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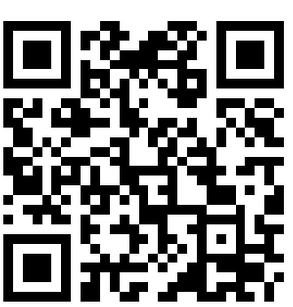

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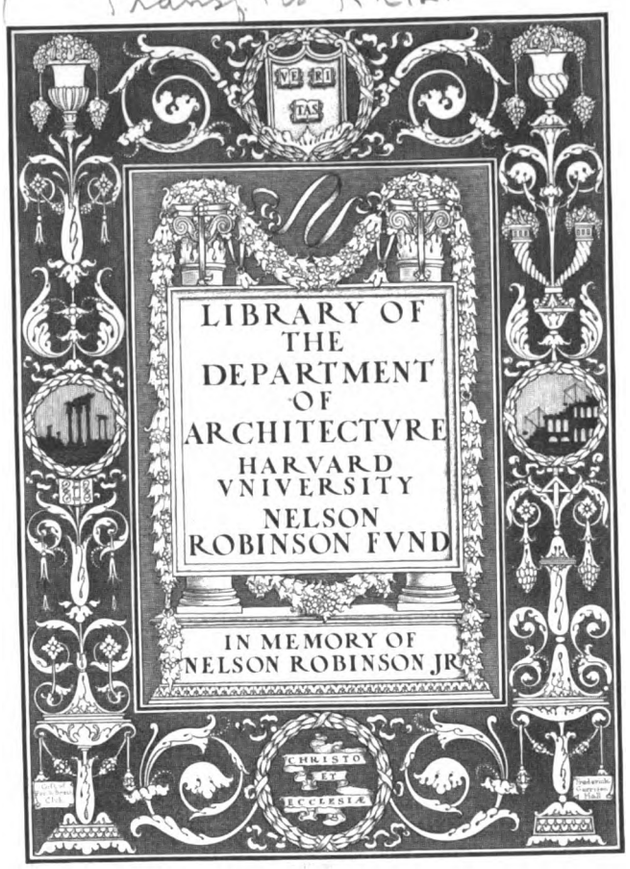

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JAN.TO JVNE 1902

THE BVILDER

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THE BUILDER

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Municipal Control of Town Architecture.

THE Ulster Society of Architects have been much and not unreasonably disturbed by a threatened new departure of the Belfast Corporation, in their proposed new Bill, in regard to the regulation of the city architecture by the authorities. This consists in the demand that every one who proposes to erect or alter the front wall of any building shall, in addition to the plan, section, and notice which are required by the existing local Acts of the Corporation to be lodged with the City Surveyor, also lodge, in the same manner and subject to the conditions prescribed by the Local Acts, a drawing or drawings showing all the elevations of the building overlooking any street or streets. These elevations are to show the height, character, and design of the building, and the height of any buildings immediately adjoining it on either side; and on the drawings is to be a statement of the materials proposed to be used.

This provision is contained in Clause 11 of Part V. of the Belfast Corporation Bill ; and the clause proceeds as follows :—

"2. The Corporation may disapprove of such elevations on the ground that the same are in their opinion objectionable or that in any respect they are not in conformity with the requirements or provisions of the existing Local Acts or by-laws of the Corporation.

3. The provisions of the said Local Acts and By-laws shall so far as applicable for the purpose of and not varied by or inconsistent with the provisions of this Section apply *mutatis mutandis* to the matters referred to in this Section.

Any person aggrieved by a decision of the Corporation as to such elevations, may appeal to the Recorder against such decision, whose decision thereon must be final."

Paragraph (2) has since been modified in wording by substituting for the "Corporation may disapprove," "the Surveyor may disapprove," and in paragraph (3) "any person aggrieved by the decision of the Surveyor." This appears to be nominally putting more power into the hands of the Surveyor, though it is much the same thing in reality, as the Corporation would in any case be guided by the Surveyor in such a matter, and their objection would be practically his objection. One is not surprised however, that the architects of Belfast and the neighbourhood should think this a still more offensive and objectionable way of putting the matter, since it places the Surveyor, who may be a quite interior person in an architectural sense, in the position of a judge over their designs, and the only appeal from his decision is to the Recorder, who is not an architect, and may in all probability know nothing at all about the subject.

It is not quite apparent what the Belfast Corporation are really aiming at in bringing forward this measure. There is no doubt that the wording of it would give them power to object to an elevation solely on the score that they (or their Surveyor) did not fancy the design, which would be an intolerable and most mischievous power to have, if it were in contemplation to exercise it to any considerable extent, or to endeavour to impose the taste of their Surveyor upon architects who may be far his superiors in artistic perception. It may, however, be only intended as a means of obtaining power to stop an outrageously bad design, such as would spoil a street in which there were already buildings of a superior architectural class : and if that were all, there is no doubt that there are instances in which the possession of such a power, and its practical operation, might be exceedingly beneficial. It really all depends on the spirit in which the regulation is intended, and the tribunal which is to decide.

The Ulster Society of Architects have obtained a counsel's opinion on this feature in the Belfast Corporation Bill, in which the learned counsel states that the promise to consider any proposed modifications of the clauses objected to was nothing to the purpose, as the whole principle is wrong :—

"In my opinion it would be impossible to frame any alternative clauses such as could, or ought to be formulated, or even sanctioned, by the Ulster Society of Architects, or by any one interested in the advancement of architecture, and especially by all companies or traders desirous of spending money in Belfast, either on the improvement of their old, or the erection of new buildings within the city of Belfast. If it were merely in form that these clauses were objectionable, then alternative ones might be substituted, but the object of part V. and the principles on which it rests are inherently faulty, and unprecedented in legislation. . . . . The object of the proposed clauses is presumably to

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obtain uniformity of architecture in the city of Belfast, and that object is sought to be obtained by establishing an autocratic censorship in matters of artistic taste, on which the most divergent and fanciful ideas which (*sic*), from the nature of things, must always exist among a body of self-constituted censors.

Such a censorship could not but be injurious and intolerable to the profession of architects by killing all attempt at original architectural design in Belfast, and must of necessity interfere with the immemorial rights of private property and individual enterprise."

Now to say that such a demand is unprecedented is a mistake. It may be unprecedented in England, but if the Ulster Society and their Counsel look to Paris—a city renowned for the generally high style of its street architecture—they will find that in Paris the elevation of every new building has to be submitted to the Prefecture of the Seine, as well as plans and sections. It is true that it does not appear that it is a main object to sanction or object to the elevations in regard to their architectural design: the main object is the question of height, and area of internal courts, and construction; but there is no doubt that the Prefecture could, and would if it thought necessary in any particular case, refuse to sanction the elevation on the point of design, though we do not suppose this is often done. Again, in the case of a square or a terrace which has been symmetrically designed so as to be one architectural whole—as in the Place Vendôme, the Place de la Concorde, the Rond-point of the Champs Elysées &c.—the Paris by-laws give the Municipality the power to prevent any owner from altering or rebuilding his own front so as to interfere with the main design. Had we possessed this power in London, we should not, or at least need not, have seen the symmetrical design of Regent-street and the two circuses entirely destroyed as they have been by the caprice of private owners running up their fronts beyond the main line of cornice, and introducing architectural designs entirely at variance with the general design.

Those, therefore, who say that the power sought by the Belfast Corporation is without precedent have not looked beyond our own shores, or they would have seen precedent enough. The real complaint is against the unsatisfactory nature of the authority proposed. In Paris the decision rests with a committee which includes the architects who are officially attached to the Corporation; not one surveyor, who may be a man of little or no architectural perception, but several architects, who are men of position and standing. This matter of the tribunal is an obvious defect in the Belfast proposals; to give the City Surveyor power to sit in judgment on an architectural design, and to leave no better appeal from his judgment than to an official probably possessed of no architectural knowledge whatever, is a position against which we cannot wonder that the Ulster architects are up in arms. But it does not follow that the principle is altogether wrong. We admit that at the best it is a very difficult subject, and that much may be said on both sides; but the fact remains that in cities where more attention is paid to architecture than in most or any of our English cities, the power which the Belfast Corporation are seeking to have does exist, and that in our own capital city mischief has been done to our street architecture in some instances which might and ought to have been prevented, had we possessed any power of exercising a veto upon a design on purely architectural grounds, instead of merely controlling the practical questions of height, and frontage line, and materials of construction. No doubt such a power, if possessed by a Municipal Authority, ought to be exercised with great caution, and rather in a negative than a positive sense; not to favour any particular style, but to prevent the intrusion of any design manifestly beneath the general architectural character of a street, or at variance with its general design where such exists. The kind of tribunal proposed by the Belfast Corporation is no doubt most objectionable; but the architects have been rather too hasty in concluding that the existence of any controlling power at all must be an unmixed evil. It is a question not so easily settled, and deserving at all events careful consideration.

SIR WILLIAM CHAMBERS.

IT is the good fortune of Sir William Chambers that his largest and most important work is one of the best-known, most conspicuous, and most effectively-placed public buildings in London, enjoying the glory of a river frontage (somewhat shorn of its original effect by the subsequent intrusion of the Thames Embankment at its base), and in the immediate vicinity of one of the grandest of bridges, which groups admirably with the long level lines of its façade. Chambers therefore ought to have a name and fame among Londoners; though it may be doubted whether one in a thousand of those who cross Waterloo Bridge every day in the face of Somerset House could give the name of its architect; so little does architectural reputation count for in this country.

Among architects, and those who specially concern themselves with architecture, there has been a feeling of coldness towards Chambers and his school of late years; we have had Somerset House spoken of, by some modern writers on architecture, professional and lay, in a tone of depreciation with which we have no sympathy, and which we consider not in the least justified. It must be admitted, however, that Chambers was not an architectural genius to be classed with such men as Inigo Jones, Wren, Vanbrugh, Hawksmoor, and Barry. He was something of a pedant; a man who designed by rule rather than by instinct. But he is one of the best representatives of a school of architecture which was important in its day and generation—the school which based its work on the Orders as laid down and illustrated by the great Italian Renaissance architects; from his own point of view he was an arduous and earnest student of his art, and spared no pains either in study or in turning his studies to practical account in his designs; and in spite of the conventional toils of academical rule by which he was hampered, he sought and obtained a certain degree of originality both in general design and detail.

Chambers, though of English parentage, was born in Stockholm about 1726 (the precise date seems uncertain), where his father had gone in order to endeavour to gain redress for commercial losses which he had suffered in supplying Charles XII. with money and stores—losses said to have been owing to the depreciation of the coinage in which his house had been paid. The father therefore, was evidently a mercantile man of considerable means and importance, or he could not, in Dogberry's phrase, have "had losses" on so large a scale as to make it worth his while to leave England and take up a residence of two or three years in Sweden in the hope of recovering them. He returned to England in 1728, whether successful or not in his mission is not recorded. His son William was evidently intended to follow a commercial career, and at the early age of sixteen was appointed supercargo in a ship belonging to the Swedish East India Company, which made a voyage to Canton; and here the bent of his mind first manifested itself in the attention which he gave to the specimens of Chinese architecture around him, of which, having already some proficiency in drawing, he made a sufficient number of sketches to form subsequently the foundation of a small essay, with a collection of plates, on the architecture of the Chinese, published in 1757, after he had become established in architectural practice in London. How far the drawings in their published form are to be relied on seems rather doubtful, for he admits that it was almost impossible to make measurements, the Chinese being, as he describes them, a suspicious and ill-mannered generation, who, if they saw a European measuring on their buildings, were "apt to throw stones at him" and otherwise insult him; but the buildings figured are nevertheless all precisely drawn out in plan and elevation, in that hard, mechanical style of line shading with which we are familiar in the plates of the "Vitruvius Britannicus" and other eighteenth century architectural publications. Had he been content to copy his sketches, as sketches, his book would probably have had much more real value than it has at this moment; but there was at that time an established form for architectural publications, which as a matter of professional dignity must be adhered to, whether the materials for it really existed or not. To have published a book of sketches taken on the spot would have been to derogate; and the mere fact of publishing a book on Chinese architecture seems to have been regarded by Chambers's friends, if not by himself, as somewhat of a scandal to a properly educated architect. His defence of it in his preface is amusing in its way, touched as it is with certain dry sarcastic humour which crops out in all his writings from time to time:—

"Several of my good friends have endeavoured to dissuade me from publishing this book, through a persuasion that it would hurt my reputation as an architect; and I pay so much deference to this opinion that I should certainly have desisted, had it not been too far advanced before I knew their sentiments; yet I cannot conceive why it should be criminal in a traveller to give an account of what he has seen worthy of notice in China, any more than in Italy, France, or any other country; nor did I think it possible that any man should be so void of reason as to infer that an architect is ignorant of his profession, merely from his having published designs of Chinese buildings."

The argument would certainly hold good now; but in the days when all architecture was supposed to be mainly concerned in the designing and the use of the classic Orders, it may very well be imagined that an architect who published illustrations of Chinese architecture would have been regarded with

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doubt, as a person who had neglected the weightier matters of the law for mere frivolities. And it may be said that the fact of his having given his first definite attention to architecture in its Chinese forms was not altogether beneficial to him, leading him rather to exaggerate the importance of the subject, and leaving behind it a certain taste for gimcrack effects which came to life again and asserted itself now and then, as in some of his designs for Kew Gardens in later days.

This first Chinese escapade, however, was soon supplanted, as far as study was concerned, by the orthodox tour in Italy and a careful study not so much of the works of antiquity as of the buildings of the most famous Renaissance architects—those of Michaelangelo, Sangallo, Palladio, Scamozzi, Vignola, Peruzzi, San Michele, and Bernini. According to his pupil and biographer Hardwicke, he selected these works for special study, rather than the remains of ancient Rome, as representing the work of men "whose designs were generally guided by the rules of the ancients, but whose extraordinary talents, exalting them above the character of mere imitators, produced an originality in their compositions that fully established their fame, and pointed them out as the fittest models for succeeding artists." In this estimation as to the essential originality of the leading architects of the Italian Renaissance, in spite of their reverence for the antique and for the rules of Vitruvius, Chambers and Hardwicke were perfectly right. To call the men of the Italian Renaissance merely scholastic architects is to do them quite an injustice, and to fly in the face of obvious facts; it is true that they were greatly under the influence of a reverence for Roman precedent, and that their details were all based at least on that; but they in many cases showed themselves as original thinkers in architecture, and made new and effective combinations out of the old materials. Chambers was well advised in thinking that they were more of artists than the Roman architects from whom they drew their inspiration. On the other hand, while perhaps judging rightly of Roman architecture, he appears to have been totally ignorant of Greek architecture, and to have set it down, without even taking the trouble to become acquainted with it, as an architecture inferior both to that of the Romans and the revivalists, even to the extraordinary mistake of supposing that Greek mouldings and detail were commonplace and wanting in refinement in comparison with Roman work.

His opinions on these points are embodied in his rather remarkable treatise on "The Decorative Part of Civil Architecture," first published in 1759 under the shorter and more comprehensive title "A Treatise on Civil Architecture"; and re-issued in a second edition in 1768, and in its third and final form in 1791, when the title was altered as above noted, in consequence of the fact that he had not found time to prepare a section going into the constructive side of architecture, and therefore adopted a title more precisely expressing the limits of the work.

It may be said that the "Treatise" and Somerset House form Chambers's two principal claims to distinction, and the Treatise is therefore worth some special consideration. It is the best, perhaps the only work written originally in English, in which architecture is fully and thoughtfully considered from the point of view which regards it solely as the application to buildings of classic orders and detail, and is a work still of importance to those who are going through the study of that phase of architecture. The author thoroughly understands his subject, and writes for the most part the lucid and polished English of a well-educated man, and his critical opinions are diversified occasionally by a certain quiet and half-satirical humour. His description of what an architect should be is characteristic of the man. Demurring to the tremendous list of qualifications so pedantically enumerated by Vitruvius, which he dismisses as impossible (in the spirit of Rasselas—"thou hast convinced me that no human being can ever be a poet"), he nevertheless lays it down in his "Introduction" that the architect must be a man superior both in acquired and natural gifts, "architecture being an active as well as a speculative art, the organs of sense and utterance are equally necessary with efforts of the mind; it naturally follows that such as intend to make it their profession, should enter the lists with a good stock of health, vigour, and agility; they should neither be lame nor unwieldy; neither awkward, slow, nor helpless; neither purblind nor deaf; nor have anything ridiculous about them, either natural or acquired." It is amusing to compare this opinion, which pretty plainly intimates Chambers's conviction of his own completeness in these respects, with the reason given by Allan Cunningham for his appointment, in his early days, to be tutor in architecture to the then Prince of Wales (George III.); the Earl of Bute, who had the matter in hand, being informed that not only was Chambers very skilful, but also that "his person and manner were not only unexceptionable, but inviting"—he was a fit person, in short, to be about a Court and to instruct a Prince; and there seems little reason to doubt that Chambers owed some at least of his professional success to his agreeable personality and manners. His sketch of the subjects with which an architect should be acquainted, and the range of his studies, is a reasonable and sensible one, tolerably extensive it is true, and beyond the powers or the opportunities of many, but not including anything which is not really of value in the practice of architecture; nor does he forget the more prosaic requirements of business-like capacity in accounts and estimating. His remarks on the advantage of travel to an artist, in stimulating his imagination, are admirably put and with a good deal of eloquence. He sums up:—

"By travelling, a thorough knowledge of different countries, their language and manners, are alone to be attained in perfection; and by conversing with men of different nations, we learn their opinions, hear their reasons in support of them, and are naturally led to reason in our turn—to set aside our prejudices, reject our ill-founded maxims, and allow for granted only that which is clearly approved, or is founded on reason, long experience, and careful observation."

From the Introduction we pass to the "Origin and Progress of Building," which includes much the kind of half imaginary but not improbable sketch of the use of the habitation which is to be found among other writers on what may be called the philosophy of architecture; but it contains passages in which, as the author says at the close, he "has ventured to think for himself." While uttering the very questionable dictum that "the antique is to the architect what nature is to the painter—the source from which his chief knowledge must be collected, the model upon which his taste must be formed," he is careful to rebuke that "blind adoration of antiquity" which finds everything done by the Romans a fit model for imitation—"in Rome, as in London or Paris, there were a few great architects, but many indifferent ones"; and he goes on to say, with truth enough, that in the constructive part of architecture the ancients do not seem to have been great proficients, and that the strength and duration of the Roman buildings is more due to the quantity and goodness of their materials than to any great art in putting them together. This is true enough, but it is amusing to read in another paragraph that "many of the deformities observable in the Grecian buildings must be ascribed to their deficiency in that particular [constructive skill], such as their gouty columns, their narrow intercolumniations, their disproportionate architraves," &c. Chambers had never seen the remains of a Grecian building *in situ;* there were no photographs in those days, and up to his time, as far as we know, no good or reliable drawings of Greek work,* so that it is difficult to understand on what he relied in uttering this very decisive opinion; he must have been speaking entirely in the dark. But his remarks upon Gothic, where he had the acquaintance of the actual buildings, show much more insight and breadth of view:—

"To those usually called Gothic architects we are indebted for the first considerable improvements in construction; there is a lightness in their works, an art and boldness of execution, to which the ancients never arrived, and which the moderns comprehend and imitate with difficulty. . . . One cannot refrain from wishing that the Gothic structures were more considered, better understood, and in higher estimation, than they hitherto seem to have been. Would our dilettanti, instead of importing the gleanings of Greece—or our antiquaries, instead of publishing loose incoherent prints, encourage persons duly qualified to undertake a correct elegant publication of our own cathedrals and other buildings called Gothic, before they totally fall to ruin, it would be of real service to the arts of design, preserve the remembrance of an extraordinary style of building now sinking fast into oblivion, and at the same time publish to the world the riches of Britain in the splendour of her ancient structures."

These are remarkable words to have been written by an eighteenth-century architect; and in this respect at least Chambers was far in advance of his time. He would have been surprised indeed could he have known

* "Stuart and Revett" had not appeared when the first edition of the "Treatise" was published, though it had appeared before the third edition. The Institute library does not possess the first edition of the "Treatise," and we have not been able to see it elsewhere, so we cannot say whether these remarks were included in the first edition. The following passage looks almost as if it were an insertion in the later edition, prompted by the publication of Stuart and Revett's book:—

"Indeed, none of the few things now existing in Greece, though so pompously described, and neatly represented, in various publications of our time, seem to deserve great notice, either for dimension, grandeur of style, rich fancy, or elegant taste of design; nor do they seem calculated to throw new light upon the art, or to contribute towards its advancement; not even those erected by Pericles or Alexander, while the Grecian arts flourished most; neither the famous lantern of Demosthenes, nor the more famous Parthenon; which, though not so considerable as the church of St. Martin, in St. Martin's-lane, exclusive of its elegant spire, had for its architects Phidias, Callicrates, and Ictinus; was the boast of Athens; excited the envy and murmurs of all Greece."

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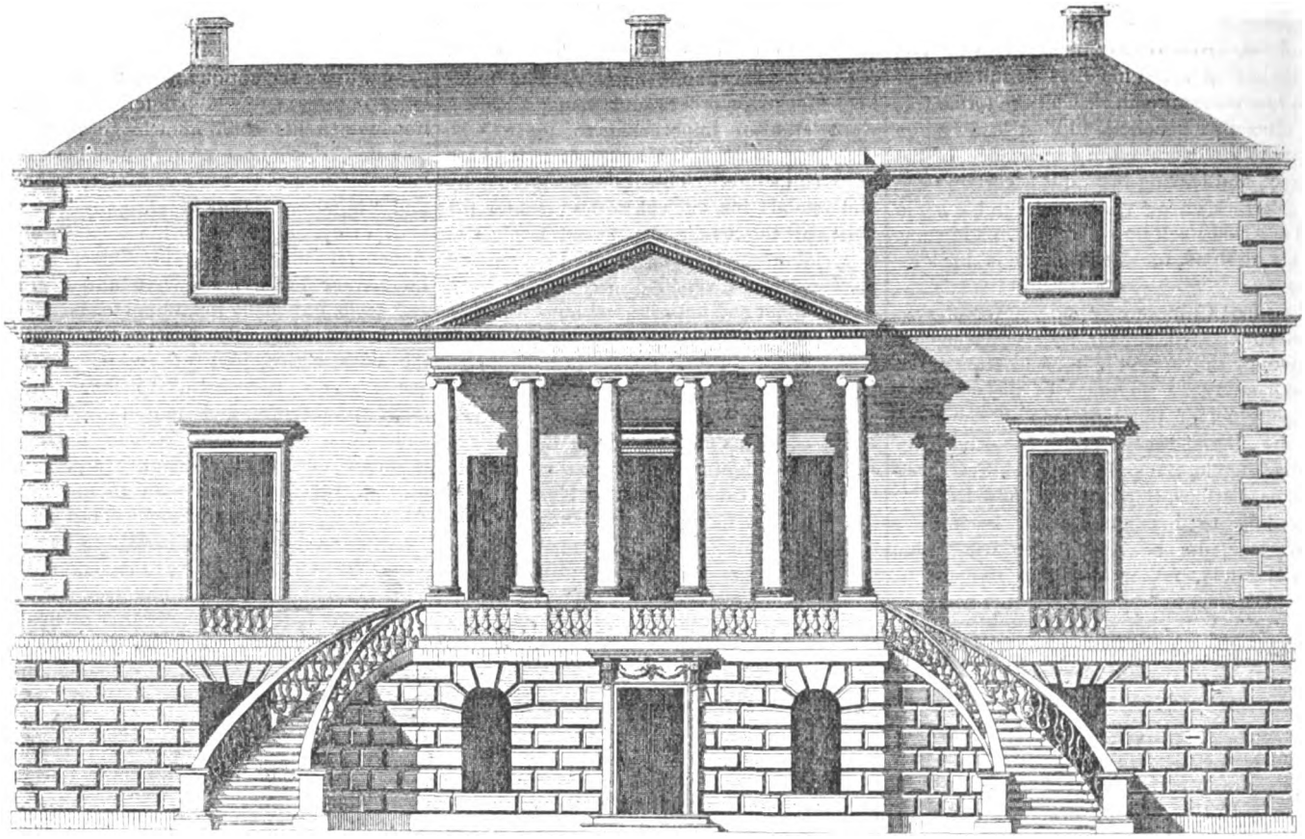

Fig. 1.—Elevation of Villa, Rochampton.

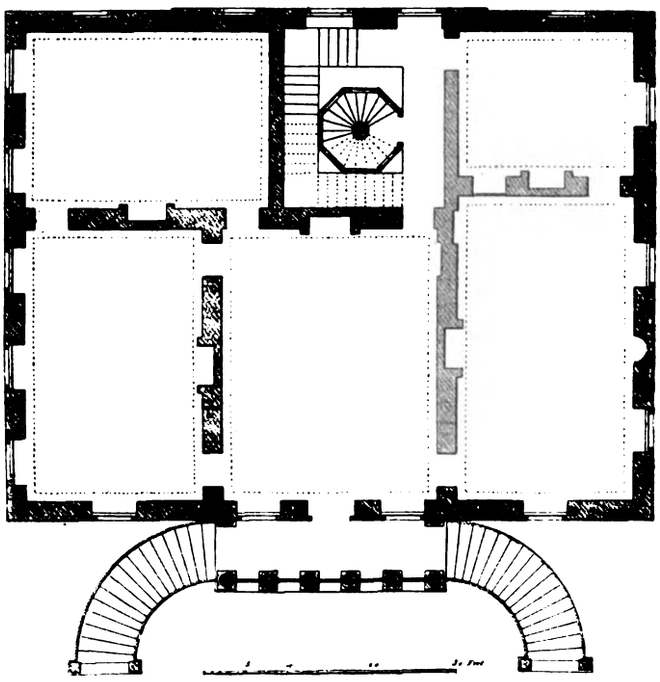

Fig. 2.—Plan of Villa, Roehampton.

how more than completely his aspirations were to be fulfilled in the following century.

In the chapter on "The Parts which Compose the Orders of Architecture" we have the usual description of the recognised mouldings of the Classic school, but Chambers shows a certain discrimination in grouping them into two types, those which originally represented necessary portions of the structure, such as mutules, modillions, and dentils, and those which are purely ornamental; a division of the subject certainly useful to a student, as inviting him to a consideration of the thought and intention which no doubt originally lay beneath forms which have since been employed rather by rote and habit than by any consideration of their function in reference to architectural expression. We cannot follow him through his analysis of the various Orders, which from the "Orders" point of view of architecture is, however, exceedingly well done, and renders this treatise one of the best that the student can take in hand in going through the subject. Here and there, however, we come upon an original remark worth noting. For instance, after describing the care with which he had himself studied and measured the best Roman and Renaissance examples in regard to the proportions of their parts, he continues:—

"Sensible he is that the extraordinary degree of accuracy which has been aimed at in these compositions is of little consequence to the generality of spectators, who see in the gross and feel by the lump. Nevertheless, as in poesy, music, painting, and indeed all arts, there are delicacies which, though they escape the vulgar notice, afford uncommon pleasure to persons of enlightened conception, so in architecture this kind of perfection is the source of secondary pleasures less forcible perhaps, but not always less delightful than the first."

This is very well put, and represents the essential distinction between the learned and the unlearned perception of architectural detail. There are some good critical remarks in the chapter on pilasters, though he starts with showing that he totally misunderstands the object and function of the Greek *antæ*, which were not supposed to be pilasters in the Roman sense, but projections of the *cella* wall treated so as to make a kind of "answer" to the column; he complains of the fact that "neither their bases nor their capitals bore any resemblance to those of the columns they accompanied," not seeing that this was just a characteristic Greek refinement of architectural expression, to distinguish the *antæ* as different objects from a column, with a different function. In his chapter on "Intercolumniations" he quotes Blondel to the effect that when colonnades are composed of more than one row of columns, they should not be of circular or polygonal figures, because the true disposition of the columns is in that case only seen from the centre of the figure (he means the centre of the circle from which the curve of the supposed colonnade is struck); and Chambers supports it with the words—"This remark is very just. I have frequently observed and regretted the bad effect of a

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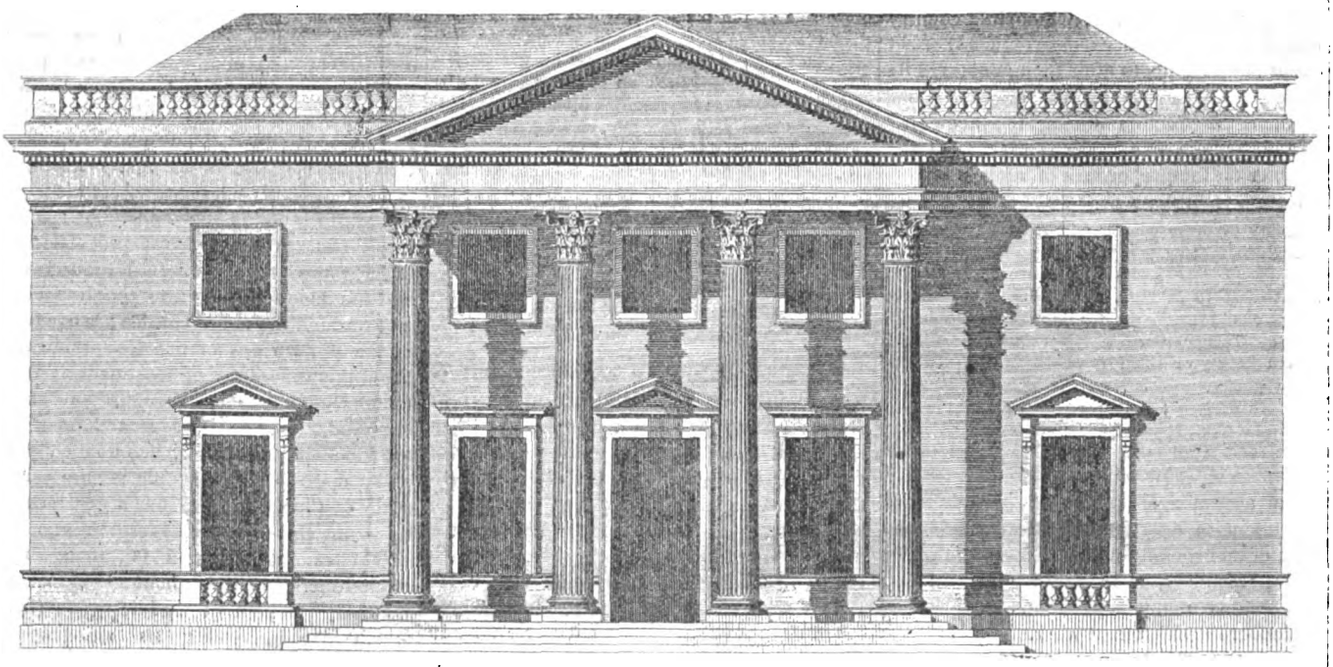

Fig. 3.—Elevation of Duddingstone House.

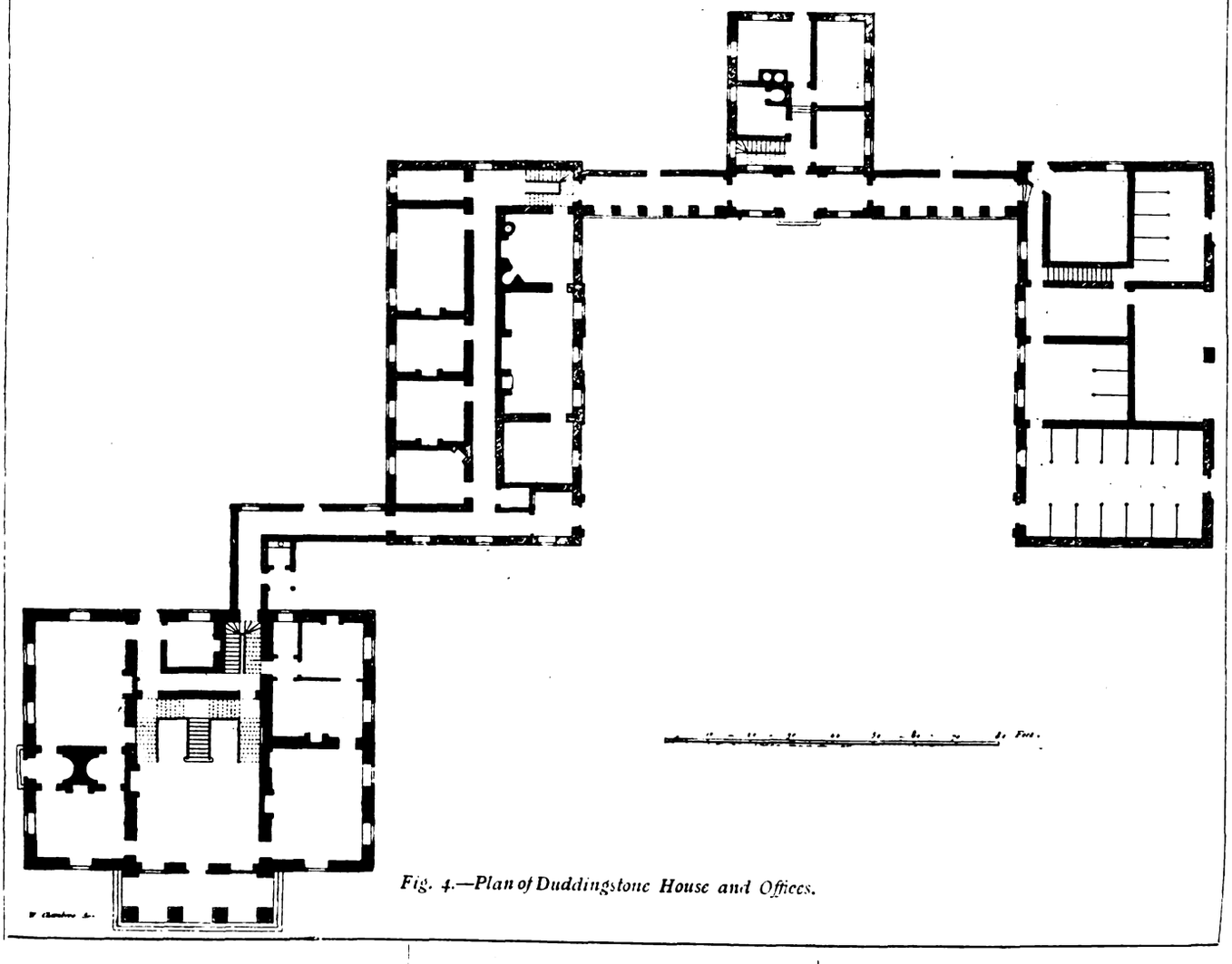

Fig. 4.—Plan of Duddingstone House and Offices.

circular disposition in the above-mentioned magnificent structure [Bernini's colonnade at St. Peter's], where the four ranges of columns of which the colonnades are composed offer nothing but confusion to the spectator's eye from every point of view." This is a curious example of the Renaissance passion for neatness and symmetry in architectural disposition, which was peculiarly developed in Chambers's mind; he could not bear anything irregular or "incorrect." Yet we may ask, is not that very "confusion" which, as he says, results from the employment of colonnades of two or three deep in a circular peristyle, exactly an element of picturesque effect in architecture? Bernini had great faults, but in his way he was certainly more of a genius than Chambers, and could soar to something higher than orderliness.

Among the chapters on gates, doors, windows, and other portions of buildings, there is a good deal of really good criticism and suggestion mixed up with rules and regulations which are purely academical. It is amusing to notice, after the author's condemnation, from the point of view of design, of doors with sloping jambs, and narrower at the top than at the bottom, the remark as to one valuable property which they possess—

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'They shut themselves; which, in a country where neither man nor woman takes thought about shutting doors after them, deserves its praise, and was perhaps, the original cause o their introduction among the ancients." We may quote one other remark, from the hapter on the proportions of rooms :—

"The coldness of our English climate, and the frugality of those who build, are strong objections to high rooms; so that we frequently see the most magnificent apartments not above 15 ft., 16 ft., or at most 18 ft. high, though the extent of the rooms would require a much more considerable elevation. This practice is however not to be imitated, where beauty or effect is aimed at. There are many good expedients for warming rooms, however spacious or lofty; and to consider expense in that particular alone is an ill-judged piece of parsimony, as it renders all other expense employed in the decoration of the room ineffectual."

This appeal against the mean and timid treatment of apartments of State, under the plea of an economy which renders the whole thing worthless, is in the best spirit, and might have many applications in reference to modern architectural work.

On the whole, we may regard the "Treatise on the Decorative Part of Civil Architecture" as a monumental production of its time and of its class, highly creditable to its author when we consider it with reference to the period at which it was written and the ideas in regard to the art of architecture which were then prevalent. The author at all events understood the subject thoroughly from his own point of view, and many of his critical remarks are of value as suggestions and exhortations in a sense wider than that in which they were originally intended. His remaining essay, "A Dissertation on Oriental Gardening," published in 1772, occasioned in its day a commotion quite out of keeping with its real value, and in fact we believe was misunderstood both in the writer's own day and by some of his more recent biographers and commentators. We take it that with the exception of the preface, which is in earnest enough, the book was really a solemn joke, partly satirical, partly intended to mystify the public. It was obviously prompted to a considerable extent by a personal feeling against "Capability Brown," who had obtained the commission for laying out an important estate which Chambers would have liked to have laid out, and in which he would unquestionably have done much better. It is this which gives point to the following sarcastic description of the "English garden" of his day—a description little exaggerated, as we know from other records of Brown's method of dealing with the surroundings of a house :—

"Our gardens differ very little from common fields, so closely is common nature copied in most of them. There is generally so little variety in the objects, such a poverty of imagination in the contrivance, and of art in the arrangement, that these compositions rather appear the offspring of chance than design, and a stranger is often at a loss to know whether he is walking in a meadow or in a pleasure-ground, made and kept at a considerable expence. He sees nothing to amuse him, nothing to excite his curiosity, nor anything to keep up his attention. At his first entrance, he is treated with the sight of a large green field, scattered over with a few straggling trees, and verged with a confused border of little shrubs and flowers; after further inspection, he finds a little serpentine path, twining in regular esses (*sic*) among the shrubs of the border, upon which he is to go round, to look on one side at what he has already seen—the large green field, and on the other side at the boundary, which is never more than a few yards from him and always obtruding upon his sight; from time to time he perceives a little seat or temple stuck up against the wall; he rejoices at the discovery, sits down, rests his wearied limbs, and then reels on again, cursing the line of beauty; till spent with fatigue, nearly roasted by the sun, for there is never any shade, and tired for want of entertainment, he resolves to see no more; vain resolution! There is but one path; he must either drag on to the end, or return back by the same tedious way he came. Such is the favourite plan of all our smaller gardens, and our larger works are only a repetition of the smaller ones; more green fields, more shrubberies, more serpentine walks, and more seats."

There is evidently a certain amount of temper in this satirical description; *fecit indignatio versum;* but it was pretty true in the main. The description, in the body of the treatise, of what the Chinese did with their gardens, is obvious and intentional hyberbole, and in some passages there is a satirical intention of another kind, which seems also to have been missed: *e.g.*, "it is not in China as in Italy and France, where every petty architect is a gardener . . . . in China gardening is a distinct profession," &c. Considering that Chambers had elsewhere complained of Brown or some other landscape gardener encroaching on what is properly the architect's work, it is obvious that this is really meant to point at a country where "every petty gardener is an architect"; but his satire was evidently not taken, and his hyperbole on the other hand was taken for earnest, and made the subject of a satire in a mock-heroic poem by one MacGregor, which seems to have attracted immense attention at the time, but has no value now but for the fact that one peculiarly malicious couplet in it has the honour of citation in Boswell's "Life of Johnson."*

Turning from these rather unprofitable and forgotten literary excursions to Chambers's architecture, we may first mention two of his houses which are especially celebrated and especially characteristic of the architectural taste of their time; the "Villa" (so-called) at Roehampton, built for the Earl of Besborough, and the mansion at Duddingstone near Edinburgh, originally built for the Earl of Abercorn. They are almost exactly the same size; Duddingstone has about 5 ft. longer frontage than the other; and both represent the type of house which consists externally of a nearly plain cube of building, diversified only by a columned and pedimented portico in the centre of the principal front. There is this important distinction between them, however, that at Duddingstone the principal floor is the ground floor, raised by only a few steps above the ground level; at Roehampton the principal floor is the first floor, approached from without by those double curved stone staircases which are so charming a feature in many an eighteenth-century house, and the beauty of which ought in our opinion to far outweigh the supposed inconvenience which modern notions of comfort and accessibility discover in them. It is perhaps this difference of treatment which made Roehampton, in the dialect of the time, a "Villa," while Duddingstone is a house. Roehampton, the earliest of the two, is by far the more pleasing externally. We give a reproduction of the elevation (fig. 1) from the "Vitruvius Britannicus"; and in spite of its prim formality, emphasised yet more by the mechanical line engraving of the period, it is impossible not to be struck with its singularly harmonious balance of parts and proportions. The plan, which we also give (fig. 2), is simplicity itself; the manner in which the servants' stair is worked inside the other is ingenious. At Duddingstone (fig. 3) the general proportions are lower, there is no rusticated ground story, and the pediment cuts into the line of roof and through the main cornice; the columns of the portico are of the Corinthian order. From this difference of treatment it results that Duddingstone, though, as already observed, only a few feet longer than the Roehampton house, has a much larger and more dignified air; the larger scale of the Order also has a great deal to do with this; at Roehampton the total height of the columns is about 13 ft., at Duddingstone it is about 27 ft. We give the complete plan of Duddingstone (fig. 4), which is interesting as showing the manner in which the offices and stables are planned, and connected to the house. At Duddingstone the staircase is made a prominent feature in the central hall (*see* plate), treated in a stately manner with symmetrical flights rising right and left from the single lower flight; another point which greatly emphasises the difference in character between the two houses. Both in plan and design, in fact, these two houses are very good examples of the manner in which the character and scale of two buildings which in mere measurement are of very nearly the same size, may be rendered completely different in effect by the nature of the architectural treatment. We give an illustration also of one of the fireplaces from Duddingstone (*see* plate), an example of a somewhat fanciful treatment of classic materials which shows how Chambers could exercise his own individuality in the design of ornamental detail.

The front of Trinity College, Dublin, shown in one of our plates, exhibits the same kind of architectural idea as these two houses; a central colonnade supporting a pediment, with plain masses on each side, in this case terminated at the ends by pavilions with a pilaster order. This though dignified, is not a very recondite type of architecture; but the "Marino" at Clontarf, of which we also give an illustration, is a peculiarly good specimen of Chambers's quality as an architect; being an essentially ornamental type of building, it is exactly the thing for an architect to deal with whose *forte* lay in decorative application of the orders, and it is an exceedingly harmonious and dignified piece of modern Classic architecture. The preparation of designs for the various erections, also largely ornamental, for Kew Gardens, should have also have been a type of work to bring out Chambers's best qualities; but their interest is a good deal weakened by the fact that they are to a great extent sham constructions; imitations of masonic structure in more perishable materials. The best among them is the often-illustrated "Temple of the Sun," which has the merit of distinct originality as well as elegance. The design for the entrance gateway to the forecourt of the house which was afterwards the Albany (*see*

* "Witness ye Hills, ye Johnsons, Scots, Shebbeares,
Hark to my call, for *some* of you have ears:"
a brutal allusion to the mutilation occasionally attendant on punishment in the pillory.

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plate) is a really picturesque piece of work of its kind, and the iron railing accompanying it shows that Chambers had considerable feeling for design of this class; his railings are novel and graceful in treatment. Among the Soane Museum drawings is a large one for a remarkably fine iron lamp standard designed for execution in connexion with Somerset House—it is included at least in a portfolio of Somerset House drawings, and is a most meritorious piece of decorative work for its time.

But Chambers's real title to fame as an architect is bound up with Somerset House, but for which he would hardly be much remembered except as the author of the "Treatise on Civil Architecture." It was an extraordinary piece of good fortune that towards the latter end of his professional life, in 1775, after having been occupied mainly in scattered works of no great magnitude, Chambers should have received the commission to carry out a Government building on a great scale and on a site so remarkably prominent and so calculated for architectural effect. And Chambers did well with his opportunities. However we may find the building to be what may be called somewhat *hard* in detail, wanting that modelled effect which Inigo Jones or Hawksmoor would have known how to give to it, the river front, with its powerful rusticated and arched terrace wall as a base, and the more refined and delicate architecture of the main building rising above it, is an exceedingly fine piece of architectural scenery; and the idea of making the great central block and the ends of the two side wings all one façade towards the river, connecting them architecturally and yet marking the actual disconnexion between them by those picturesque open colonnaded bays, comes nearer being a stroke of real genius (if indeed it does not deserve to be called so) than anything else Chambers ever did. We have given an illustration, made specially for this issue by Mr. W. Monk, of the appearance of the river front before the making of the Thames Embankment, which, however great an engineering work in itself, has much injured the effect of Somerset House. The Strand front, it must be admitted, is tamer than this, and more in Chambers's ordinary and rather conventional style. The effect of the quadrangle is hardly all that it might have been made, and it is not improved by those weak-looking square clock turrets on the east and west sides, which almost look like subsequent additions by another hand; they are, however, shown in an apparently contemporary perspective view in the Soane Museum. The carriage gateway from the Strand, with its coupled columns, is a peculiarly elegant bit of academical architecture of its kind, and the vestibules opening right and left, with their circular staircases, must have had an admirable effect when intact. It is melancholy to see these, as well as the large vestibule of the navy office in the centre of the south block, cut up into offices and deprived of all their intended effect, simply for the sake of economising space. In some countries, at all events, a building by an eminent architect would not have been allowed to be spoiled in this way, for no better reason than a miserable economy.

There is much more in Somerset House than outward architectural display, for the site was a most difficult one to deal with, partly on a declivity and partly on the actual bed of the river, occasioning an immense expenditure of work in foundations, the actual and practicable sub-structure of the building extending far down below the level of the court-yard. In his Report on the progress of the work delivered in May, 1780, Chambers says:—

"The work is all faced with stone, is built of the best materials in the most substantial manner possible, and set on brick foundations, a great part of them laid in the bed of the river, with various expensive but necessary precautions, and others sunk through loose made ground, 10, 12, and even 16 ft. deep. The greatest part of the vaults too, surrounding the area of this large quadrangle, are turned, as also a great part of the cross passage of communication from the areas on one side to those on the other, which are all built of hard Grey-stocks, with stone plinths necessarily set in most parts on very deep brick foundations."

It is not surprising that with all this work swallowed up in foundations, the building should, even in those days, have cost half-a-million to complete.

Taking into consideration his successful dealing with the practical difficulties of the site, and his fine treatment of the river front, it may be said that in this building Chambers showed himself a true and all-round architect, combining the qualities of the engineer and the artist; and that the result, if not in the highest sense a great building, is a very fine work of architecture, of which London may well be proud, and for which the name of its architect should be had in perpetual honour.

NOTES.

Royal Commission on Coal Supplies.

A ROYAL Commission has just been appointed to inquire into the question of the coal supplies of the United Kingdom. One of the terms of reference is to "inquire into the extent and available resources of the coalfields of the Kingdom." Whilst we agree that some of the other points referred to the committee are very good in their way, we do not see that the "extent and available resources" need much further elucidation. What is the Geological Survey for, if it has not already particulars concerning these matters at its command? It is quite certain that any evidence taken in regard to this aspect of the inquiry will come directly from the Survey Office, and the geological world has been in possession of as much information as can be positively given, for some time. It is a matter of common knowledge with the majority of those who take an interest in our mineral resources, as to the approximate quantity of coal available in most of our coalfields. Where the seams have a high dip, and extend at great depths underground, or pass from a "basin" under a great thickness of overlying rocks, and are "lost," or are of problematical occurrence only, the facts are sufficiently well-known to have enabled the Geological Survey Office to have given an account of them without requiring a Royal Commission to bring the particulars to light. Indeed, we believe that such information has already been furnished to Government Departments from time to time. Other terms of reference are as to the rate of exhaustion, and here the Commissioners are required to be prophets; the effect of our exports of coal on the home supply; the possibility of a reduction in cost by cheaper transport, or by the avoidance of unnecessary waste in working; and whether the mining industry under existing conditions is maintaining its competitive power with the coalfields of other countries. These are, broadly speaking, the chief problems the Commissioners have to solve, and there is no doubt that we could do with some more information than we already possess concerning some of them with advantage. There is a danger, however, of the economic points being treated in a theoretical manner by the rigid application of the laws of political economy; but the Commissioners appointed are all of them well qualified to deal with the various subjects, and if they work instead of going to sleep, as most Royal Commissioners seem to do, the inquiry generally should have fruitful results.

The Electric Railway Fire.

THE fire by which four railway servants and two passengers lost their lives on the Liverpool Overhead Railway seems to have been due to very exceptional circumstances. When the train was in the tunnel at one end of the line near Dingle Station a short circuit took place in the armature of a motor in the last carriage. Apparently it was a very heavy short circuit, as every time the driver switched on to start the train the glow-lamps burned dimly. The armature of the motor ultimately caught fire, and as a gale of wind was blowing straight into the mouth of the tunnel so strongly that it was almost impossible to keep a hat on in it, the flames spread rapidly. Ten minutes after the outbreak the rear coach was well on fire, and the flames had spread to the middle coach. In the meantime all of the twenty-nine passengers had got out of the train, and most of them had walked straight to Dingle Station and got out into the street. A few stayed behind to watch the burning train, and it was amongst these that the fatalities occurred. A pile of creosoted sleepers about 20 ft. in front of the burning train caught fire, and this caused the final catastrophe. The smoke and the heated products of combustion blown fiercely down the tunnel overcame six of those struggling to escape. At the Board of Trade inquiry last week Mr. Cottrell, the engineer of the line, stated that the passengers had thirty minutes to escape from the train. During the nine years this railway has been working this is the first serious fire caused by a motor in the driver's cab. If the motor had been entirely enclosed, like a tramway motor, it could not have happened. At Dingle Station the appliances for putting out fire were numerous and in working order, but the gale and the blinding smoke rendered the gallant attempt to put out the fire ineffective. The directors are taking the precautions which the calamity proves to be necessary. The platform at the station is being rebuilt of stone, and all unnecessary timber is being eliminated from the line.

Profit Sharing by Workmen.

MR. LIVESEY'S letter in the *Times* in which he points out that profit-sharing by workmen is the best antidote for slackness in work, is undoubtedly true. The difficulty is, however, that the moment a workman becomes a partner with the master he has, to some extent, to share in the lean as well as the fat years. But it is quite certain that in some such system the masters will find

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the best solution of the difficulty which presents itself in regard to workmen doing less work than they reasonably could. So long as an artisan reaps no advantage by doing a larger amount of work in the day than he now does, so long will the present troubles exist. It has also to be borne in mind that in some trades it is comparatively easy to arrange a reasonable system. Mr. Livesey instanced the Grimsby fishermen, but in such a business little difficulty is presented. Take, however, the case of a contractor who supplies bricklayers and carpenters, and at once it becomes evident that a satisfactory system of profit sharing is not easy to carry out. But obviously it is for the masters to elaborate such a plan and place it before their workmen for acceptance. Mr. Livesey has been very successful with his gas company, and we should be glad to see him formulate a plan for some other business; the discussion of it might lead to some practical, though we fear but partial, solution of the present difficulty.

The Mond Gas Scheme.

WE have received a pamphlet entitled "A Memorandum on the Mond Gas Scheme," written by Mr. F. N. Keen, of the Middle Temple, and published by Walter King. The pamphlet consists of a summary of the principal provisions of the Mond Gas Co.'s Act, 1901, to which reference has recently been made in these columns, and of some of the matters raised in evidence before the Parliamentary Committees which dealt with the Bill. The pamphlet appears to have been impartially compiled, for the points against, as well as those in favour of, the scheme are enumerated. The Act itself contains a number of remarkable provisos, which considerably detract from the value of the permission to supply gas in the districts specified, and make it appear as though the promoters of the Bill were willing to accept almost any conditions in order to get the Bill passed, and to remove the opposition offered by the various authorities likely to be affected by the operations of the Company. It is stipulated that the Company shall not supply gas for use in private dwelling-houses, nor permit any consumer to use the gas for illuminating purposes. We consider that the powers conferred by the Mond Gas Act are either too extensive or too limited. A fair trial of the practicability of supplying cheap gas for any and every purpose to which it might be economically applied is not permitted, while permission is given to open public thoroughfares to supply large factories which are probably capable of manufacturing power gas on their own premises at as low a rate as it can be distributed from central stations. On the Continent non-luminous gas is already extensively used for lighting and heating, as well as for power purposes, and the sooner a fair trial is given to low-quality gas in this country the better. We cannot regard the Mond scheme as satisfactory, because the powers granted by the Act are very limited, and because we consider that Mond gas, of which 50 per cent. is incombustible, is of too low a quality to be suitable for general distribution. Water-gas is wholly combustible, and is of double the heating value of Mond gas, and is already being manufactured in this country at a cost of not more than 4d. per 1,000 cubic ft. This gas, either alone or in admixture with coal-gas, is suitable for incandescent lighting as well as for power purposes; and it is suitable for distribution to all classes of consumers, both domestic and industrial, provided that care be taken to prevent leakage.

The Ventilation of Buildings.

THE depth of winter may at first sight appear to be an inappropriate time in which to refer to the question of fresh air. But, as a matter of fact, it is the very time when houses of all kinds most require careful ventilation. Just now that the fresh air cure for various diseases is being carried out vigorously, we should like to have the fresh air prevention of disease more insisted on, for the same agency which can cure can equally prevent. If a sleeping apartment, for example, is properly supplied with fresh air, it will do much to keep the occupants from falling into the doctor's hands, and so having to undergo the fresh air cure—the very antithesis of previous habits. In Swiss winter health resorts, such as St. Moritz and Davos, invalids covered with rugs may be seen sitting out from morning to night—the very persons who often at home have been guarded from every breath of fresh air in their rooms. At the same time it must be admitted that draughts are disagreeable—though probably less harmful than unpleasant. But certainly we should be glad to see more interest shown by house owners and builders in regard to efficient ventilation, and the medical profession can largely assist architects by insisting, in and out of season, on the need for well-ventilated rooms. There is little encouragement to architects to suggest systems of ventilation when the public view their efforts coldly. At one London club, at least, when the autumn cleaning day arrives we are informed that the ventilators in rooms are usually found stuffed up with newspapers to prevent their action.

The late Mr. Onslow Ford.

THE death of Mr. Onslow Ford, at a comparatively early age, is a great loss both in the artistic and social sense. As a man Mr. Ford was a general favourite with those who knew him, both for his amiability and for a certain piquant charm in his manner and conversation. Though born in London, and though he studied mainly in Antwerp and subsequently in Munich, his personality impressed one as neither English, Dutch, nor German, so much as French; he had the vivacity coupled with refinement which characterises the best type of Frenchman, and there was something rather French even in his physique and appearance; certainly he had nothing whatever of the "John Bull" about him. As a sculptor he perhaps just missed being great (great sculptors do not exist in profusion at present); but he was an artist of great versatility, refinement, and inventive power; if he did not impress one deeply, he was always sure of pleasing. His sense of decorative effect in sculpture was very highly developed; this was perhaps the most notable quality in his work; and he may be said to have invented for himself one type of sculptural production—that represented by the small bronze figures on decorative pedestals, under the titles "Dance," "Song," "Applause," &c., in which the figure and pedestal formed one design and could hardly be regarded apart from each other. Of Mr. Ford's more important works the two that have most of breadth and largeness of manner are two portrait figures, that of Gordon riding on a camel, and that of Queen Victoria exhibited at the last Royal Academy—a figure which rather surprised us by an element of grandeur which we had not before associated with his work, and which seemed to promise greater things had he been longer spared to us. A tolerably complete list of his principal works will be found in our Obituary column on another page.

Lord Leighton's House.

IT appears that the Borough of Kensington is about to take over Lord Leighton's house, which his two sisters have already handed over to trustees. Last week it was announced that this transfer had already taken place, but it seems that this information was somewhat premature, though there appears to be no doubt that the transfer will be soon made. It is certainly very desirable that there should be something in the nature of an art gallery in Kensington, which is a district very populous and very diverse in its inhabitants. There are many who would gladly visit an Art Gallery, such as Lord Leighton's house would become, if it was within a short distance of their home; and if once Lord Leighton's house is taken over by the Borough of Kensington, it may possibly form a nucleus for a larger gallery of a public and a local character; the more also that these new municipalities show public spirit in providing places of intellectual recreation, the greater will be their hold on the intelligent population of the district over which they rule. We confess that some of these days we hope that that historic building, Holland House, may become the property of the Borough of Kensington, for the time is coming when it will inevitably cease to be a private dwelling-house.

The Gwalior Gateway.

IT is a good many years since we illustrated and drew attention to the Gwalior Gateway, a very fine piece of decorative stonework carried out by Indian carvers in the hereditary style of their country, and which was erected at the Indian Exhibition at South Kensington. It was a present to the English Government from the late Maharajah of Gwalior. Since that time no one has seen anything more of it; it is said to be lying detached and in pieces in a back room of the museum. Major Keith, formerly the Art Conservator to Central India, who took a great deal of interest in the work, now writes to the *Times* to remind us that the donor's son, the Maharajah Scindia of Gwalior, will be a visitor to this country at the time of the Coronation, and suggests that the gateway should be put up in some conspicuous position, so that he may see his father's gift, and that there may not be the impression that we have slighted it. This appears to be a most proper and timely suggestion. In every possible way we should make the Coronation an opportunity to draw together England and India; and it would surely seem to an Indian prince a very ungracious thing that so costly and beautiful a gift should have been presented to us by one of his family, and that we have not taken the trouble to do anything with it or to place it in public view.

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The Church of St. Peter-at-the-Cross in West Cheap.

A FEW days ago an order was made by the Consistory Court of London for amending a faculty which the Court had granted in November, 1896, for adding a portion of St. Peter's Churchyard to the roadway which the then Commissioners of Sewers proposed to widen at the south end of Wood-street, Cheapside. A proviso was inserted, but it seems by some mistake, in the faculty that no building should be erected over two plots of land, immediately behind some shops in Cheapside, which had been the site of the parish engine-house, and of which the user was since granted (in 1898) to the trustees of the London Parochial Charities by the rector in consideration of 250*l.* paid on behalf of the living. The recent order annuls that proviso but the Court leaves to the civil tribunals to pronounce, should occasion arise, whether the Charities' trustees, who claim rights of user over the land behind the four shops of which they are the owners, can legally build upon the plots or devote them to other than ecclesiastical purposes. The shops are in part overshadowed by the large plane tree which, perhaps, suggested to Wordsworth the locality of his Reveries of Poor Susan, and stands in the churchyard of St. Peter's, which has not been rebuilt since the Great Fire. The church was built, says Hatton in his "New View," 1708, by Sir John Shaw, who died in 1503; Thomas Wood, of Wood-street, goldsmith, largely contributed towards the fabric; he also erected the highly ornamented fronts, with their ten gables, of the opposite houses, formerly Goldsmith's-row, in Cheapside. In the high road in front of the south-east corner of the church stood until 1643 the Queen Eleanor Cross—by some ascribed to Michael of Canterbury, by Hudson Turner to Henry of Huntingdon. It is said that the terms of the leases of the four houses adjoining the churchyard forbid the destruction of the plane tree or the building of an additional story that might injure it. All human remains have been lately removed from the vaults beneath the land in question, and the entrance to the vaults is closed.

Liverpool Cathedral.

FROM a letter signed "Liverpoliensis," which appeared a few days ago in the Liverpool *Daily Post*, it appears that with some at least of the Liverpool people the only object is to get as cheap a cathedral as possible, finished in as short a time as possible. This correspondent urges that the cost would be greatly increased by having a stone-vaulted cathedral, which is quite unnecessary; and that if they are content to have one with a timber roof "we could have an equally fine building for 250,000*l.*" (the question of monumental character in the architecture apparently counting for nothing), "and then we may hope this day five years hence to be worshipping in our new cathedral, and to see the whole building, spire and all" (a spire seems to be a *sine quâ non*), "completed during the episcopate of our present loved and honoured leader." At this rate, why not have a large corrugated iron church at once? That would be still cheaper and quicker, as these seem to be the main objects in the eyes of "Liverpoliensis."

EUSTON-ROAD FIRE BRIGADE STATION.—The names of the builders on this work, mentioned in our issue for the 21st ult., should have been given as "Messrs. Stimpson & Co.," not "Simpson & Co."

KNIGHTSBRIDGE, KENSINGTON, SOUTH KENSINGTON, AND EARL'S COURT:

1801-1900.

FOR a faithful, and indeed in other respects the best, presentment of Knightsbridge and Kensington in the earlier years of the nineteenth century, one should turn to a survey of the Kensington and Hyde Park Turnpike Trust, executed by Joseph Salway, surveyor to the Trust, and deposited in 1872 in the British Museum. Salway's drawings, 45 in. by 24½ in., and to a scale of 1 in. to 20 ft., are all dated at Sloane-street, June, 1811. He gives a general plan and detailed plans of both sides of the main roads under the trustees' control from the toll-gate at Hyde Park Corner to (1) the western boundary of Kensington parish at Counter's, or rather Caunter's (now Addison-road railway) Bridge; (2) Fulham Fields and Putney Bridge, through Brompton and Walham Green; and (3) Stone's End, Buckingham-gate, through Pimlico, to Battersea Bridge. He gives the elevations of every house, wall, pump, oil-lamp post, gate, &c.; every hedge, tree, and ditch, along the northern side of each road. The whole is properly coloured and set out with remarkable minuteness, altitudes are copiously indicated, and the construction of each road, pathway, and drain is fully described. The fifteen sheets, with plans, of vol. i. depict the high road, 2 m. 4 f. 80 y. long, through Knightsbridge and Kensington to the boundary of Fulham parish, where it emerges into open country, and, crossing the brook at 9 ft. above high-water level, reaches the end of the route at the Hand and Flower by the corner of Portland-place, opposite Lee & Kennedy's nursery in the ancient Vineyard—the site of Olympia—at Caunter's Bridge.

KNIGHTSBRIDGE.—Going westwards from the turnpike at Hyde Park Corner, we pass on our left hand St. George's-place, of which No. 12 was built in 1837 for Thomas Goding, of the brewery at Albert Gate, the architect being Francis Edwards (1784-1857), and the Alexandra Hotel, behind which is Old Barrack-yard, the site of the Grenadier Guards' barracks and stables as plotted in Lockie's map, second edition, 1816, and vacated in 1836. Opposite the Conduit Head (still within the Hyde Park railings) was built (1842) the St. George's Gallery for Nathan Dunn's Chinese Exhibition, and afterwards occupied by Gordon Cumming's African Exhibition, Bartlett's and Beverley's Diorama of the Holy Land, and the Turkish Exhibition. St. Paul's Church (T. Cundy, 1840-3) was lengthened and the chancel was remodelled (1870-1) by R. J. Withers; Sir Arthur Blomfield (*obiit* 1899) added the St. Luke's Chapel; Messrs. Bodley & Garner enlarged the chancel and designed the east window; the five lights of the latter were filled with Radix Jesse glass by Messrs. Lavers & Westlake. In Park-side, on the right hand, is Holy Trinity Church (1860-1) [R. Brandon and H. M. Eyton, April 21, 1860*], on the site of a district chapel rebuilt in 1699 and again in 1789, that had been the hospital chapel of a lazar-house (1595), appertaining to the collegiate church of St. Peter, Westminster, which Laud converted into a chapel-of-ease for the parish of St. Martin-in-the-Fields, within the limits of which it then stood. The Ecclesiastical Commissioners ratified a scheme last April for uniting the benefice with that of All Saints, in Ennismore-gardens, and applying the proceeds of a sale of the site and materials of Holy Trinity Church towards a new church and parsonage-house (Mr. Bodley, A.R.A.) in Prince Consort-road—see the "Gore Estate." The church stood between two public-houses. The tavern and three houses on the west side have lately given way to the new ball and reception rooms of the house which the French Embassy bought four years ago for 25,000*l.*, the Crown, we understand, retaining the ground-rent. That house is one of the two once known as "Malta" and "Gibraltar" because they could not be taken, built by T. Cubitt, who sold the eastern house to George Hudson, the "Railway King," for 15,000*l.* After Hudson's death in 1871, the house passed to the Great Northern Railway Co., who let it furnished to the French Embassy. The house on the west side of the gates, having been untenanted during many years, was sub-divided into three, but has lately been returned to its original state. The next house was built in 1853 for Captain Thomas Leyland, on the site of Dunn's Chinese Exhibition (1851). The gates and three houses occupy the sites of the Fox and Bull, originally the Fox, tavern cited by Addison, and the Cannon Brewery, built before 1836 (Francis Edwards) for Thomas Goding, the brewer, mentioned above. The Fox and Bull, for which Sir Joshua Reynolds, reputedly, painted the sign that was blown down in 1807, since served as the Royal Humane Society's receiving-house. The bridge that carried the road across the West Bourne, also known as the Bayswater rivulet, flowing from the Serpentine, was removed in 1841. On the gate-piers (1845) are the two stags, modelled after a pair of prints by Bartolozzi, taken thither from the Ranger's Lodge in Green Park (Robert Adam, 1768), pulled down in 1820. The site of the gate and of the two later lofty houses was bought by the Government for 21,000*l.* from the Dean and Chapter of Westminster and the proprietors of the Cannon Brewery. The road into Hyde Park was opened on April 6, 1842. Next, west, is the block erected originally for Hyde Park Court, Ltd., by J. W. Hobbs & Co. (1887-9) from plans and designs of the late firm of Archer & Green, and completed, after the dissolution of that firm in 1889, by Mr. Thomas Archer and Mr. Francis Hooper. The site covers about 28,400 ft. superficial; the west wing was built for the Hyde Park Club. The island at the junction of Brompton and Knightsbridge High roads is all that encroachments have left of the old village green. A railed-in portion on the north side was, it is said, the lazar-house burial-ground; the watch-house and pound stood at the east end until 1834; a block of cottages formed "Middle-row"; on the north side (west) was the old Marquis of Granby. In 1865 Edmund Tattersall (*obiit* 1898) and his two sons migrated from "the Corner" at Grosvenor-place to their new premises, covering two acres, at the west side of the Green, built by Messrs. Holland & Hannen after Mr. Charles Freeman's plans and designs. The Duke of Wellington's Riding-school with the stables, coach-house, &c. (1857, P. Hardwick), No. 42, Albert Gate, covering an area of 16,900 square ft., were sold at auction for 60,000*l.* in March, 1891, and on the site has been erected Wellington Court (Mr. M. E. Collins). Concurrently with the rebuilding of the Household Cavalry barracks [Thos. H. Wyatt, February 2, 1878] the late Metropolitan Board of Works paid 5,000*l.* for 7,623 square feet for a widening of the main road from 50 ft. to from 68 ft. to 70 ft. for about 1,100 ft. on its north side along the new barracks. The work was opened in September, 1880. Opposite, at Rutland Gate, is the site of Stratheden House and grounds, extending over about 4,400 square yards, which was withdrawn from sale by auction at 89,000*l.* in June, 1900. It had been the home of Lord Campbell, who died there in June, 1861. The site is taken for a block of flats (Mr. Delissa Joseph).

KENSINGTON.—Just beyond the cavalry barracks, and abutting against the wall that until 1825 enclosed Hyde Park, at a point due south of the powder-magazine in the park, stood the Half Way House, pulled down in 1848. Alford House was designed by Sir M. Digby Wyatt (1820-1877); two houses in Lowther Gardens, Exhibition-road, are by Mr. J. J. Stevenson [February 9, 1895, a porch]. Gore House, the home of William Wilberforce (*obiit* 1833), and afterwards, until 1849, of Marguerite, Countess of Blessington and Count Alfred D'Orsay, was tenanted in 1851 by Alexis Soyer as the Symposium restaurant and concert gardens. After the Gore estate (see *post*) had been chosen as the site of a new National Gallery, with schools of art and science, a beginning was made with an exhibition in Gore House of cabinet-work and studies from the art schools, but in the end the site of the house and grounds was cleared in 1857, and Albert Hall-mansions (Mr. R. Norman Shaw, R.A.) and the Royal Albert Hall occupy their place. Mr. Shaw was the architect also of Lowther Lodge and of Nos. 170 and 185, Queen's-gate, formerly Prince Albert's-road [June 26 and December 4, 1897: "Sketches of London Street Architecture," xv. and xxi.]. They are two notable houses, architectural expression in the latter being obtained almost entirely by the treatment and grouping of the windows. No. 170, designed in pure William III.-Queen Anne style, was built by Mr. Downs, of Walworth, in 1888-9, for Mr. F. A. White, who courteously informed the writer of this article that he obtained the

* Dates in *square* brackets relate to illustrations in the *Builder*.

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site, 43 ft. by 53 ft., from the Commissioners of the 1851 Exhibition; the marble floor of the entrance-hall came from Squerrye's Court, Westerham, associated with General Wolfe's memory; the boudoir and drawing-room mantelpieces from an eighteenth-century house—No. 25 (formerly 17), Millbank-street, Westminster; that Mr. Shaw designed the drawing-room ceiling after those at Ashburnham House, Dean's-yard, and the (new) wood-carving (executed by Mr. Wickes, of Wells); Mr. Crittall, of North-street, Manchester-square, executed the ironwork, and that nearly all the old woodwork and marble plaques and inlays are relics from Halstead-place, Kent, and houses in the City of London. At the corner, east, of Palace Gate is the stone-built gabled Thorney House, standing in grounds having an area of nearly 40,000 sq. ft., and built about thirty years ago by Messrs. Cubitt & Co. for the Duke of Bedford. Certain covenants entered into by the Duke in respect of that and an adjoining property which he purchased were the subject of a suit, Rogers *v.* Hosegood, reported in our columns of November 18, 1899. In 1873, Sir John Millais, P.R.A., bought from Messrs. Cubitt & Co. some adjacent land in Palace Gate, on which he built a house, No. 2, after the plans and designs of P. C. Hardwick, *obiit* January 27, 1892 [June 10, 1876]. Palace Gate House has been refronted and remodelled by Mr. C. J. H. Cooper [September 17, 1898]; Kensington Gate was erected in 1849 on the site of the pest-house built in 1665 by the Earl of Warwick, since used for the parochial poor, and demolished in 1848. Opposite the Gate, at No. 7, Canning-place, lived, in 1856, Alfred Stevens, who there made his first designs and clay model for the Wellington monument in St. Paul's Cathedral. Salway delineates the barracks which, with the alcove or summer-house, stood within Kensington Gardens at the end of the Broad-walk; the latter, attributed to Wren, has been removed from the Dial-walk to the hollow at Marlborough (formerly Bush Hill) Gate; at Hogmire-lane (Palace Gate) is the toll-bar; the houses between Palace Gate and De Vere Gardens, where stood Noel House and Malcolm's nursery, mark the site of Batty's open-air hippodrome [Taylor, May 10, 1851].

Kensington Palace and the Gardens.—In May, 1899, by the desire of Queen Victoria, the State apartments in the south and east portions, overlooking the private gardens, were opened to the public. Princess Louise's marble statue of the Queen (1893) is opposite the room in which Queen Victoria was born. At the same time the Queen Anne's Banqueting-house or Concert-room (latterly the Orangery), attributed to Wren, and which had been shamefully misused as the gardeners' store and tool house, was cleaned and repaired [Mr. G. Weald's measured drawings, January 12, 1895]. The bridge crossing the Serpentine (1825 6) is by John and George Rennie, and cost about 36,000*l.*; the fountains, with figures, and the engine-house at the northern end of the Serpentine were designed by John Thomas (*obiit* 1862); the statue of Edward Jenner (*obiit* 1823), by W. C. Marshall (*obiit* June 17, 1894), had been first set up in Trafalgar-square in 1858. During some years past the gardens have been subjected to many alterations that spoil their natural beauty, amongst them being the wanton destruction of the fine old yew hedge along the west side of the path running northwards from the two brick piers by the Orangery, which was cut down and replaced with an iron railing at the making in December, 1887, of the entrance in the north-western corner, and the addition to the gardens, by Queen Victoria's desire, of the strip of ground along the Bayswater-road. The London Government Act, 1899, constituted the parish of Kensington into a borough—it is now a Royal borough—and the Palace with the portion, to the south, of the Gardens have been transferred from the parish of St. Margaret, Westminster. The population, in 1901, was 176,623.

The Queen appointed Sir G. G. Scott to be architect of the Prince Albert Memorial [May 23, 1863, with plan; and November 22, 1873, details], built by John Kelk, who contracted for a sum not to exceed 85,508*l.*, and completed in April, 1871, at a total expenditure of 132,000*l.* Mr. G. G. Scott assisted his father in making the original drawings submitted to the Committee, and Mr. J. Oldrid Scott and Mr. Coad helped in preparing the working drawings. The central portion rests upon a concrete bed 160 ft. square, and with a minimum depth of

(Campden House, Kensington.)

(From an engraving in *The Mirror*, 1837.)

17 ft. The seated figure of the Prince is by Foley; the marble groups of Europe, Asia, Africa, and America are by Macdowell, Foley, W. Theed, and John Bell respectively; those of Commerce, Manufactures, Agriculture, and Engineering by Thornycroft, H. Weekes, W. C. Marshall, and John Lawlor respectively; the bronze figures of Astronomy, Geology, Chemistry, and Geometry on the outer faces of the great pillars, and those of Rhetoric, Philosophy, Medicine, and Physiology in the niches over the capitals are by J. Birnie Philip and Mr. H. H. Armstead, who also sculptured the marble figures in relief around the podium—the architects (including Wren, Pugin, Barry, and C. P. Cockerell) and sculptors being by the former, the painters, poets, and musicians by the latter. The gilded bronze statues in the spire, which with the cross rises to 170 ft., are by James Redfern; the tabernacle work and gable crests, with all the artistic metalwork, are by F. A. Skidmore; the architectural carving is by Mr. Brindley, and Messrs. Clayton and Bell made the cartoons for the mosaics in the tympana and spandrels, and the vaulting of the canopy, executed by Signor Salviati.

In Kensington Palace-gardens, laid out over the Queen's-road by Sir James Pennethorne for the Commissioners of Woods and Forests in pursuance of the Act 5 Vict. c. 1., are Nos. 13, Harrington House, 1852, for the Earl of Harrington, by C. J. Richardson; 18-9, by Sir Charles Barry; and 11, with the adjoining house, 1852-4, by S. Smirke the elder. On the Green (or Moor), nearly opposite No. 2, the house that Thackeray built for himself in 1861-2, remained until 1871 the conduit house, having a vaulted roof, which Henry VIII. built, *circa* 1536, for supplying Chelsea with water; there are two views (1857) in the Archer Collection. Returning into the High-street, we see that the two piers at the entrance of the private road to the Palace have been renewed and fitted with gates (1900), and that the site of the King's Arms, burnt down on June 10, 1857, and well remembered by readers of "Esmond," with its yard, has been taken for the Royal Palace Hotel, 1893-4 (Mr. Basil Champneys, Messrs. Perry & Co., contractors), to which the ballroom suite and banqueting-hall were added (1896-7) by Messrs. Bywaters & Son, who contracted for 21,343*l.*, after Messrs. Henry S. Legg & Son's plans and designs [November 13, 1897]. For the site, about 7½ acres, of Kensington House on the south side of the street, which side has since been widened by the (old) Vestry and the late Metropolitan Board of Works, were demolished in 1872-3, the Warren or Rookery, Colby House (site of the London and County Bank, opposite Kensington Palace-gardens), erected in 1720 for Sir John Colby, and old Kensington House—the home of Louise de Querouaille, Duchess of Portsmouth, of James Elphinston the schoolmaster and translator of Martial and friend of Dr. Johnson, of the Jesuit Pères de la Foi and M. le Prince de Broglie's school, of the Cosways, and in 1819-21 of Mrs. Inchbald. Kensington House was begun in 1873, after Mr. James Knowles's designs and plans, for Baron Albert Grant (*obiit* 1899), who, however, did not occupy it, nor indeed was the house completed, after nearly 275,000*l.* had been expended. It was ultimately sold at auction in lots for a total sum of 9,915*l.* in June and September, 1882. The white marble staircase that reached up to the second floor and had cost 11,000*l.* was secured for 1,000*l.* by Madame Tussaud & Sons, and part of it, with the caryatides of heroic size is now in their exhibition, Marylebone-road; the gilded cast-iron railing, fronting the main road, that cost 3,500*l.* was bought for 300 guineas by the Sandown Park Race Committee. The ground was speedily covered with the houses and flats, seventy-five in all, of Kensington-court designed for Mr. J. T. Carr by Messrs. Perry & Reed (flats), Mr. J. J. Stevenson, Mr. T. Graham Jackson, R.A., [No. 2, June 27, 1885], Mr. W. W. Gwyther (No. 61), Mr. R. J. Worley (Kensington House), and other architects; whilst on the site of Colby House stands the London and County branch bank (from No. 67) built in 1885 by Messrs. T. Rider & Son, after Mr. Alfred Williams's designs [September 11, 1886]. An Act of 1896 provided for an improvement of the James-street area, with the widening of Charles-street and the western end of St. Alban's-road, and the making of two new roads out of Kensington-square into St. Alban's-road and Kensington-court. On the south side of the square is the Convent Chapel of the Assumption, by Goldie & Child [May 31, 1873]. The old Grammar School houses, Nos. 25-9, on the west side, opened January 24, 1831, have lately been taken (1900) by a firm of linen-drapers.

In 1683 the south aisle, and in 1695 the north aisle and chancel, of the parish church of St. Mary Abbot were rebuilt; in 1772 the stone tower was pulled down. Having been repaired in 1811 at a cost of 5,000*l.*, it is replaced by the church begun in 1869 by Messrs. Dove Bros., after Sir G. G. Scott's plans and designs [January 1, 1870], for 1,606 seats; the organ front, 1893, is by his son, Mr. J. Oldrid Scott, the carving by Messrs. Farmer & Brindley, and the glass in the clearstory windows by Messrs. Clayton & Bell. A widening of the south side of the High-street, for a length of 460 ft. between Young-street and the Metropolitan Railway station, and the new thoroughfare (Hall-street) from Young-street to King-street were completed in October, 1869, for the late Metropolitan Board of Works by Messrs. Nowell & Robson, at a net cost of 126,434*l.*, the width being increased to a minimum of 45 ft. and a maximum of about 65 ft. from a minimum of 20 ft. and a maximum of about 45 ft. The site of the Kensington Charity Schools, 1713, by Sir John Vanbrugh, enlarged in 1817-8, and latterly a savings-bank, was bought for 7,100*l.*, with some adjoining property in Church-court, for the Town Hall (opened by the late Duchess of Teck on November 7, 1880), built by Messrs. Brand & Co., who contracted for 30,549*l.*, from the designs of Robert Walker, *obiit* 1896; in 1891 were added administrative departments, a coroner's court, &c., by Messrs. Leslie & Co. (contract, 13,747*l.*), after plans prepared by Mr. W. Weaver, Surveyor to the Vestry, and Mr. W. G. Hunt, joint architects. The schools have been rebuilt at the west end of the parish church, where may be seen the quaint original figures of a boy and girl. The Vestry Hall [June 12, 1852], in the Jacobean style, by Broadbridge, replaced the vestry-room which adjoined the (old) parish church.

By the east corner of Wright's-lane a large drapery shop has replaced the house inhabited by Cobbett, at the back of which, on the east side of the lane, stood Scarsdale

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House. At the end of the lane was Carmarthen House; further southwards, in Marloes-road, was built the new workhouse and infirmary. On the west side of Wright's-lane are blocks of flats begun three years ago for the Mansions Estate Company by Messrs. Metcalf & Greig, who designed also similar blocks in Iverna-gardens; Cheniston-gardens stand on the site of Abingdon House. Eleven of the sixteen houses of The Terrace on the south side of the high road, next west from Wright's-lane, were sold in May, 1892, for the erection of residential flats. Of those houses, which had large gardens, No. 7, a home of the third Earl of Shaftesbury, author of "Characteristicks," but since rebuilt, had been occupied in 1824-5 by Sir David Wilkie; at No. 1 lived Sir Henry Cole, and at No. 6 John Leech. On May 14, 1868, was laid the foundation-stone of the Pro-Cathedral of St. Mary [June 11, 1868], built by Simpson after the designs of Goldie & Child: George Goldie *obiit* March 1, 1887. The style is that of the early thirteenth century, with geometrical tracery in the apse and principal façade, the nave having a continuous barrel vault of timber, with a moulded king-post and tie-beam to each principal. The church was dedicated to "Our Lady of Victories" on May 1 last, the debt of nearly 9,000*l.* having been discharged during the past six years.

By the death, at Naples in 1859 of Henry, fourth Baron Holland, *s.p.*, that title became extinct. His widow, Mary Augusta, disposed of the house and estate—about 80 acres—to her kinsman, Henry, fifth Earl of Ilchester, who entered into residence there shortly after Lady Holland's death on September 23, 1889. Some alterations of the interior, with external repairs, were effected for Lord Ilchester by Colonel Edis in 1890-1.* Meanwhile, a portion of the park on the north side had been sold for building purposes (Holland-park), and on the south-west have been built Melbury-road (Nightingale-lane) and Holland Park-road. In Melbury-road are two semi-detached houses by Mr. Halsey Ricardo [July 7, 1894]; W. Burges designed his own house, the sculpture being by Mr. Nichols (1878), as did also Edmund Street; No. 14 is by Mr. J. J. Stevenson. Mr. Basil Champneys designed his own residence, and one for Mr. Holiday. No. 8 is by Mr. R. Norman Shaw, and Little Holland House, No. 6, was rebuilt in 1885 for Mr. G. F. Watts, R.A. In Holland Park-road, at No. 1, Mr. P. Webb designed the studio and marble corridor [October 2, 1897] for Mr. V. C. Prinsep, R.A.; No. 2, Leighton House, was built thirty years ago for Lord Leighton, P.R.A. (*obiit* January, 1896), and devised by him to his sisters, Mrs. Sutherland Orr and Mrs. Mathews, who generously devoted it, together with its contents (to which several of his friends have contributed), to the public.† Professor Aitchison designed the picture gallery [November 9, 1895] and the studio, the frieze of birds in mosaic upon a gold ground in the Arab Hall is by Mr. Walter Crane. Leonard-place, Earl's-terrace, and Edwardes-square were built by M. Changier, a Frenchman who, so runs the story, intended that the square, with its small houses and large garden, should be occupied by officers of Napoleon's army when the then threatened invasion of England had succeeded.

SOUTH KENSINGTON.

The Gore and other Estates.—In their second Report, dated November 11, 1852, the Commissioners for the Exhibition of 1851 estimated their surplus funds at about 170,000*l.* Their third Report, dated April 12, 1856, sets forth that their receipts then amounted to a total of 349,338*l.* 5s. 5d., arising from 186,436*l.* 18s. 6d. —surplus, 157,500*l.*—voted by Parliament in the Sessions of 1852-3 and 1854-5, and 5,401*l.* 6s. 11d.—rents and miscellaneous receipts; their expenditure had amounted to 247,595*l.* 8s. 7d. for the purchase of lands, tenants' compensation, road-making, and other items. The two Parliamentary votes amounted to 177,500*l.*, but 20,000*l.* of that total had not then been paid. In 1852 they bought for 60,000*l.* the Gore estate, 21½ acres, having a frontage of 600 ft. to the Kensington-road and extending southwards obliquely, about 1,250 ft., to a point on the east side of the present Exhibition-road. They also purchased from the Baron de Villars's executors for 153,500*l.* an irregular area of 48 acres adjoining the west and south sides of the Gore estate and crossing the later Cromwell-road. To those purchases they added the Smith's Charity estate, at the south-western corner of the Gore estate, and 17 acres of Lord Harrington's estate. Of the last-named property the greater part of the portion so bought included Brompton Park, lying on the east side of Exhibition-road and on the north side of Brompton-road—the site eventually of the South Kensington Museum. Nearly the whole of the combined properties consisted of open ground, nursery gardens, and so on, traversed in a south-easterly direction by two lanes. The one lane ran from Hogmire-lane (at the present junction of Gloucester-road and Victoria-grove), past one of Malcolm's nurseries to Hale, otherwise Cromwell, House (see "Notabilia"), Stanhope nursery, and Methwold's Almshouses which stood where Harrington-road meets Harrington-gardens; the other, Gore-lane, ran from Kensington-gore at a point in Kensington-gore about 50 yds. east from the present Queen's-gate to Grove Lodge in Old Brompton-road—where is now Thurloe-place—opposite Harrison & Bristow's nursery (Thurloe-square and Alfred-place). Between the two lanes stood the Kensington Workhouse (Kensington-gate, south side): see a scarce map of London, 1836, beautifully drawn by W. B. Clarke, architect. Most of the houses on the purchased lands lay along the northern bend of Gore-lane. The Commissioners acquired the fee-simple of them, including the Hoop and Toy tea-gardens, from Lord Kensington, and obtained an Act, July 3, 1854, for laying out the site. On the south of a nursery extending northwards to Kensington high road (see Rocque's map), and famed for its fruit trees, was Brompton Park, that had been brought in marriage, 1779, to Charles, third Earl of Harrington, by Jane, daughter and co-heir of Sir John Fleming, Bart. The manor-house became an official residence attached to the Museum. Sir William Cubitt laid out Exhibition-road, Prince Albert's-road (renamed Queen's-gate), part of Cromwell-road, and Gore-road (renamed Queen's Gate-terrace), 1⅛ mile long in the aggregate, and completed in March, 1856, by William Jackson, contractor, at a cost of 17,980*l.*

Science and Art Department and Victoria and Albert Museum.—The Commissioners at first intended to appropriate the Harrington estate as the site of a Museum of Manufactures, and the Gore House estate for a new National Gallery. A separate Commission had recommended (in August, 1851) the latter site for that purpose by reason of the dryness of the yellow gravel soil and because "those large open spaces afford a security against the inconveniences to which the National Gallery is exposed, and are the only grounds which remain safe for future years amidst the growth of the metropolis." But the two schemes were modified in conjunction with a re-constitution of the Science and Art Department, which had its origin in the School of Design, established in 1836-7 at Somerset House under the Board of Trade. In 1841 the Government resolved to contribute towards the formation and maintenance of Schools of Design in our chief centres of manufacturing industries. An inquiry conducted eight years afterwards showed that the schools were not working satisfactorily. The Treasury gave 5,000*l.* towards the establishment of a Museum of Art, which was opened at Marlborough House, Pall Mall, in 1852, the exhibits consisting mainly of purchases from the Great Exhibition and the casts removed from Somerset House. At that time there were forty-two self-supporting schools in the provinces, and twenty subsidised by the State, with Sir Henry Cole, K.C.B. (*obiit* 1882), as Superintendent of the Department of Practical Art, and R. Redgrave, R.A., as Art Adviser. A Treasury minute of 1853 formally constituted a Department of Science and Art, which an Order in Council of February 25, 1856, transferred to the then Committee of Privy Council on Education. In the following year, Cole having meanwhile been appointed Inspector-General with Dr. (since Lord) Playfair as Secretary of the united Departments, the Department migrated to the new buildings at South Kensington built by C. D. Young & Co., of Edinburgh and London, under Sir William Cubitt's superintendence, and opened by Queen Victoria on June 22, 1857. The contractors' general specification (dated June 13, 1855) was for a structure mainly of corrugated iron having three segmented roofs, 42 ft. span, with malleable iron trusses 7 ft. asunder, and skylight 12 ft. wide along the entire ridge of each roof, 266 ft. by 126 ft. and 30 ft. high to the eaves, affording (with the galleries) an exhibition area of 6,400 yards superficial, to cost about 9,800*l.*, without an architectural front of cast-iron (from 1,000*l.* to 1,400*l.* more). The buildings (site of the new South Court) were pulled down ten years afterwards and re-erected for the Bethnal-green Museum. Sir Henry Cole resigned in 1873. The mechanical models, engines, and other interesting exhibits of old patented inventions, originally gathered by Professor Bennet Woodcroft, F.R.S. (*obiit* February 7, 1879) when Clerk to the Commissioners of Patents, were, together with a similar collection stored in Kensington Palace, deposited in an iron annexe of the Museum; the Patents, Designs, and Trade Marks Act, 1883, transferred them to the Science and Art Department; on September 2, 1897, the "Brompton boilers" were sold at auction. See, in the Commissioners' Report, 1856, a coloured plan of the estates as bought and laid out; and coloured drawings to scale of the building of 1855-7. Captain Francis Fowke, R.E. (1823-65), architect and engineer to the Science and Art Department, made the plans and designs for the extension buildings of the Museum, which comprised the Architectural and other courts, the Sculpture and Oriental galleries, and the Turner (water-colours), Vernon, and Sheepshanks picture galleries—for the latter R. Redgrave devised a successful mode of top-lighting, and the cost of the picture galleries, with fireproof floors, amounted to, it is said, scarcely 4d. per cubic foot. In August, 1891, Mr. Aston Webb's designs [August 15, 1891, perspective view of exterior, and interior of central hall] were selected in competition, Mr. A. Waterhouse having acted as professional adviser, for the completion, at an estimated cost of about 420,000*l.*, of what will henceforth be called the Victoria and Albert Museum, whereof Queen Victoria laid the foundation-stone on May 17, 1899. In the interval some changes had been made in the accepted design and plan which, as modified, we described on May 20, 1899, and illustrated on May 27, 1899 (the Cromwell-road front and ground-floor plan); the new works have been begun by Messrs. Leslie Bros., contractors. We illustrated the competitive designs of the late William Young, Mr. W. Emerson, and Sir T. N. Deane & Sons on August 22, August 29, and September 12 and 19, 1891, respectively. Our number of May 20, 1899, contains a block-plan of the Museum, School of Art, Natural History Museum, present College of Science, Royal College of Science, Science Museum Galleries, Imperial Institute, Royal College of Music, and City and Guilds of London Technical Institute, which now occupy the space acquired in 1852-3 by the Exhibition Commissioners.

The Natural History Museum.—The insistent efforts of the late Professor Owen, who in 1856 had been appointed the first Superintendent of the Natural History Department, British Museum, at length moved the Government in 1861 to instruct Mr. Hunt, the Surveyor to the Office of Works, to issue to competing architects copies of a plan based upon Professor Owen's requirements—he said he "wanted, in the first place, room for seventy whales"—for a separate museum on the Cromwell-road site. The Committee of Selection consisted of Lord Elcho (since Lord Wemyss), Tite, David Roberts, Fergusson, and Pennethorne. In May, 1864, they awarded the first premium, 400*l.*, to Captain Fowke [May 28, 1864, perspective view and plan]; the second, 250*l.*, to Professor Kerr [June 25, 1864]; and the third, 100*l.*, to Cuthbert Brodrick. Captain Fowke died in September, 1865, before he had completed the details of his design, which was for a red brick building, with two detached wings, after the French Renaissance style, copiously ornamented with white and red terra cotta. His drawings were committed for their completion to Mr. Alfred Waterhouse, who, however, after two years' labour, found it impossible to adapt them for the practical purposes required. In February, 1868, Mr. Waterhouse was given a free hand, and in April the trustees of the British Museum adopted his initial plans for a building after the refined Romanesque style of the eleventh century. His designs were

* The central block and turrets, 1607, are ascribed to John Thorpe: Lord Holland (beheaded March 9, 1649) added the wings and arcades. The piers of the east gate, carved by N. Stone, are by Inigo Jones, 1629.

† On November 26 last the Royal Borough Council resolved to accept a gift of the house and grounds from the Leighton House Executive Committee, and to maintain them as a memorial and a museum of art.

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perfected in 1871, the Act for building on a site of seven acres—being that of Captain Fowke's International Exhibition, 1862, buildings—was passed in 1872, the works were begun in 1873, and on Easter Monday, 1881, the Museum was opened to the public. We believe that Mr. Waterhouse's plans comprise two east and west wings, not yet erected. In 1897 the west wing site was taken for a temporary building for the cetacea collection.

Royal Albert Hall.—General Scott based his plans and designs upon those originally made by his deceased brother-officer Captain Fowke, J. W. Grover, C.E., being the constructive engineer and Messrs. Lucas Bros. the contractors. The height of the Hall to the apex of the roof is 165 ft.; the major and minor axes are 219 ft. and 157 ft. To meet the cost—about 200,000*l.*—the seats were sold for a term of 999 years at prices ranging from 1,000*l.* for a grand-tier box to 100*l.* for a stall. The organ is by Henry Willis, and the sixteen cartoons for the terra-cotta mosaic frieze by Sir E. J. Poynter, P.R.A., Mr. H. H. Armstead, R.A., Pickersgill, R.A., S. Marks, R.A., Horsley, R.A., Armitage, R.A., and Yeames, R.A. Queen Victoria laid the foundation-stone on May 20, 1867, and opened the Hall on March 29, 1871 [December 10 and (plan) 31, 1870].

The Horticultural Society's Gardens and the Exhibitions of 1862, 1871-4, and 1883-6.—In 1859 the Royal Horticultural Society (founded in 1804 at Kensington) rented from the Commissioners some twenty acres of the Gore and other estates lying between Exhibition-road and Queen's-gate. Sir Henry Cole, R. Redgrave, and Captain Fowke laid out the gardens, with their terraces to overcome the decline southwards, and fountains. Sydney Smirke (*obit* 1877) designed the two side arcades in curves to meet the conservatory at the north [July 9, 1859, and December 29, 1860], 240 ft. by 64 ft. and 75 ft. high. In the gardens stood Durham's memorial to Prince Albert. The Society's gardens were completed in readiness for the International Exhibition, 1862, held in the building designed by Captain Fowke (Natural History Museum site). That building consisted of a nave 85 ft. by 1,150 ft. and 100 ft. high, with two end transepts 85 ft. by 692 ft. and 100 ft. high, and an octagon, 160 ft. diameter, at each crossing. Over the two octagons were two vast glazed domes rising to 200 ft. inside, and, with their finials, to 250 ft. outside. The nave roof had a semi-circular rib 18 in. deep by 10 in. wide, made in only six pieces, and was after the older or De L'Orme's construction; there was also a rafter, the outline of the rib being not followed by the covering; the span, 85 ft., was 13 ft. more than that of the Crystal Palace. The nave roof and the domes were re-erected at the Alexandra Palace, Muswell Hill, since destroyed by fire. A series of annual exhibitions was held on that site in 1871-4. General Scott, R.E., designed the buildings for 1871 [December 10 and (plan) 31, 1870], Mr. J. W. Grover, C.E., being consulting engineer for the constructive part, and Messrs. Lucas Bros. the contractors.

As the Society's new gardens failed to receive the public support which had been anticipated, the Commissioners felt themselves constrained to exercise their rights of re-entry, and succeeded, on an appeal, after an action at law which arose from the resistance of the debenture-holders. The gardens were then dismantled in preparation for the International Fisheries Exhibition, 1883, held in buildings—afterwards enlarged—that had been erected under, we believe, General Scott's superintendence. Then followed the International Health and Food (1884) and International Inventions and Music (1885) Exhibitions; the Indian and Colonial Exhibition, the last and most important one, was opened by Queen Victoria, in the Royal Albert Hall, on May 4, 1886, and realised a surplus of more than 35,000*l.* In 1875 the India Museum had been removed into the gallery along the east side; a suite of rooms of the Exhibition of 1874 was allotted to the National Portrait Gallery collection which had been established in Great George-street, Westminster, in 1859. Whilst the exhibitions did not prove financially successful in the end, the garden fêtes and concerts provided an unwonted open-air entertainment. In 1884 a novel attraction consisted of a set of models to scale illustrative of London in the olden days, erected at a cost of 13,800*l.*, from the drawings and under the supervision of Mr. George H. Birch, late honorary secretary to the London and Middlesex Archæological Society. Mr. Birch arranged twenty-four buildings, on the lines of a street entered through Bishop's Gate in the City wall, with a typical church tower at the turning of the street into "Elbow-lane." He made many of the drawings from originals in the Gwilt, Gardner, and other private collections not generally known to the public, and was thereby enabled to give an uncommon and highly-interesting presentment of domestic architecture in by-gone London. The sale in January, 1887, of the materials, comprising upwards of 823 lots, of all the buildings, together with the old London street, of the four exhibitions was followed on April 9, 1889, by the sale of the arcades, conservatory, and all out-door effects in the gardens; the ground was then gradually plotted out for new roads and the erection of various public institutions, in accordance with the terms of the Commissioners' charter, which empowered them "to increase the means of industrial education, and extend the influence of science and art upon productive industry."

The Imperial Institute.—On July 4, 1887, Queen Victoria laid the first stone of the buildings planned and designed by Mr. T. E. Collcutt, and opened in May, 1893. On July 2, 1888, was executed the lease for the conveyance of the site from the Commissioners. The foundations having been completed in May, 1888, at a cost of 6,000*l.*, tenders from Messrs. John Mowlem & Co. were accepted, in July, 1888, for the making of Imperial Institute-road (5,825*l.*) and for the main buildings—the towers excepted—(142,800*l.*, from a list of fifteen competing contractors). The same firm's accepted tender for the central and eastern and western towers amounted to 18,797*l.* [July 2, 1887, large view of Mr. Collcutt's competitive design; July 9, 1887, plans of the ground and principal floors, with details of façade; January 5, 1889, large perspective view; and June 18, 1892, central tower]. In the autumn of 1892 an Australian lady presented the "Alexandra" peal of ten bells, weighing more than eight tons, cast by Messrs. John Taylor & Co., of Loughborough, and hung by them in the central or "Queen's" tower at a height of 200 ft. above the ground-floor level. In the course of the year 1899 negotiations took place between the Treasury, the Institute, and the University of London. On July 28 of that year was issued a supplementary estimate for 65,000*l.* for the purchase and maintenance of the Institute, accompanied by a Treasury minute affecting the disposal and future use of the buildings. It was arranged—(1) that the lease should be taken over by the Commissioners of Works as representing the Crown; (2) to assign a portion of the buildings, free from rent, for the use of the Institute; (3) to accommodate the University in the eastern and central portions of the main block, including the principal entrance, vestibule, staircase, and the Great Hall; (4) to make structural alterations in view of (2) and (3) respectively; and (5) that in consideration of (1) the Government should pay off an existing mortgage of 40,000*l.* on the building, and also discharge a floating debt of the Institute, not to exceed in all 15,000*l.* The University of London held their first meeting in the Institute on May 8, 1900. On December 21 last the Executive Council resolved to transfer the Institute with all its property to the nation.

Other Public Buildings.—For the City and Guilds of London Technical Institute in Exhibition-road, opened on June 25, 1884 [Mr. Alfred Waterhouse, A.R.A.; January 5, 1884, elevation and ground floor plan], the Commissioners granted in 1881 a 999 years' lease at a peppercorn rent, the money for its erection and maintenance, to the amount of 100,000*l.*, being contributed by the City of London. The public subscribed for the Royal College of Music (a successor of the National Training School for Music) of which Sir George Grove, *obiit* May 28, 1900, was the first director. The National Training School [July 18, 1874] was begun in December, 1873, after plans and designs by Lieutenant H. H. Cole, R.E., and opened on May 17, 1876; the Royal College, incorporated in 1883, was built of red brick and Weldon stone, in free Renaissance style, by Thompson, of Peterborough, from Sir Arthur Blomfield's designs and plans [July 16, 1892], and was opened by the King on May 2, 1894. Sir Francis Cook presented the Alexandra House, Mr. Samson Fox, of Leeds, engineer, subscribed 60,000*l.*, and Sir Hubert Parry presented the organ. A considerable addition has lately been made upon the ground between the College and the Imperial Institute in the shape of the new concert hall, examination hall, and other apartments [July 20, 1901, with plan and section and part elevation of the interior] opened on June 13, 1901, with Sir Hubert Parry as director, and erected by Messrs. G. H. & A. Bywaters after Mr. Sidney R. J. Smith's designs, which had been selected in competition, Mr. Belcher, A.R.A., being the assessor. The Royal School of Art Needlework was first established in 1872 in Sloane-street, and three years afterwards was removed to temporary premises adjoining the Technical Institute. On June 23, 1899, the King laid the foundation-stone of the new buildings [August 12, 1893, and June 24, 1899, front and side elevations and plans] built by Messrs. G. H. & A. Bywaters, of which Mr. Fairfax B. Wade is the architect; the materials are, externally, Portland stone and blue pennant for the lower story, 2-in. Bracknell bricks for the walling of the principal story, and Portland stone for the upper portion, with green slate for roofing. The site is that of the former India Museum on the west side of Exhibition-road. Between the Natural History Museum and Imperial Institute-road stands the new Royal College of Science [May 5, 1900, with three plans] by Mr. Aston Webb, A.R.A., which has a total frontage, 830 ft., equal to that of the Imperial Institute directly opposite, and connects the Science Galleries. With Mr. Collcutt's concurrence, the entrances into the College museum galleries are, in their general character, a repetition of the advanced ends of the Institute, and screens across the road connect the opposite blocks—a happily-conceived treatment.

NOTABILIA.

Knightsbridge.—Buildings on the sites of Nos. 1-7, Lowndes-terrace, and 1-3, Seville-street, for Messrs. Woolland Bros., 1896-9—Mr. H. L. Florence; premises in Seville-street for Messrs. Harvey, Nicholls, & Co., 1898, and on the site of Nos. 19-21, High-road, 1898—Mr. C. W. Stephens; Knightsbridge Market—William Hosking (1800-61); Park-mansions, Knightsbridge Green, with the adjoining Windsor Castle Restaurant and Arcade, 1900-1—Mr. G. D. Martin; Prince's Club, 1850 (from Hanover-place), opened May 18, 1889, built by Peto Bros. on the site of Humphrey's Hall—Mr. E. H. Bourchier; flats on the site of No. 1, South-place, 1899—Messrs. Boehmer & Gibbs; Phœnix floorcloth factory, founded in 1754 by Nathan Smith, the first of its kind in London, burned down in 1794, rebuilt, and again in 1824; All Saints' Church, Ennismore-gardens, 1846-9—Lewis Vulliamy (*ob.* 1871), decorated by Owen Jones, and since in sgraffito by Mr. Heywood Sumner; Ennismore-gardens, 1848-50, named after Lord Ennismore, who lived in Kingston House; No. 49, Prince's-gate, the late F. R. Leyland's, main staircase from Northumberland House, Charing Cross, the dining or "Peacock" room, decorated by Mr. J. M. Whistler; the screen between the two salons on the first floor, in brass and walnut wood, by Mr. R. Norman Shaw; the (old) Cavalry Barracks—J. Johnson.

Kensington.—Victoria and Albert Museum: decoration of the Oriental galleries—Owen Jones; two frescoes of the Industrial Arts as applied to Peace and to War—Lord Leighton; decoration of the refreshment-rooms—Sir E. J. Poynter; bust of Captain Fowke—Woolner. Royal Albert Hall, 1890—Mr. F. Hemings. Queen's-gate: St. Augustine Church, 1870-6—W. Butterfield; the four clearstory windows in chancel, and the stained glass including the figures of the twelve Apostles in the four great west lancets, 1880-6, by Alexander Gibbs; a block of mansions, 1856—C. J. Richardson; some other houses, 1859-60—John Tarring (*ob.* 1875); Nos. 171-5, flats [January 26, 1901, plan]—Mr. Paul Hoffmann; Nos. 181-2-3, flats, Mr. H. Lovatt, contractor—Mr. Delissa Joseph. Christ Church, Victoria-road, 1850-1—B. Ferrey; enlarged by his son, B. E. Ferrey (*ob.* 1900). Kensington Dispensary, Church-street, 1899—Mr. J. Gordon Stanham. Carmelite Fathers' Church—E. W. Pugin; the Monastery [July 10, 1886]—Goldie, Child, & Goldie. St. Paul's Church, Vicarage-gate [November 30 and December 21, 1889]—Mr. Arthur Baker; Essex Unitarian Chapel, the Mall, 1886, replacing Essex-street Chapel (now Essex Hall), Strand—T. Chatfield Clarke & Son; labourers' dwellings, the Mall—Sir Morton Peto; Bullingham House, Orbell's-buildings [October 22, 1899], where Sir Isaac Newton lived and died, pulled down in 1895 for a block of flats in Pitt-street. Sir James South's observatory, dome 36 ft. diameter, by Brunel, stood behind Observatory-avenue; South died there on October 19, 1867. Campden Hill-court—F. T. Pilkington (*ob.* 1898), completed by his son, Mr. E. C. Pilkington; Campden House (built *circa* 1612 for Baptist Hicks, first Lord Campden), burned on Sunday morning, March 23, 1862, and rebuilt; flats and houses since erected on the garden, 4 a. Sheffield House stood opposite the east wall of the garden of Campden House; the barracks, in Church-street, on site of the King's forcing-grounds; Ken-

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sington gravel-pits, at north end of Silver-street. Pitt-street and Duke-street, formerly Took's-lane. The High-street: Drinking fountain—Mr. H. W. Mackinney; Nos. 197-203 and 225-7—Mr. W. L. Eves; No. 27 [July 27, 1901], built in 1897—Banister Fletcher & Sons; premises for John Barker & Co.—A. M. Peebles (*ob.* May 21, 1891), enlarged in 1900-1—Mr. Pilditch; Nos. 99-103—Mr. Josiah Houle (1892); Parochial Mission Hall and Infant Schools, 1894 (Mr. W. Nash, builder)—Mr. T. Phillips Figgis; Public Library opened on November 29, 1889. Flats on sites of Nos. 33-43, Abingdon-villas, Nos. 1 and 2. Shaftesbury-villas, and in Allen-street, 1899-1900—Messrs. Palgrave & Co.; London, City, and Midland Bank, No. 16, Leonard-place, 1899—Mr. W. W. Gwyther; the White Horse, rebuilt as the Holland Arms. St. Barnabas Church, Addison-road—Vulliamy, 1828-30 (west window by O'Connor); St. John the Baptist Church, Holland-road, begun in 1876—James Brooks [May 23, 1885, interior; April 23, 1892, west front; and June 29, 1895, the screen, by Mr. J. E. Tayler-son]. Palace Mansions, Addison-road Bridge—Mr. F. Hemings, 1892. National Agricultural Hall, since Olympia, the two halls completed in 1886 after designs by H. E. Coe (*ob.* December 10, 1885), upon whose resignation by reason of ill-health, James Edmeston was appointed architect; Mr. M. am Ende and Mr. A. T. Walmisley, engineers, designed the great iron roof described and illustrated, with details, in the *Builder* of December 31, 1887: see also our illustrations of October 3, 1885, and May 29, 1886; Lucas & Son's general contract amounted to 131,573*l.*; Messrs. Handyside & Co., of Derby, contracted for the ironwork. New Post Office Savings Bank, begun in June, 1899—Mr. Henry Tanner (estimated cost of the buildings for 7,000 clerks, 180,000*l.*; site cost 45,000*l.*); Kinder-garten Training College, Talgarth-road, new wing, 1895—Mr. J. S. Quilter; Fitzgeorge-avenue, begun in February, 1899, Mr. H. Lovatt, contractor—Mr. Delissa Joseph (opened by the Lord Mayor and Sheriffs on January 6, 1901). Royal Albert Hall, iron roof—R. M. Ordish. Parish church memorial lych-gate and cloister, 1890. Kensington Gardens: St. Govor's well, walled and stepped by Lord Llanover, 1856; St. Agnes well, at foot of Buck Barn Hill.

South Kensington.—Churches: St. Peter, Onslow-gardens, 1867—C. J. Freake; St. Stephen, Gloucester-road, 1865—Joseph Peacock; St. Cuthbert, Philbeach-gardens, 1884-7, decoration of interior—Mr. Cyril E. Power; tower, porch, vestibule, colonnade, and narthex, Church of the Servite Fathers or Servants of St. Mary, Mr. George Porter's tender, 4,804*l.*, 1893—Mr. Jos. S. Hansom.

Parish Workhouse and Infirmary, Marloes-road: administrative block and ward pavilions, Messrs. W. Johnson & Co.'s tender, 35,560*l.*, and Messrs. Stimpson & Co.'s tender, 11,866*l.*; and nurses' home; buildings, machinery, and plant for electrical lighting by Professor Robinson, 1892-1900—Mr. T. W. Aldwinckle; Albert-court—Mr. R. J. Worley; 31, Courtfield-gardens—Sir G. G. Scott, who died there on March 27, 1878; No. 5 and other houses in Collingham-gardens [July 30, 1898], and Nos. 39 (1883) and 43, Harrington-gardens [November 6, 1897]—Messrs. Ernest George & Peto; Sussex-place, residential chambers, 1896—Mr. W. H. Collbran; No. 7, Gloucester-terrace, art studios for Messrs. Elliott & Fry (C. E. Fry & Son) [October 9, 1886]—Mr. W. Flockhart. Hale, or Cromwell, House, pulled down in 1853, on the south side of Cromwell-road, where is now Queensberry-place. Coleherne House (*temp.* Charles I.), at the corner, west, of Richmond-road and Redcliffe-gardens (formerly Walnut Tree-walk). Orford, afterwards Gloucester, Lodge, 6a., pulled down in 1852, the home of Maria, Duchess of Gloucester, her daughter Princess Sophia, and George Canning; on the site of the Florida Tea Gardens, in Gloucester-road, opposite the railway station.

Earl's Court.—Churches: St. Jude, Collingham-road, on the Gunter estate [July 9, 1870]—George and Henry Godwin; St. Matthias, Warwick-road, 1870—Hakewill; St. Philip, Earl's Court-road, 1857—Thomas Johnson. Barkston Gardens, 1886, on site of the house and grounds bought by John Hunter in 1764. The Exhibition grounds, 15 a., bought for 18,000*l.* by the District Railway Co. from Monsignor Capel.

STAINED-GLASS PANELS. — Messrs. Gustav Schulze and Jost send us (through their London agent Mr. Albert Becker) some illustrations and specimens of their ornamental stained-glass panels, apparently mainly intended for domestic work or for office buildings from the prevailing subjects and character. The glass is fixed in double-sided massive metal glazing, which shows excellent and strong workmanship, fitting it for such situations as doors in business buildings, where panels are subject to a good deal of strain from constant swinging of the doors. Of the more important designs we can only judge from the monochrome illustrations in the illustrated catalogue, which does not give the colour. The style of the designs is in the modern German taste, with which we have no sympathy, and which they will find will not be liked by English architects; but of course any style of design can be carried out in the process, as far as general lines are concerned.

LETTER FROM PARIS.

THE work on the Basilica of the Sacré Cœur at Montmartre has already cost 35 millions of francs—1,400,000*l.*—and this sum will probably be doubled by the time the last stone has been fixed. The foundations and the lower portion of the bell-tower are now completed, but the upper portion, which will rise about 55 ft. above the summit of the dome of the church, will take another two years to complete. The decoration of the interior of the monument is rapidly advancing; the chapels of St. Louis, of the Army, and of the Queens of France are already filled with magnificent mosaic panels; the dome has been decorated with four sculptural groups representing the Evangelists. The artists and clergy who have collaborated on the building have been honoured by their busts being placed at a certain height just below the windows of the dome. These are the busts of the sculptors Barrias, Fagel, Michel, and Noel, and the cardinals Langenieux, Richard, and Guibert, the completing architect Rauline, and his collaborator Moreau.

The Municipal Council has terminated its session by passing a vote for a new Metropolitan line, of which M. Berlier is to be the engineer. This line, nearly 6 kilomètres in length, will connect Montmartre with the Mont-Parnasse railway terminus. It is to follow the line of Rue Houdon, Rue Pigalle, Rue Blanche, Place de la Trinité, Rue St. Lazare, the Arcade Pasquier, Rue Boissy d'Anglas, the Place de la Concorde, crossing the Seine below the Pont de la Concorde, and then taking the line of Boulevard St. Germain and Boulevard Raspail, Rue and Place de Rennes, Rue d'Odessa, and Boulevard Edgar Quinet. The line will be very deep beneath the ground, varying from 8 mètres to 38 mètres, with lifts for the public at fifteen stations. Two branches, one from the Gare St. Lazare to the Porte St. Ouen, the other from the Gare Mont Parnasse to the Porte de Versailles, will complete the system. The work will be commenced shortly. The prolongation of the Rue de Rennes to the Seine will also be commenced shortly. The new portion of the street will cross the buildings of the Institute, including the principal court in which are situated the studios of the Academicians, that of M. Fremiet among others. A bridge over the Seine below the Pont Neuf will connect the new road with the Rue de Louvre. The cost of this bridge, which is to be of a monumental and decorative character, is estimated at 3,000,000 francs.

It has been proposed to transform the Hotel de Païva into a Mairie for the 8th arrondissement, a scheme which has met with violent opposition from the inhabitants of the Champs Elysées, who do not wish to see a business building established there. Other strong objections have been raised on account of the objectionable associations connected with the building. It is now proposed to establish the new Mairie in the Rue de Penthievre on the site of an Infantry barracks, which can be provided for in some other quarter if the State consent to the arrangement.

The Prefect of the Seine has at last settled the question of the Petit Palais. It is to be named Palais des Beaux Arts, and like the Galliera and Cernuschi Museums, it has been placed under the administrative direction of M. R. Brown, Inspector-in-Chief of the Fine Art Department of the municipality; and M. Georges Caïn, Curator of the Carnavalet Museum, has been commissioned to arrange there the art collections now at Auteuil and elsewhere. Besides the permanent museum, the palace will be a place for temporary exhibitions, for which there are numerous applications—probably the first one will be the designs for street signs, which has been suggested by M. Delaille. This exhibition will probably take place in the spring, and will include not only models of signs proposed to be put up in the Paris streets, but a collection of ancient examples from the Carnavalet Museum.

The bust of the late Felix Tisserand has just been placed in the antechamber of the Institute, opposite to that of Chateaubriand. Tisserand was director of the Observatory of Paris and member of the Academie des Sciences; the bust is the work of M. Maillard.

The well-known Grosse Horloge at Rouen is in a dangerous state of dilapidation, and the Municipality and the State have agreed to put the work into a thorough state of repair at their joint expense.

The printed list of the winners of medals and diplomas at the 1900 Exposition is now being issued, and occupies 1,500 pages. Five thousand medals and diplomas have already been despatched to their owners, but there are still about 15,000 to send off. M. Pickard has commenced his report on the Exhibition of 1900.

Much talk is made about the two fissures which have been discovered in the stonework of the façade of the new Opéra Comique, on the Place Boieldieu. The architect, M. Bernier, has been much blamed, but according to him these fissures are merely local and have not the slightest importance as regards the solidity of the façade.

The auction of the ground now occupied by a portion of the old Marché du Temple was not successful, there being no offers above the starting sum.

The inauguration of the new Victor Hugo Museum in the buildings of the Place Royale—now Place des Vosges—will not take place on February 26 next as proposed. The installation will not be complete by that time, and the hoped-for inauguration to take place during the fêtes to celebrate the centenary of the birth of the poet will have to be postponed. The delay is put down to the slackness of the authorities, and various difficulties with the late occupiers of this portion of the building. The centenary fêtes, however, will not suffer. The monument to Victor Hugo, now being completed by M. Barrias will be duly unveiled on February 26. A great commemoration fête will take place in the afternoon at the Panthéon, and a representation of one of Hugo's dramas at the Théâtre Français in the evening.

A small fire at the Palace of Versailles has called the attention of the authorities to the fact that this marvellous museum of decorative art and history is entirely unprovided with any efficient provision against danger from fire. The Prefet of the Seine and Oise Department has requested the public powers to inquire into the matter with all urgency.

The Court of Appeal at Paris has just acquitted MM. Mattrat and Galeron, the contractor and architect respectively of the foot-bridge of the Globe Celeste, the fall of which caused so many deaths during the Exhibition. The court, however, confirmed the decision of the former court as regards the responsibility of M. Tedesco, the engineer of the foot-bridge.

The director of the Gobelins Tapestry Manufactory has decided to reproduce in tapestry Botticelli's well-known picture the allegory of spring. A copy is being made from the picture in the Museum at Florence, and the tapestry work will be commenced at the Gobelins as soon as the copy is completed.

The new Crèche of Vincennes was inaugurated a few days ago. The building has cost about 6,000*l.*, a third of which was obtained from the taxes on betting clubs, and the rest from public and communal subscriptions. The architect is M. Fromont, architect to the Town of Vincennes, and the building is said to be arranged in such a manner as to make it one of the most modern of this style of institution.

It is very probable that the additions proposed by M. Puech to the terms of the law of 1793 concerning copyright in artistic work will be passed by the French Government. The new terms consist in an addition to the first article of the law of 1793; after the words "authors of all kinds of writings, composers of music," the words "architects, sculptors," are to be added. It is also added, "the same rights apply to sculpture of ornaments, whatever may be the distribution or the merit of the work."

The jury for the "concourse de façades" of houses built in 1900 is now making its visits of examination to all the buildings inscribed for the competition. There are fifty competitors this year, as against seventy-one for the last competition.

There is a little difficulty concerning the arrangement of the next Salon at Paris. M. Roujon, the Minister of Fine Arts, has informed the Société des Artistes Français that the Grand Palais of the Champs Elysées cannot be put at its disposal before April 14 next, owing to its occupation by the Concours Hippique. M. Bougoereau, the President of the Société, finds the time too short for the necessary work of installation before the opening day of the next Salon, and it is said that the Société will renounce holding the Salon of 1902 if the above date is maintained.

The Société Nationale des Architectes de France have elected M. Fernoux president

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M. Bouhon vice-president, and M. Christie secretary, for the year 1902.

The Paris Municipal Council has decided to invite the public authorities to consider the scheme of installing two works in the Seine Department for the combustion of domestic refuse. The number of rag-pickers who each morning ransack the boxes of refuse which each householder is obliged to place in the street in front of his house each night, or place in an available position in his courtyard, are up in arms against this scheme.

The industrial exhibition at the Galliera Museum last year had excellent results, and was of real value to French artists. Next April another exhibition will be opened there consisting of ceramic work, wood-carving, stained glass, and bookbinding. It is intended in future that each exhibitor at these exhibitions should furnish drawings of the objects he has exhibited, which will constitute a permanent exhibition of designs in applied art.

Early in the year, probably in February, an exhibition of the works of Falguière will be held at the Ecole des Beaux Arts, which will include sculptures, pictures, drawings, and models, collected by the widow of the artist and his friend, Paul Dubois.

The interesting "Musée de l'Opera," which has been completely rearranged, will be open to the public in a few days. Among other objects it will include an interesting collection of reproductions of old stage scenery, with its decorations and its primitive machinery.

M. Bonnier, the architect to the Palais de l'Elysée, is continuing the decoration undertaken by his lamented predecessor, M. Chancel, and MM. Carlier and Guilbert have just finished the models for two figures representing "Les Danses Anciennes." These statues, which are to be executed in marble, are to decorate the lawns behind the Avenue Gabriel.

The number of statues in Paris goes on increasing. That of Balzac, by Falguière, which has been refused a place in the Palais Royale, because the Metropolitan Railway Station is in the way, is now to be set up in the Boulevard Haussmann at the end of the Rue Balzac, and near the house of the great novelist. The statue of Gavarni, the caricaturist, is to be raised by public subscription, but no place has yet been found for it. The statue of Gramme, the electrician, is to be set up alongside of the Conservatoire des Arts et Métiers. It is the work of M. Mathurin-Moreau. We must not forget to mention the porcelain tower, which the Sèvres Manufactory is commissioned to execute, to replace the erection called the Lantern of Demosthenes in the Park of St. Cloud, which was destroyed in the war of 1870. The new erection, from the designs of M. Sandier, the Director at Sèvres, will be a great deal higher than its predecessor. It will be in circular form, 8 metres in diameter and 45 metres high. It will have seven stories with a circular staircase copied from that at the Château de Chambord. The 30,000 pieces of which the tower is composed will be done in 100 batches, and take five years to prepare. They are all to be of stoneware, with polychromatic decoration on the exterior. The work will certainly not be completed before 1907. We may mention also the new seal of the University of Paris, the model of which has just been completed by M. Chaplain. It bears on one side a view of the Sorbonne, and on the other a group of three personages collected under a portico; the central figure personifies the University, under the figure of a woman in a Doctor's cap and gown, and two young students, boy and girl, listening to her instructions. The figure of the girl is a sort of official indication of the admission of women to scientific instruction, and their right to assume the title of either Doctor or Avocat.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—A meeting of the Royal Institute of British Architects will be held on Monday next, the 6th inst., when a paper will be read on "Two Ionic Capitals in the British Museum," by Dr. A. S. Murray, Keeper of Greek and Roman Antiquities at the British Museum, illustrated by lantern slides.

CEMENT IN NORTH FORMOSA.—Writing last month on the trade of North Formosa, Mr. Acting-Consul Wawn incidentally remarks:—"The import of cement during the year 1900 was valued at 23,339*l.*, all of which came from Japan. I am informed, however, that the Japanese are now beginning to take more of the Green Island Cement Company's production, it being much superior to the Japanese-made article. The price of the foreign company's cement has been reduced till it is almost as low as the Japanese."

Illustrations.

WESTMINSTER ROMAN CATHOLIC CATHEDRAL.

SINCE the Houses of Parliament there has been no such remarkable building erected in London as the new Westminster Cathedral. It would be premature to enter upon a detailed account or criticism, or to speak of it as an accomplished success, for from the nature of the interior, which, in the architect's estimation, is the most important part of any church, it cannot be finished for many years to come. But the scaffolding surrounding the exterior is fast vanishing—sufficiently so to allow of the view presented to our readers being made.

It is unfortunate that it is impossible to get further away from the building, which is closely surrounded by lofty houses on three sides. The apse and flanking turrets compose with great effect, though the archbishop's palace shuts off the best point of view. The inside—at present a tremendous pile of naked brickwork, crowned with the four great saucer domes—is most impressive, even as it is, without the marble veneer and mosaic that is eventually to adorn it. It will be possible for the public to view this when it is thrown open for worship shortly after the Coronation, and until the interior is seen no opinion should be expressed upon the merits of the whole. In our opinion it is a building likely to be regarded by future generations as marking an epoch in English architecture. The plan is eminently suited to a great congregational service; the acoustics are said to be perfect; and the style of architecture is most suitable from economical reasons to a great church. It is at present the one building of absorbing interest to students and to many practicising architects besides. Its claim upon our attention is not based upon any mere striking originality, but upon the effective effort of a great mind to solve a problem that is always new and always surrounded by the many cramping conditions of site, requirements, and cost.

WINDSOR CASTLE.

IT is unnecessary here to describe in detail the various buildings of Windsor Castle or to enumerate the many scenes in the history of England from the time of the Conquest to the present that its walls have witnessed. It seems fitting, however, at the beginning of a year which will be marked by the gorgeous ceremonial of the Coronation, that a view of this most imposing of Royal residences should be included in the New Year's number of this journal.

Much work was done during the last century to which architecturally exception might be taken, but the general effect of "scale" remains, and the middle and lower wards are particularly full of interest. The view chosen is that from the meadows on the north-west between the town and the river. There is a fine contrast between the solidity of the Curfew Tower and the walls that flank it, and the delicacy of the detail of the chapel of St. George and the Garter Knights; these, together with the great mass of the Round Tower or keep in the background and the group of still picturesque houses below the Castle walls, make a group which it would be difficult to surpass. R. W. PAUL.

THE TOMB OF MAXIMILIAN I., INNSBRUCK.

THIS imposing conception is due, in the first place, to an Augsburg artist, Guglielmo Sesselschreiber, though the work was mainly carried out on his lines by other artists.

The idea of an avenue of figures leading the eye up to the principal object in the composition is a very appropriate and striking one; possibly derived, in some remote way, from the Egyptian avenue of sphinxes, or the Druid avenue of stones.

The figures are mostly by Michael and Stephen Godle, Lendenstreich, and others. Peter Vischer was among the contributors. The statues are in bronze.

In the centre, towards the east, is Maximilian, in imperial robes and crown, kneeling on an elevated sarcophagus. At the angles are small accessory figures representing virtues. The sides of the sarcophagus are adorned with reliefs, representing scenes from the life of Maximilian. All this structure is surrounded by an elaborate grille of German character.

On the north and south sides, standing between the columns of the nave, on a raised plinth, are twenty-four majestic figures, and on the east side four more. These represent ancestors and relatives of the illustrious deceased. Among the former, it is interesting to note the inclusion of "King Arthur of Britain." The figures stand in sets of four, the "Clodwig," "Hapsburg," and "Cimburgis" groups, &c.

The figures bear torches, sceptres, swords, batons, &c., besides elaborate escutcheons. The extraordinary armour and costume of these statues, their lifelike action and characteristic portraiture, render the *tout ensemble* most singular and impressive. A. C. C.

SOMERSET HOUSE BEFORE THE EMBANKMENT.

THIS drawing was made by Mr. W. Monk, on the basis of old prints, to show the effect of Sir W. Chambers's principal architectural work before its river front was intruded upon and partially hid by the Thames Embankment.

It is given in connexion with the article on Sir W. Chambers which will be found on another page.

THE GATEWAY TO THE ALBANY, AS ORIGINALLY DESIGNED BY CHAMBERS.

THIS illustration is from a large unpublished water-colour in the Soane Museum, and shows the design for the entrance to the forecourt of what afterwards became the Albany Chambers, but was originally designed by Sir W. Chambers as a town house for the second Lord Holland, under the title of Piccadilly House, and in 1770 sold to the first Viscount Melbourne, when it took the name of Melbourne House. In 1804 it was transformed into the Albany Mansions and additions made to it in the rear for further accommodation, this work being carried out by Holland.

There appears to be just room for doubt whether this gateway was actually carried out or not; at least we can find no documentary evidence of it beyond this drawing; but Mr. Birch, the curator of the Soane Museum, is of opinion that it represents what was there and has been removed.

We are inclined to the same opinion, because the drawing is grouped in the Soane Museum along with a set containing a large water-colour view of the quadrangle of Somerset House as it stands, and other views of buildings known to have existed; and the original of this bears more the appearance of a drawing taken from the actual building than of an imaginary one to exhibit a design. Moreover, considering the usual practice of that day, it seems hardly likely that a nobleman's town house would stand for half a century or so with an open forecourt in front of it, and no gate or barrier.

The wall shown on the left of the drawing is that of the courtyard of old Burlington House; the realistic manner in which it is shown supports the idea that the drawing represented actual work *in situ*.

VARIOUS WORKS BY SIR WILLIAM CHAMBERS.

THIS sheet of illustrations shows examples of some of Sir W. Chambers's work. Trinity College, Dublin, and the "Marino," Clontarf, are well known, and have been illustrated before in our pages.

Duddingstone House, near Edinburgh, is less familiar. We give a view of the hall and staircase, and an illustration of one of the chimney-pieces (a class of ornamental design of which Chambers did a good deal), from photographs which the present proprietor of the house has kindly allowed us to have taken.

The elevation and plan of the house, reproduced from the "Vitruvius Britannicus," will be found on page 5.

VARIOUS DESIGNS AND DETAILS BY SIR WILLIAM CHAMBERS.

THESE designs are photographed from drawings in the Soane Museum, where there is an

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interesting though very miscellaneous collection of drawings either made by Chambers or made under his direction and for the working out of his designs.

A great many of these are not named or described in any way except by the collective title of the portfolio which contains them. Thus Nos. 2 and 4 are from a collection described in a specially designed decorative title as "Designs for Gateways, Garden Buildings, &c." Both of them, as far as general style is concerned, might pass for either mausolea or park pavilions; in No. 2, however, the urns in the niches have a funerary appearance. At the back of the sheet on which No. 4 is drawn is a note to the effect that "there should have been a tablet with an inscription to Valour, Beauty, and Science," which points to the erection being intended to be in some way commemorative.

No. 5 is one of four elevations, on one sheet, of the four walls of a library, and is interesting as an attempt to render the bookcases a more integral portion of the design of the room than is generally the case.

The remaining drawings are from a portfolio labelled "Somerset House." Nos. 1 and 6 are designs for the treatment of windows; No. 3 is inscribed "Elevation of the Royal Academy Great Stair;" apparently one arch through or behind which the stair was to run. The writing on the drawing refers obviously not to the drawing itself but to something else which was to be combined with it; the upper inscription reads "Entablature continued without a break and a tablet running through the bedmould and the [word illegible] moulding of the architrave." The lower one, within the arch, is a direction to the effect that there is to be a "plain arch with impost, archivolt, console, [word illegible] and festoons, the under part of the impost to range with the top of the flat part of the fifth rustick." The notes are interesting because they throw a light on the way of working in those days, indicating that the general character of the details required was so well understood that it was only necessary to mention them in writing.

Nos. 7 and 8 are decorative details for Somerset House. No. 7 is evidently intended for a room in connexion with the naval administration, from the nautical character of the details; No. 8 is a frieze for one of the doors of the Royal Academy rooms.

ANTWERP AT THE CLOSE OF THE SIXTEENTH CENTURY.

WHEN arriving at Antwerp, and, for the first time, seeing the fine view of the town from the Scheldt, it must often occur to the visitor to wonder what kind of buildings occupied the "river front" in the Middle Ages before the vast modern hotels, wharves, and warehouses were erected, forming such discordant elements, and contrasting so disagreeably with the fine skyline of ancient church towers and gables. I always thought over this matter until I came across two scarce and very interesting old books, which at once showed me how much had been lost, in a picturesque point of view, by the alterations made during the last two centuries, especially at the close of the eighteenth and commencement of the nineteenth. Down to that period the general aspect of the view had remained pretty much as in earlier times. The French Revolution seems to have created more havoc here than in the land which originated it. If we want to study out what has been lost at Antwerp we should consult such books as "Brabantia Sacra et Profana," or Eitzinger's "De Leone Belgico." The former work is dated 1696, and illustrated by L. Voisterman, Harrewyn, Wencelaus Hollar, &c., but is very rare, and the copy I possess is the only one I have ever seen. The latter book, though earlier in date, is to be met with in several old collections. It has upon its inner "title page" the curious looking date CIↃ,IↃ, LXXXIII. (1583).

There is a third book called "Les Delices de Brabant," which is not scarce; the illustrations consist of some very inferior copies of "Brabantia Sacra" and a few original drawings of little merit.

Judging from these three works, we can trace the alterations which have been made in the river wall. Originally there were two towers near the cathedral; one was octagonal and crowned by a series of gables and a spirelet, rather lofty. The other, more to the south, was circular in plan, solid, and sturdy, crowned with an extinguisher top. Between these the ancient moat flowed into the Scheldt beneath two arches over which the ramparts were carried. The two towers are indexed in one of the views as "Vercooper's Tooren" and "Backer's Tooren." To the south of the latter extended the "Hüy kay" and the "Bierhof." Against the latter was a large solid gateway, shown in one of Eitzinger's illustrations, and a little beyond it, to the south, stood the great abbey of St. Michel, with its fine church, shown in a view in "Brabantia Sacra." It was a large, lofty, cruciform structure, supported with flying buttresses, with a lantern-crowned tower at the end of the north transept. The cloisters and chapter-house are shown to the south; the latter had three "rose windows" at the eastern end. The principal gate was to the east, and consisted of a large archway flanked on either side by pierced arcaded walls, the openings filled in with ornamental ironwork. There were Doric or Tuscan rusticated columns between the openings, and large statues both on the pediment and the wing walls. Nothing whatever remains of this splendid building. The wall and its towers continued past the west end of the church until it reached the "Casteel," which stood upon the site of the present "Citadel," and was a picturesque group of buildings with a church and numerous windmills. This closed the view to the south. Returning to the cathedral, to the north the second moat ran into the Scheldt a little way beyond the "Vercoope tower"; on its south bank stood the ancient church of St. Walburg, called "De Borch Kircke," with a lofty western tower and slate spire. It has, however, entirely disappeared, with the moat, which was constructed by Henry I., Duke of Brabant, in 1201, to enclose the suburb which had then grown important. In 1314, however, it became necessary to construct a new moat and fortifications; and in 1543 Charles V. built a new town round the old one, and surrounded it with a moat and walls. The only very important building in it was the Hanseatic Hall, with its lofty tower.

Several later additions have been made, but until a few years back the plan was not materially changed, as may be seen by comparing Eitzinger's plan with that given in Murray's "Handbook" for 1858.

Eitzinger gives in his views drawings of the great Spanish ships which were then at Antwerp, especially one which belonged to the Duke of Alva. This was a fine example of naval architecture of the period, and I have introduced it into the view in the position where it would have most probably have floated.

H. W. BREWER.

ON THE SCHELDT IN THE TIME OF VAN ARTEVELDE.

DURING the campaign of the French and the Earl of Flanders against Philip van Artevelde, which ended in the defeat of the Flemings and the death of Artevelde at the battle of Roosebeke (1382), it was part of Artevelde's tactics, as represented in Sir Henry Taylor's great poem, to block the Scheldt at different towns on its banks, so as to prevent the French from using the river for the transport of their supplies.

In making this sketch of an imaginary mediæval bridge, I have supposed it to be one of the bridges thus blocked by Artevelde's orders; a massive chain across one arch, a movable boom across the centre arch, which could be opened for the passage of friendly craft if necessary, and which suggests the idea of the "turnpike" in the quotation at the foot of the plate.

The iron grids or grates erected on the buttresses suggest the primitive method of lighting at night by fires. The heads on pikes over the gate may be thought out of keeping with the sway of Philip van Artevelde, who though a resolute was not (for those times) a cruel man; but if his captains were such rough diamonds as Taylor pictures them in the characters of "Van den Bosch" and "Roosdyk," any town under their immediate guardianship would probably have been made to furnish executions enough to keep up a good supply of this peculiarly mediæval form of gateway decoration.

That both Mr. Brewer and I should have taken the Scheldt as the scene of our imaginary pictures was an accidental coincidence.

H. H. STATHAM.

VIEWS IN OLD KNIGHTSBRIDGE.

THESE views are reproduced from drawings in the Crace collection at the British Museum, all except the long one at the top of the page, which is from a portion of Salway's splendid collection of elevations and plans (in the British Museum manuscript-room) made for the Turnpike Trust, and in which every house, post, hedge, and every detail, is plotted in plan and elevation along some miles of road, and shown in drawings finished with the greatest delicacy and precision. The work is worth examination merely as an example of beautiful draughtsmanship.

The portion which we have reproduced specially bears on the subject of the article on Knightsbridge in the present issue, as it shows the actual position of the bridge over the West Bourne, which ultimately gave its name to the whole district. The other places shown are nearly all referred to in the article on Knightsbridge. The view of St. George's Hospital is not properly within the scope of the article, as it dates from the eighteenth and not from the nineteenth century, but we thought it would interest some of our readers to see the line of what is now Grosvenor-place, as it appeared till nearly the close of the eighteenth century.

DESIGN FOR A TOWN HALL FOR ONE OF THE NEW LONDON BOROUGHS.

THE above was the subject set by the Royal Academy for the competition for the gold medal and Travelling Studentship in Architecture for 1901, which was gained by Mr. Bernard H. Webb with the design of which we publish the perspective view and the plan of the principal floor.

The following is the author's description of his intentions in the design:—

"The design was planned on the assumption that in London the public hall should be distinct from the official portion of the building. The public entrances to the hall lead direct from the back street, with lavatories and cloakrooms adjoining, official communication being provided from the main corridors on each floor. Public entrances and staircases from the side streets communicate direct on one side with the Rates Office and Accountant's department on the ground floor and the council chamber and committee rooms over, and on the other side, with the Surveyors, Medical Officer's, and Town Clerk's departments on the ground floor, and the Surveyor's and Electrical Engineer's drawing offices and the Mayor's suite of rooms over. A separate entrance and staircase communicates with the stage and public gallery of council chamber. Lavatory accommodation is provided on each floor off the main corridors."

We should add that in reviewing the R.A. students' designs two or three weeks ago we did an injustice to Mr. Webb in complaining of the inadequate cloakroom accommodation in his plan, being misled by the sight of two small apartments labelled "Cloakroom," which it appears were only intended as additional accommodation for certain occasions. It would have been clearer, certainly, if they had been labelled "Extra cloakrooms."

MONUMENT AT CHARTRES.

THIS monument, of which we give a general view and an enlarged illustration of the central group of sculpture, has recently been erected at Chartres to the memory of natives of the Department of Eure and Loire who fell in the Franco-German war. It is placed at the entrance to the "Promenade des Charbonniers," and consists, as will be seen, of an arch flanked by a curved screen wall. Over the arch is a central feature decorated with the arms of Chartres, Chateaudun, Dreux, and Nogent. Beneath the arch is the principal group of bronze sculpture, the work of M. Henri Allouard, consisting of a female figure symbolising France, waving a standard, and supposed to be pointing to the enemy. At her feet is a wounded officer still endeavouring to defend himself. At the extremities of the monument are placed two bronze figures, at the right an Artilleryman, at the left a Mobile, the work respectively of M. Loiseau-Bailly and M. Boverie. In front of the monument is a large semicircular basin of water into which two lion-head spouts discharge.

The architect who originated the general design is M. Nénot, the eminent architect of the new Sorbonne building. The monument, which was inaugurated at the end of October last year, is a fine example of the judgment

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and good taste which the French bring to bear on works of this kind, and the happy result of collaboration between architect and sculptors, whereby a work is secured which is a harmonious whole.

COLCHESTER TOWN HALL.

THE new town-hall at Colchester was on view to the public last week. The impression received from the actual building is very different from that conveyed by the drawings which we have been able to publish from time to time. These drawings were mostly prepared in competition, and, except for the clever planning, gave an impression of straining after originality, resulting—if we may so describe it—in a "jumpy" design. We hope the time is not far off when perspective drawings will be excluded from competitions, unless necessary to express a scheme unintelligible to the assessor in plan and elevation. In reality, Mr. Belcher, the architect of the Colchester town-hall, has, in our opinion, only just missed producing a great building; its defects are rather the architect's misfortune than his fault, due partly to the site and partly to the requirements.

The site is a corner one in a prominent part of the High-street, restricted in area, and with its frontages at an acute angle with each other. The requirements consisted of a Moot-hall, council-chambers and committee-rooms, law courts and police offices, municipal offices, and a public library. Our readers who studied Mr. Belcher's plans will remember the general arrangement of these requirements; he took advantage of the considerable incline down West Stockwell-street to get good rooms in the basement besides heating-chambers and stores. On the lower ground floor are the public library, the police offices and cells, strong rooms, and the weights and measures department. On the ground floor is the principal entrance from the High-street, leading into a spacious hall with municipal offices on right and left, with a fine marble staircase in the centre, under which is direct access to the law courts corridor, which has an entrance of its own in West Stockwell-street. The law courts are two moderate-sized rooms, exactly alike, panelled and furnished in unpolished oak, with great dignity of design and charm of detail.

The grand staircase leads to the council chamber and committee rooms on the first floor. An ample corridor runs the length of the building to right and left of the main staircase; on the High-street side are a fine suite of committee rooms capable of being thrown into one by sliding partition doors. The council chamber is fitted cleverly into an irregular quadrilateral, which is squared up and centralised by the use of detached columns and by the segmental arch at the upper end of the room, which enhances the dignity of the dais. The chamber is lighted by large windows of stained glass of considerable merit. The Chairman of the new Town Hall Committee and present Mayor, Mr. Wilson Marriage, presented "the Huguenot window," which commemorates the reception given by the town to the French Huguenots and Flemish refugees and the establishment by the latter of the weaving trade. Both the glass and design are very fine, the work of Messrs. Powell & Sons. The other windows are also very good in a simpler and more architectural way, and are presented by Councillor Claude E. Egerton-Green. Here we may remark upon the excellence of the glass throughout, including that in the Moot Hall, which is more or less descriptive of the history of Colchester, arranged by Mr. W. Gurney Benham. In most of the windows a plain background sets off the concentrated coloured portions with admirable decorative effect.

The Moot Hall has been placed upon the second floor—a bold idea. It measures about 30 ft. by 40 ft., with a barrel-vaulted roof supported on twelve pairs of detached columns, the order giving great richness and scale to the hall. The lighting is by the three handsome windows already referred to on the High-street side, and by a subdued top light. The Moot Hall is the crowning feature of the design; the marble staircase attracts you from floor to floor, the grasp of the planning and the mastery of detail giving interest, if not actual pleasure, at every turn. Throughout the scale is small but firmly held, plain wall space is cherished, and cornice and coffering most carefully studied. Here and there originality has been rather needlessly sought after in some comparatively unimportant detail, perhaps humanising the whole by an imperfection.

With regard to the exterior, we may say at once that it would have been better without the tower. The tower in itself is a fine piece of work, but there was no place for it on the site; it is choked by petty offices and by the roof of the main building. We do not blame Mr. Belcher for this—we do not know his opinion upon it. He had that most difficult problem, the combination, on practically the same elevations, of large and small requirements, with a monumental tower thrown in. If the result is not wholly harmonious, it is, as Mr. Shaw (the assessor) expressed it in his report, "a scheme of very exceptional merit . . . which will impress all as being not merely exceedingly well fitted for its purpose, but most original and striking as an architectural composition." Colchester is to be congratulated upon a building worthy of its antiquity, and also upon the extraordinary generosity of individual citizens in gifts for the enrichment and adornment of their municipal enterprise. They have contributed to a deeply interesting modern building—modern in its varied requirements, expressed with the lucidity that is art, whatever style it may be clothed in. The style has a slightly Genoese flavour, not out of keeping with the liberal foreign traditions of the city.

MOTOR VEHICLES FOR HEAVY TRAFFIC.

A GRADUAL and marked improvement in the construction and behaviour of motor traffic vehicles has been observed since the institution of the Liverpool trials, some three years ago, with the object of encouraging the development of heavy motor waggons suitable for trade and agricultural requirements. In the judge's report of the 1901 trials, the opinion is expressed that reliance may be placed upon the systems to which gold medals have been awarded, for regular employment in general haulage operations where due care and supervision are exercised. Amongst the vehicles taking part were two propelled by internal combustion engines using petroleum spirit. The chief drawback of these was the heavy cost of fuel per ton-mile as compared with that of solid fuel in steam-propelled waggons, but it is probable that this disadvantage would be more than counterbalanced in many cases by the ability of travelling considerable distances at speeds of from six to eight miles an hour with loads not exceeding two tons. The further adoption of internal combustion engines for heavy traffic will be largely dependent upon the utilisation of commercial forms of petroleum, under the varying conditions imposed by road locomotion, and without the creation of a nuisance. Solid fuel was chiefly used for the steam-propelled waggons taking part in the competition, and we are pleased to notice that the judges consider no risk of fire need attach to such vehicles by reason of discharges from the funnel, as the effective baffling of sparks, cinders, and dust has now been successfully accomplished. Moreover, it is stated that no nuisance need arise from the blowing-off of steam, as the firing can always be under adequate control.

So far as performance is concerned, it is now established that in good weather a motor waggon can average five miles an hour, thus bringing a journey of forty miles a day well within the practical limit. The vehicles to which medals were awarded are considered to be capable of going anywhere that a horse-drawn vehicle is ordinarily required to go, and to possess the advantage of being able to travel backwards with great facility—a feature of considerable help in entering and leaving many loading places. Gradients of 1 in 9 appear to be readily ascended, and short lengths of road as steep as 1 in 8 to be climbed without difficulty by fully-laden vehicles. In manœuvring and in ascending or descending hills, the judges consider the powers of control possessed by the driver are distinctly superior to those exhibited by the best types of horse-drawn vehicles. One undesirable feature is that on all but one of the waggons tested constant stoking is still necessary. This might be avoided by the adoption of automatic firing arrangements, which are to be desired for more reasons than one. The judges make lengthy comment upon the legal restrictions which at present interfere with the development of a most promising British industry. Motor traffic is placed at a disadvantage compared with horse-drawn traffic in the respects that the same load may not be carried, and that the width of the vehicles must be kept within certain fixed limits. The report recommends that a limit of 16 tons moving weight for any single motor vehicle shall be substituted for the present limit, which being on the tare alone has sometimes the absurd effect of rendering equal moving loads legal or illegal, according to the proportions existing between tare and gross weight. An increase of axle load could not cause injury to roads, providing the width of tyres were properly regulated. On the contrary, it would be of direct benefit, as the action of the steam roller demonstrates, and the extended use of motor waggons would reduce the serious damage done to highways by the pounding and scraping action of horses' feet. It is to be hoped that the report will bring home to the authorities the fact that restrictive enactments are now depriving the country of industrial facilities which ought to be enjoyed, and that they are preventing the development of motor waggons for military purposes, thus adding unnecessarily to the burdens of the taxpayer.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A meeting of the Edinburgh Architectural Association was held recently in the new rooms of the Association, 117, George-street. Mr. Henry F. Kerr, President, occupied the chair, and, referring to the minutes of the Council meetings, which reported upon what had been done in connexion with the proposed buildings at Edinburgh Castle, said he had seen the Town Clerk that day, and he had been told that the matter was not being lost sight of by the Town Council, and that nothing definite would be done until the Joint Committee of members of their Association, the Cockburn Association, and the Arts Club had been informed on the subject and given an opportunity of again expressing their views upon it. A paper was afterwards read by Councillor Mackenzie on "Ventilating and Heating." Incidentally he mentioned that eight or more persons often travelled in a single compartment of a railway carriage with the doors shut, so that they had only about 245 ft.—30 cubic feet per head—and he characterised that as a veritable death-breeding trap. He went on to say that some of the sleeping berths of the London trains, where a person was locked up for eight hours, were almost as bad, and that all that took place whilst authorities alleged that a healthy adult in repose required 2,000 cubic feet of fresh air for healthy breathing. The lecturer's strongest indictment, however, was made against the want of fresh air in the dwelling-house, and more especially in the bedroom, which most people thought should be as closely secured against any incoming air as it was possible to make it, and he was persuaded that more consumption and other diseases were contracted through foul air in bedrooms than in any other manner, by the lowering of the vitality of the body, and making it a fit breeding place for all kinds of infectious and other diseases. He next adverted to the ventilation of churches and public buildings, and, while admitting the desirableness of good ventilation in these, expressed some surprise that so much should be made of having to sit for one hour and a half in the week in a polluted atmosphere in the church when no objection was taken to sleeping seven hours per day in the poisonous atmosphere of the unventilated bedroom. He did not think the lower classes were much more to blame than the classes above them, as he often found the most deplorable want of education on this subject among educated people. Crowded schools should be as thoroughly ventilated as possible by mechanical means, and it was not there, he said, that economical ideas of cheapness should be entertained. Passing on to the second portion of his subject—namely, heating—he expressed his strong partiality for the open fire as the cheeriest and the healthiest means of heating and promoting ventilation. He admitted its want of economy as compared with the close stove, but with all its drawbacks he put the open fire first. In large rooms he would supplement the open fire by fixing hot-water

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radiators where most suitable, but condemned altogether the hiding of hot-water pipes or coils in cases or behind screens, where they could not be regularly cleaned. Putting the open fire first, Mr. Mackenzie put the gas-stove without a chimney last. That, he thought, was the worst possible means of heating. A gas-stove, vomiting out poisonous fumes into the atmosphere of a room, was nothing else than a poison manufactory, and should be prohibited by law. The fact of such a stove not giving off an offensive smell only added to the danger from the apparatus. He pointed out that when gas was burned carbonic gas must be given off, which, although not directly a poison, did not support life, and polluted the air. He went further, and said that often from imperfect combustion carbonic oxide was generated, the effects of which had often proved fatal. He believed gas had a great future before it as a heating agent, but he trusted that effectual means would always be taken to get rid of the fumes. He advised that, in estimating the amount of heating for any building, a basis of 25 deg. of frost outside should be taken, in order that when the cold weather came—though it might not come for years—the apparatus might be able to keep 50 deg. or 60 deg. Fahr. inside. Finally, he made allusion to the usual mode in which architects proceeded in getting three or four heating engineers to give schemes and estimates, which had no common basis, and which varied widely in cost, the upshot often being that the cheapest scheme was taken, which frequently turned out to be the dearest, because the worst, in the end.—*Scotsman.*

ROYAL INSTITUTE OF ARCHITECTS OF IRELAND.—On the 19th ult. the annual general meeting of the Royal Institute of the Architects of Ireland was held in the offices, 20, Lincoln-place. Mr. G. C. Ashlin, R.H.A., the newly-elected President, on taking the chair, thanked the members for the honour they had conferred upon him in electing him to one of the highest positions in the gift of the Institute. The President, in the course of an address, said that, coming after the long and successful presidency of Sir Thomas Drew, during which the interests of the Institute were so much advanced, he thought that his task would not be an easy one. Continuing, he deprecated the practice which had sprung up of late amongst public companies who had their headquarters in London in employing English architects in erecting buildings in Dublin. He recognised the difficulties in connexion with ecclesiastical work which were experienced in finding artificers here with the necessary equipment for carrying out the ideas of their clients, and to improve the present condition of affairs help had been promised by their public departments, and especially by the technical schools, and he thought that still further assistance might be given if prizes were offered at the Cork Exhibition for specimens of the work which were now in constant demand.—The secretary, Mr. W. Kaye Parry, read the annual report, which stated the satisfaction that has been felt at the inauguration of the Ulster Society of Architects, a body affiliated to their own, and formed for the purpose of organising the architects of the Northern province on the same lines as their own Institute. In consequence of the refusal of the Ennis Asylum Board, in the proposed competition for the extensive additional buildings, to appoint, as assessor, an architect who should have power to amend the faulty conditions of the competition, the Council advised the members of the Institute to abstain from taking part in the competition, and they were glad to say that the members loyally supported the action of the Council in this matter. During the year they lost no members through death, while, on the other hand, they had gained a considerable number of new members, the total now standing at 101.—Mr. J. Rawson Carroll proposed the adoption of the report, and pointed out the benefits which the Institute had secured for the members during the past year. Mr. William M. Mitchell, R.H.A., seconded the adoption of the report. Mr. W. Kaye Parry, in supporting the resolution, said the Council had decided to publish a little book giving an authorised list of architects' charges. The report was adopted. Mr. Batchelor, in the absence of Mr. Owen, presented the finance account, which showed that there was a balance of 66*l.* 5s. in hand. The report was adopted. The following were elected on the Council: Sir Thomas Drew, Messrs. W. M. Mitchell, J. R. Carroll, C. Geoghegan, F. Batchelor, R. C. Orpen, H. Pentland, A. E. Murray, G. Sheridan. In the evening the President and Council of the Institute gave their annual dinner in the Shelbourne Hotel. Mr. G. C. Ashlin, President, occupied the chair. After dinner Sir Thomas Drew, past President, passed round the loving cup. The Chairman then gave the toast of "The King," which was loyally honoured, the company singing the National Anthem. The Chairman next gave "Prosperity to the Institute." In doing so he said they commenced life early in the last century, and, in fact, it was nearly commensurate with the long reign of the late Queen. Their membership was increasing, and he believed that in the last year there had been an increase of from 10 to 20 per cent. The Institute had a great way to go yet before they reached their ideal. One of the suggestions thrown out at their meeting that day was that they should look forward in the immediate future to making some attempt at registration, and he hoped something would soon be done in that direction. He coupled with the toast the name of Mr. Charles Geoghegan. The toast having been honoured, Mr. Geoghegan replied. The Chairman also proposed "Our Guests," which was responded to by Father Murray, Dr. Swanzy, and Mr. V. B. Dillon.

ULSTER SOCIETY OF ARCHITECTS.—The annual general meeting in connexion with this society was held on the 18th ult. in Ye Olde Castle Restaurant. Sir Thomas Drew, President, presided, and in the course of a brief address congratulated the Society on the progress it had made and the good work it had already accomplished. Mr. W. J. Gilliland, Vice-President, afterwards submitted a report, which, amongst other matters, referred to the proposals of the Belfast City Corporation to regulate the "elevations of buildings," to which we refer on another page. Messrs. Seaver, Tulloch, and Lamont were appointed scrutineers, and declared the following elected:—As member, Mr. Jas. A. Hanna; as associates, Messrs. J. Bevin, W. C. Maxwell, and C. D. Patterson; as students, Messrs. D. Parkhill and J. Seeds. The following officers were elected for 1902:—President, Sir Thomas Drew, R.H.A.; Vice-President, Mr. W. J. Gilliland; hon. secretary, Mr. N. Fitzsimons; hon. assistant secretary, Mr. W. B. Fennell; hon. treasurer, Mr. Vincent Craig; Council, Messrs. J. J. M'Donnell, M. A. Robinson, F. H. Tulloch, W. J. Fennell, and Henry Seaver. The annual dinner was held in the evening, Sir Thomas Drew, President, in the chair. The toasts of "The King" and "The Prince and Princess of Wales" having been honoured, Mr. Gilliland proposed "The President," and in doing so he said that Sir Thomas Drew was exceedingly popular with his professional friends in Dublin. Sir Thomas they all recognised as being the great stronghold of professional architecture in Ireland, and he had maintained the dignity of his profession in every possible way. Their thanks were due to him for the position he had taken up in reference to the dignity of the profession, and also for the friendly interest he had taken in their society in the north. Without his enthusiasm, support, and sympathy they never could have attained to the position which they had done in the organisation of that society in such a short period of time. The President, in reply, said he had a great desire to see the profession with which he was connected in a better position in his native town, and he felt proud that the time had come when at last an organisation of local architects was an accomplished fact. Their society came before the public in a rather strong position, because it was indirectly allied with the Royal Institute of British Architects in London—a most powerful body, which had ramifications not only throughout Great Britain and Ireland, but also the Colonies. It had often been put before him that something should be done for Belfast, one of the greatest and most prosperous cities in the United Kingdom, in the way of having such an organisation. That happily had now been accomplished. If he might be permitted to allude to current affairs, he noticed they had already found themselves face to face with questions of very great gravity to their profession as well as to the public of Belfast; and he had no doubt when in time they came to be better recognised their organisation would be an exceedingly useful one, working in harmony with the Municipality. That was the case in Dublin, where there was a kindly feeling existing between the architects and the Corporation. In all the legislation promoted by the Dublin Corporation in which architects were interested they had invariably been consulted. In Belfast there was a question which affected them. A Bill had been promoted in Parliament which would in some points affect the practice of architects in this city, and there had been put into his hands that night for the first time a draft which was proposed. Among other things it stated:—"The Surveyor may disapprove of such elevations on the ground that they are, in his opinion, objectionable, or that in any respect they are not in conformity with the requirements or provisions of the existing local Acts or by-laws of the Corporation." This was certainly a most extraordinary clause, and, he feared, was drafted under a total misapprehension and mistake. The draftsman of such a clause could not possibly have conceived what the ultimate result would be and how it would affect architects. In the first place, could he have thought what a blow it was to the liberty of the free subject in this free kingdom? Municipal laws as regarded buildings were no novelty. Parliament had been hammering away at them for fifty years, and, after many amendments and new Acts, municipal legislation as to buildings was in a pretty concrete state. The City of London had a system which, with all its faults, was as nearly perfect as it could be. The Local Government Board of England had issued model by-laws, which had been adopted by even the smallest Urban Authorities in the smallest towns. While the great Municipalities of England had their legislation and their by-laws pretty well now in smooth working order, he ventured to say in no part of the King's dominions would such a clause as that proposed by the Belfast Corporation be found. It would be impossible. Those things which were really objectionable and offensive in property were regulated by the ordinary legislation in towns. The general powers given to Municipalities as to frontage lines and the widening of streets were quite sufficient, and worked very smoothly. Then, again, if such a preposterous clause as that proposed were adopted, who was the Surveyor that he should be censor of architecture any more than that of morals? What were his qualifications for the position? He was not an architect as a rule. He (Sir Thomas) should also be very sorry indeed to see a censor of architecture appointed, although he might be a distinguished architect. If such a thing were imposed it would be to the detriment of the architectural progress of the country. He hoped there would be sufficient good sense on the part of the Corporation of Belfast not to insist upon the proposed clause, and that a pen would be drawn through it before it became a public and burning question. It would be more creditable to the common sense of this city if that clause was drawn simply on the lines of other Municipalities, and then there would be no more heard about it. If it, however, should be presented to Parliament he was sure the architects of the city would take steps to oppose it. It would be their duty to do so, and he could promise that in their opposition they would have the assistance of the Royal Institute of British Architects and of the allied societies throughout the kingdom. The Chairman proposed "Our Guests," coupled with the names of Councillor Sir Otto Jaffe, J.P., and Councillor Wheeler. Councillor Sir Otto Jaffe, in replying, referred to the meeting of the Corporation on the previous Monday, and to the Lord Mayor's statement that the principle of the Bill could be approved of, and that clauses could be altered afterwards. If at the earliest possible moment they formulated clauses they would like to have passed, the Town Clerk would only be too happy to discuss the nature of those clauses. Councillor Wheeler also responded.

BUILDING IN YORK IN 1901.—The erection of new buildings has been very brisk. Most of the houses have been erected on the new estates in Bishopthorpe-road, South Bank, Huntington-road, Leeman-road, Burton-lane, and Acomb-road. Three hundred and fifty-seven plans have been submitted during the year, of which 294 have been approved, comprising 344 houses, seventy-two warehouses, out-buildings, &c., 218 alterations and additions and redrainage to premises, six new streets and back roads, and five public buildings, as follows:—A mission-room in Haughton-street, Burton-lane; a Primitive Methodist chapel in Monkgate; a club-house, Harcourt-street, Leeman-road; one public-house; and the Grand Opera House, Clifford-street

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COMPETITIONS.

BAPTIST CHURCH AND SCHOOLS, BLACKHORSE-ROAD, WALTHAMSTOW.—The competitive designs submitted by Messrs. George Baines and R. Palmer Baines, Clement's Inn, Strand, W.C., for these buildings have been adopted. The accommodation provided in the church is for 812 adults. The estimated cost, including tower, is 4,471*l.*

NEW BATHS AND LIBRARY FOR YORK-ROAD, LEEDS.—The Library and Baths Committees of the Leeds Corporation met recently to consider the plans sent in for the proposed baths and branch library, in York-road. Sixteen sets of plans (all by Leeds architects) were exhibited, and Mr. Leonard Stokes, whose award was confirmed by the Committee, acted as assessor. The recommended awards are as follows :—1st, 50*l.*, Mr. H. Ascough Chapman, A.R.I.B.A., East-parade ; 2nd, 30*l.*, Mr. W. Bakewell, Park-square; 3rd, 15*l*, Mr. Percy Robinson, Albion-street. The plans chosen provide for a building of two stories, costing some 15,000*l.* The library, which is to be built of stone and brick, will have a frontage to York-road, whilst the baths will extend down All Saints'-place at the back. The ground floor of the library is to comprise a lending-library, news-room, and ladies' room ; and on the first floor will be erected a lecture hall, boys' library, and reading-room. The lecture hall, which is intended for public meetings, forms a feature of the building. A clock and ornamental cupola also enter into the design. In addition to Russian bath, there will be the usual slipper and other baths. The swimming-bath will be 75 ft. by 30 ft.

DIARIES AND ALMANACKS FOR 1902.

"WHITAKER'S ALMANACK" for 1902, which has just been published (12, Warwick-lane, Paternoster-row), is the thirty-fourth annual issue of an indispensable work of reference which is deservedly well known for the variety and accuracy of the information it contains, and for the *multum in parvo* character of its contents. The half-crown almanack contains the 472 pages of the shilling work, and, in addition, the following amongst other information, the whole being neatly bound :—British Dominions beyond the seas, foreign countries, meteorological and astronomical summaries, brief articles on local taxation and municipal indebtedness, scientific and engineering summary, patents and inventions, the housing of the poor ; and information as to foreign weights and measures, railways of the United Kingdom and India, and a county and municipal directory of the three Kingdoms. There is, of course, a comprehensive index. This year the Almanack has been improved by being entirely reset from new type, and it is stated that in future it will be printed from specially-prepared plates.

Messrs. Hudson & Kearns (83, Southwark-street, S.E.) have sent us several of their excellent diary blotting-pads, which are well made, and are issued in several sizes. No. 8A and the Bankers' edition (7s. and 8s. respectively) are specially serviceable pads, which contain a calendar, a diary with index, and a tear-off indicator—No. 8A, although not so large as the Bankers' pad, containing, in addition, space for memoranda of appointments. No. 4, a portfolio pad, is a useful form. The same firm send us specimens of their well-known diaries, the merits of which we have frequently referred to. There are no novel features in the diaries this year, and, as they serve their purpose so well, it is not apparent that any addition or alteration would be of advantage, though we think that some of the information contained in them might be revised and extended somewhat. The works are essentially diaries and not books of professional practice with a few leaves introduced for notes. The diary space is ample and well arranged, and the printing leaves nothing to be desired. The Architect's diary is, as usual, issued in two sizes (Nos. 12 and 13, one and two pages to a day respectively), the information (including a list of cases decided in the superior courts of justice during the legal year from November, 1900, to August, 1901, collected by Mr. J. A. Shearwood), being the same in each issue. The Builders' Diary (No. 11) contains all or most of the matter to be found in the Architects' diaries, but, in addition, there are some useful tables for builders. The diary portion is arranged for two days to a page. Diary No. 9 is the Builders' Diary without the tables.

"*Knowledge* Diary and Scientific Handbook" (326, High Holborn, W.C.) has been sent to us. It is the second year of issue of a more than usually interesting work of the kind, which contains much information on scientific subjects, and which is well arranged and printed. Included in the work are articles on "An Equatorial Telescope, and How to Use It," by Mr. A. Fowler, F.R.A.S. ; "The Microscope and Its Uses," by Mr. M. I. Cross ; "Meteorology in Theory and Practice," by Mr. Arthur H. Bell ; and "The Paths of the Planets for the Year" (illustrated with maps specially prepared for the work). The diary should have a successful future. It is published at 3s. net.

"The City Diary" (W. H. & L. Collingridge, Aldersgate-street, E.C.) is now in its thirty-ninth year, and is as well got up as ever. It gives lists of the members of the Corporation, and the other bodies associated with the one square mile of the City, and a mass of information concerning municipal, social, religious, and parochial institutions. The diary proper, which is interleaved with blotting-paper, is entirely free from advertisements. The price is 1s.

The "*Mechanical World* Pocket Diary and Year Book" for 1902 (Emmott & Co., Ltd., New Bridge-street, Manchester) contains useful engineering notes, rules, tables, &c. The work, of which the present is the fifteenth yearly issue, is neatly got up, and the information it contains is kept together and placed in front of the diary proper. The diary is published at the low price of 6d.

"The Royal Navy List, Diary, and Naval Handbook" (Witherby & Co., High Holborn) is an admirably printed and arranged diary. The present issue, the fifth yearly, contains historical and statistical information respecting the Navy, its administration, strength, stations, and cost ; tables of tides and tidal constants ; astronomical notes, &c. ; and much other matter of use to naval men and others who take an interest in the Navy. The price of the handbook, which contains a portrait of Admiral Blake from the painting in Greenwich Hospital, is 3s. The diary portion is arranged for a page to a day.

"The Railway Diary and Officials' Directory" (McCorquodale & Co., Ltd., Cardington-street, Euston-square) contains much information useful to railway officials and others, including the usual information to be found in a diary, and tables for calculating salaries and wages, interest, investments, &c. The Railway Directors and Officials' Directory, Traffic Returns, Account, and Dividends section appears to be exhaustive. Included in it are the names of the various officials connected with the lines, and other information which is often in request. The almanack issued by the same firm is a useful sheet.

The issue of the "Gloucester Diary and Directors' Calendar" for 1902 is the seventh yearly issue of a handy little work. It is published for the Gloucester Railway Carriage and Wagon Co., Ltd., by Mr. Brooke, of Gloucester.

Messrs. Bemrose & Sons, Ltd. (4, Snow Hill, E.C.), have issued their useful little "monthly diary"—a separate diary for each month, suitable for carrying in the waistcoat pocket. The Shakespearean, Proverbial, and other tear-off daily calendars issued by the same firm are very neatly got up.

Messrs. Waterlow Bros. & Layton's Architects', Surveyors' and Auctioneers' Diary and Almanac for 1902 is the twenty-first yearly publication of a well-arranged and useful diary. It contains lists of Fellows and Associates of the Institute of Architects, and members of the Surveyors' Institution, the Institution of Civil Engineers, and other societies ; the London Building Act of 1894 ; a digest of the principal Acts relating to buildings, &c. ; conditions and contract on taking building land ; by-laws of the London County Council ; general conditions for building contracts ; rules for parsonage houses and for planning and fitting-up schools ; professional practice and charges of architects, &c. With all this and much other information the diary portion of the work has been necessarily curtailed, but taken altogether the diary is an excellent one.

BOOKS RECEIVED.

BUILDERS' ACCOUNTS.—By John A. Walbank, A.C.A. (Gee & Co.)

A GLIMPSE OF CRANBROOK (Homeland Association Handbooks). By W. Stanley Martin. Second Edition. (The Homeland Association.)

Correspondence.

To the Editor of THE BUILDER.

THE DIRECT EMPLOYMENT OF LABOUR.

SIR,—Again referring to Mr. Blashill's letter appearing in your issue of the 7th ult. :—In mine of the 14th I enumerate four "distinct statements" contained in his letter and ask for enlightenment. Upon reading his further letter in your issue of December 21, I see he states I have not caught his argument. I admit the soft impeachment, and even now cannot quite fathom the mystery.

Certain portions of the letters would seem to point that Mr. Blashill does not advocate the principle of "direct employment," and yet again other points and "definite statements" made would appear to dispel this view ; in any case, certain of his statements and explanations are calculated to embarrass and mislead (unintentionally, I know) many, and certainly the uninitiated.

If your readers will refer to paragraph 1, and my comment thereon (see issue of December 14) on the subject of "Yard, machinery, &c.," and then again to Mr. Blashill's last letter, they will, no doubt, observe that no enlightenment is thrown upon this matter, excepting that inadvertently Mr. Blashill refutes his former statement, *i.e.*, he says "One of my friends had such troubles as Mr. Chappell prognosticates. They might have ruined a contractor, for every job he had got would have been struck," &c.

By "such troubles" I assume he refers to those consequent upon an endeavour to get the workmen to "fix only" what I refer to as "imported goods" (*vide* my comment on paragraph 1). Now, I would point out that contractors know perfectly well that friction is likely to arise on this question, and to avoid the chance of it they cannot, as a whole, do better than manufacture or work the article themselves ; hence the "necessity of the contractor having his yard, workshop, machinery, &c." Really, it seems that Mr. Blashill's admission confounds his former statement entirely.

Again, to understand the explanation of paragraph 3—*i.e.*, "The owner with money in hand," &c.—it is first of all necessary to arrive at a fair and reasonable meaning of Mr. Blashill's words, "even the *shortest* credit." I take it that a fair construction to put upon them would be: to "pay as soon after delivery of materials (and assuming they are as per order and satisfactory) as possible." Plenty of contractors do this, and I venture to think a "Private Owner" would do no more. If, however, he did (that is to say pay before such delivery and approval) he would be dubbed "a very poor man of business," and would find few to sympathise with him were he to find himself the victim of "misplaced confidence." "Show them gold," says Mr. Blashill; yes, and one can imagine the anxiety of merchants (of a certain class) to do business on these terms. It does not follow, however, that the "Private Owner" would find he had bought on better or even equal terms with the contractor. Fancy the joinery for a building being bought under such conditions! It almost makes one's hair turn grey to think of the consequences. I instance this, as Mr. Blashill appears to assume that "ready money" is better than "even the *shortest* credit," and I maintain that, although perhaps on the face of it such may appear the case, one has to consider results.

Here is another statement in Mr. Blashill's last letter with which I cannot agree, *i.e.* :—"The owner whose money is ready must save the interest which the contractor has to pay while he is waiting for the owner's cheque." In the first place the assumption is scarcely creditable to contractors in general. Does it not rather imply that they are as a class impecunious? I am afraid, too, were the contractor always to have to rely upon the timely receipt of the owner's cheque (a necessary preliminary to which is receipt of the architect's certificate), or, in the event of his not getting it, a loan, not only the merchants might fare badly, but the contractor also! Business generally could not be carried on under such conditions.

The "bright and honest" manager referred to is readily to be found no doubt, but not so the "bright, honest, and *capable*" manager. By this I mean one who is fitted to assume complete control and direction of large works and the numerous intricate details connected therewith. He, I think, is a *rara avis*. How many builders know to their cost the difficulty of obtaining such an one? We know, of course, there are such, but how many "private owners" could afford to pay the salary, &c., they can command? And furthermore, if a builder has such difficulty in obtaining the services of such a man, with all his knowledge of the intricacies of the building business, how much more difficult for a private owner, even though assisted by his architect? Again, a man of this character is very unlikely to take on a job of such a "casual nature." As a matter of fact, I do despond for the private owner who contemplates going in for "direct employment." One has to consider these things as a whole, not singly, and I think most will agree that "as a whole" the system would be, and so far as statistics already show is, a failure. Mr. Blas-

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hill says (referring to the private owner): "His class already pays, in the shape of enhanced tenders, for all [note the 'all'] the disputes between contractors and workmen." This I dispute, and contend that many of the disputes belong to the class which he styles "uninsurable risks," which risks the contractor takes without (owing to excessive competition and, ofttimes, unfair and stringent conditions of contract) being able to put a price on the item.

'Tis true, perhaps, the contractor has to sit down helpless during strikes; assume, however, a strike is on, and that a "private owner" is able to get men for his one job — does any one imagine he would save money by this? No, I think not; the probabilities are the few men engaged, influenced by the plight of the thousands of their fellow workmen "out for airing," would not be in any great haste to finish their job, and "the cost would go on piling up." In conclusion, the heading under which this correspondence appears in your paper is "The Direct Employment of Labour," yet Mr. Blashill concludes his last letter with the astounding assertion, "In dealing with the question of direct employment, I would keep clear of labour questions." Surely in dealing with this subject one cannot reasonably disassociate the labour problem from it? GEORGE H. CHAPPELL.

FIREPROOFING MATERIALS.

THE following letter has been sent to us by the Boston Manufacturers Mutual Fire Insurance Co.; it is not, as we understand, addressed to this journal, but is a lithographed letter which has probably been sent round to a good many firms in England. We give it publication however, as it may thus come before some persons who could give useful information on the subject in hand, and who may not otherwise see it:—

"Boston Manufacturers Mutual Fire Insurance Co.,
31, Milk-street, Boston,
December 7, 1901.

DEAR SIRS,—A few months since, before my recent visit to England, I made an effort to secure materials and contributions for a thorough test of so-called fireproofing materials, floors, and the like, mainly devised for the protection of steel from heat. This effort was not sustained to any considerable extent by the promoters of various types of construction, nor by the makers of concretes. I therefore dropped the subject for the time.

On my recent visit to London, in consultation with the architects and engineers who constitute the British Fire Prevention Association, I was confirmed in my distrust of some of the materials which have been commended for the protection of iron and steel used in construction. The attention of that Association is mainly given to what is called 'fireproof construction,' not only in city buildings, but in factories and workshops as well.

Our attention has been mainly given to the slow burning construction of brick and timber, and we have not yet been called upon to deal in any large way with steel construction. In anticipation of such demand upon us it is necessary for us to know the present state of the art.

In Great Britain it is said to have been proved that many of the concretes, some of which are there called 'breeze,' of which coal ashes are the principal component material, are very destructive to iron and steel. These ashes come from coals containing a good deal of material which may cause corrosion, and the long-continued contact even of dry ashes with iron and steel beams, wire or thin plates, imbedded in them, is said to oxidize them. This may come, however, from the avidity with which ashes absorb humidity from the atmosphere, and may be attributed to that rather than to any other fault in the ashes.

Any concrete or any material containing plaster of Paris (sulphate of lime) is known to be somewhat dangerous, if not destructive, and there may be other causes of corrosion as yet unknown to us. We know of some cases in which corrosion has set in very rapidly on gas-pipes and on cribs of rails intended for foundations, owing to corrosive qualities in the concrete in which they were imbedded. We are aware that many investigations and reports have been made by the representatives of special methods, but we are not informed of any general report or conduct of tests corresponding to those now being made by the architects and engineers who have organised the Fire Prevention Association of Great Britain. We, therefore, address the following questions to you:—

1. What attention have you yet given to causes of corrosion other than ordinary humidity which may get through minute cracks in any kind of veneer or covering for steel members? In other words, what causes of corrosion have been developed in your practice other than those arising from dampness?

2. What precautions have been taken to meet this hazard?

3. What general or special information has been printed upon this subject? Who are the authorities and what printed material can be found and where?

4. What studies are you yourselves making in this matter?

5. What knowledge have you of active corrosion from dry materials coming in contact with the iron or steel frames, posts, or other members of any building, or iron used in foundations?

6. To what extent do you depend, if at all, upon angle irons, wire or sheet metal imbedded in concretes for floors or arches, for the stability of the floor after the cement or concrete has become permanently set?

I have asked these questions with the intention of making arrangements for an exhaustive study of this subject and for such tests as may be possible of each and all the various coverings now upon the market for protecting iron and steel—the concretes, the fireproof floors, and all other matters in which corrosion from any cause may be a source of danger. EDWARD ATKINSON, President."

LIVERPOOL CATHEDRAL.

SIR,—As you invite correspondence on the subject of your article on the Liverpool Cathedral Petition, I hope you will find room for the few remarks I have to make.

I have lately visited the two sites in question, and I confess I am unable to see the justice of the very strong objections you see to St. James's Mount. Both sites are good, and both have certain drawbacks, the objections to the monument site being its extreme noisiness and there being no room on it for buildings other than the cathedral itself, a point, I imagine, of some importance. The site is surrounded by electric tram-lines, with the unceasing jangling of the car bells. The petitioners seem to look on this as an advantage, but it is hardly one which will be appreciated by those who have to make actual use of the cathedral.

St. James's Mount is not on any very important thoroughfare, and it is somewhat narrow. It has also the great defect of running north and south instead of east and west. But the site in itself is a particularly fine one, and one which any architect would take delight in dealing with. It is very peculiar, as the plateau stands some 15 ft. above the flanking road. This would give a splendid effect to the principal façade, which would have a fine open space about 500 ft. in depth leading up to it. There would be ample room at the further end of the Mount for any further buildings which might be required.

This site, like the other, is very high, and the cathedral would be well seen from the river and other more distant points.

The site is very open as your plan shows, the cemetery running the whole length of it to the east, while there is ample space to the north and south. It is said not to be central, but looking at a map of the whole city it seems just as central as the monument site. The fact seems to be that by the word "central" the petitioners mean "close to St. George's Hall and the Lime-street Station." Their idea evidently is that all the great public buildings should be grouped together as closely as possible; but though this may be quite right in the case of a smaller town, it seems to me that Liverpool is amply large enough to have more than one centre of architectural interest.

The surroundings of St. James's Mount, at least to the west, are, it is true, of a mean order; but the cathedral would certainly by degrees form its own neighbourhood. Beyond the cemetery all the buildings are good.

The petitioners object to a public garden and recreation-ground being absorbed; but I am told that St. James's Mount is very little used. I spent about an hour on and about the site, and saw one young woman, one lad, two boys, and a policeman. The day, however, was cold, and the average attendance is probably greater.

Your statement that St. James's Mount in Liverpool may be compared to Bayswater in London is misleading. The site is not more than fifteen minutes' walk from St. George's Hall; and, after all, people's legs are the same length in Liverpool as they are in London.

The narrowness of the St. James's Mount site could be remedied easily by encroaching some 40 ft. on the upper terraces of the cemetery. Unhappily, there is no cure for the want of orientation, and this really is the only serious defect I can see in the site. J. OLDRID SCOTT.

2, Dean's-yard, London.

*** We particularly said that in comparing the St. James's Mount site to a site in Bayswater, we referred to the nature of the site, not to distance. In regard to Mr. Scott's closing remark, we can only conclude that he considers axial line and vista as matters of no consequence in respect of a great building. It is a curious illustration of the national English indifference to this point, that even an eminent architect should fail to recognise its importance. No French architect, we feel assured, would pass over want of central vista as being "no serious defect" in a site for an important building. —ED.

THE ELEANOR CROSS, HARDINGSTONE.

SIR,—The Eleanor Cross at Hardingstone, near Northampton, has been undergoing inspection by the Northamptonshire County Council, on the occasion of its passing into their possession.

The scaffold which has been erected will remain in position for a week or two longer, and an excellent opportunity is thus afforded for measuring the whole structure, provided the weather is not too severe.

The County Council would be glad to possess a good set of drawings, and if any student cares to take this opportunity of measuring a subject which has not yet been properly undertaken, I shall be glad if he will communicate with me as soon as possible.—Yours faithfully,

J. ALFRED GOTCH.

West Hill, Kettering.

BAPTIST CHURCH-HOUSE TENDERS.

SIR,—Considerable dissatisfaction appears to have been caused by the tendering for this building. I am informed that the bills of quantities were delivered to the builders one or two at a time during a period of about six weeks. Eventually, November 19 was fixed for opening the tenders, but these tenders were not to include the plumbers' and painters' and glaziers' bills.

The amounts of the tenders received were announced, and the two lowest were —

"A" £32,818
"B" 32,700

The tenders for the plumbers', painters', and glaziers' bills were opened on November 22, and the two lowest amounts were:—

"B" £2,800
"A" 2,484

making the total figures thus:—

"B" £35,500
"A" 35,302

It seems unfortunate that the amounts of the first part of the tenders were made known to the competitors, as, curiously enough, the difference in the second tender just reverses the positions of the two lowest competitors.

WILLIAM F. KING,
President of the London Master Builders' Association.

"SUGAR IN MORTAR."

SIR,—Will any one of your correspondents inform me if, in using sugar with mortar, it is necessary to make up oftener, or does it do if made up in the ordinary way? E. YETMAN, SEN.

The Student's Column.

DRAINAGE AND PRIVATE SEWAGE-DISPOSAL.

INTRODUCTION.

IN this series of articles an attempt will be made to set forth the details of modern practice relating to drainage and private sewage disposal. A short statement of the law relating to these subjects will also be given. Sewers and public sewage-disposal works will not be considered except so far as may be necessary for purposes of comparison and illustration. The work naturally falls into three divisions—namely, Part I.—The law relating to drainage, &c.; Part II.—Drainage; and Part III.—Private Sewage-disposal. On the subject of drainage it is scarcely possible to add much to what has already appeared in recent publications, but a description of the various methods now in operation for the purification of sewage on a small scale will, it is hoped, possess greater novelty, and may prove of service to architects who are called upon to erect houses, schools, and other buildings in districts which are not served by sewers. The ideal method of sewage-disposal has not yet perhaps been discovered, but there can be little doubt that ultimate success will be attained by working on Nature's lines—that is to say, by making full use of the bacteria which have been so aptly termed "Nature's scavengers."

PART I.

THE LAW RELATING TO DRAINAGE, &C.

CHAPTER I.

England and Wales, except London.

1. *Drains and Sewers.*—The dictionary definition of a drain as "a channel through which water or other liquid flows off" is not one which can be accepted by the architect as strictly correct. A channel conveying sewage may be technically either a drain or a sewer, and lawyers have been greatly exercised in trying to define what constitutes the difference between the two. It cannot be said that they

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have succeeded to any one's satisfaction but their own. Indeed, the enactments and legal decisions on this subject seem only to have made confusion worse confounded.

The definitions given in Section 4 of the Public Health Act, 1875,* are as follow :—

"DRAIN means any drain of and used for the drainage of one building only, or premises within the same curtilage, and made merely for the purpose of communicating therefrom with a cesspool or other like receptacle for drainage, or with a sewer into which the drainage of two or more buildings or premises occupied by different persons is conveyed.

SEWER includes sewers and drains of every description, except drains to which the word 'drains' interpreted as aforesaid applies, and except drains vested in or under the control of any Authority having the management of roads and not being a Local Authority under this Act."

These definitions—which apply to England and Wales, exclusive of London and of those districts where Part III. of the Public Health Acts Amendment Act, 1890, has been adopted—appear at first sight to be fairly clear and free from ambiguity, but on closer inspection they are found to be as indefinite as the most combative lawyer could desire. What is meant by "building" and by "premises within the same curtilage"? Dual or multiple occupation of a building is not always sufficient to convert it into two or more buildings within the meaning of the Act. Thus, a block of tenements may be only one "building," and the same may be said of a row of almshouses or a group of college buildings. Similarly, a pair of semi-detached houses with an approach in front common to the two houses, and a common yard in the rear, must be regarded as "premises within the same curtilage," and the common sewage-conduit from them will therefore be a drain and not a sewer. It has also been held in a rating case (Smith *v.* Seghill) that the entrance-lodge of a house is in the occupation of the master, if the entrance-gates are attached to the lodge and the occupant of the lodge is required to open the gates.

Lumley holds that a pipe conveying sewage from a house to the sea or to a river is not a drain within the meaning of the definition. What, then, is it? The popular view is that it is a drain, and this would probably be the judicial view if the point were raised in Court. There are many natural water-courses throughout the country, which, on account of their long-continued and serious pollution with sewage, have come to be accounted sewers, and the sewage-conduits leading to them from single buildings or from premises within the same curtilage are therefore drains.

The importance of being able to give a correct answer to the question—"When is a drain not a *drain*, but a *sewer*?"—will be better appreciated when it is remembered that, by Section 13 of the Act, all sewers (with certain exceptions to be hereafter stated) are vested in the local authority, and that, by Section 15, local authorities are compelled to "keep in repair all sewers belonging to them." Further, by Section 19, "every local authority shall cause the sewers belonging to them to be constructed, covered, ventilated, and kept so as not to be a nuisance or injurious to health, and to be properly cleansed and emptied." In the case of Touzeau *v.* Slough Urban District Council (1897—60 J.P., 103), the plaintiff claimed damages in consequence of outflows of sewage from a defective sewer belonging to the defendants; these outflows had compelled him to leave his house fifteen months before the expiry of his lease. It was held that he was entitled to recover from the defendants as damages (1) the expense of moving; (2) rent for the five quarters for which he was liable to his landlord; (3) an amount in respect of physical discomfort caused to him during the whole of his tenancy; and (4) the actual expense caused in connexion with illness in his family arising from the outflow of sewage.

It is commonly said that a conduit conveying sewage from one building only is a drain, and that a conduit from two or more buildings is a sewer, and this is perhaps as true a generalisation, from the definitions of the Public Health Act, 1875, as can be given in few words; but before entering upon litigation with the Local Authority, the owner of property which is let in two or more occupations and served by a common drain ought to satisfy himself that there are two or more "buildings," and not merely a group of "premises within the same curtilage." It must also be remembered that a general statement of this kind has not the authority of an Act of Parliament.

Some years ago, after the writer had carried out the sewerage of a village, the Local (Rural) Authority served notices on the owners of the houses, and compelled them to make connexions with the new sewers. Three persons owning a number of houses in a court branched their drains into a main conduit which they laid along the court to the sewer. Nothing was said about the matter until the conduit became choked. This was a nuisance, and the sanitary inspector served notices on the owners ordering them to abate it. On the writer's advice they refused, declaring the conduit to be a sewer. The Local Authority, after a little hesitation, undertook the work, and the conduit is now a sewer, and therefore always will be. For it is a legal maxim that a conduit which is once a sewer is always a sewer, so long as it remains in use.

This experience cannot, however, be regarded as a precedent likely to be followed in every case. The circumstances were particularly strong against the Local Authority, and laymen are apt to forget that the slightest difference in the facts concerning two conduits may make all the difference in the decision as to whether they are drains or sewers. Thus a yard or even an ashpit used in common by the tenants of two or more houses, even though the buildings are detached, may cause a Judge to regard the property as "premises within the same curtiiage," and the common conduit from them as a drain. A public right of way between two buildings is, on the other hand, a severing factor; and, of course, a party wall, without any means of communication between the gardens, buildings, and yards on the two sides of it, has the same effect. Then, again, a cesspool receiving the discharges from the drains of two or more "buildings" is not a sewer, but if an effluent pipe is laid from it this pipe will as a rule be a sewer, although not invariably so. In the case of Swanston *v.* Twickenham Local Board the Court of Appeal decided that a manhole connected with a sewer was part of the sewer, and, therefore, vested in the Local Authority.

The whole subject bristles with difficulties, and is one for the lawyer rather than the architect, but the latter ought to have some knowledge of the subject, so that he will not undertake the repair, on behalf of a client, of a conduit which is really a sewer vested in the Local Authority. On the other hand, it is sometimes desirable, in order to reserve the right of altering the course of a conduit and to prevent the Local Authority's workmen entering upon private property, to claim that the conduit is a drain and not a sewer. In such a case the owner will be careful to cleanse and repair the conduit so that it does not become a nuisance.

By Section 15 every Local Authority is compelled not only to "keep in repair all sewers belonging to them," but also to "cause to be made such sewers as may be necessary for effectually draining their district or for the purposes of this Act." The latter part of this section should be read in connexion with Section 150, which declares that the Local Authority in an urban district may require the adjoining owners or occupiers to sewer any street within the district "not being a highway repairable by the inhabitants at large." It is a more difficult matter to define "street" than "drain" or "sewer," and we will not attempt to do so; suffice it to say that it has been taken to include in this connexion private courts and alleys as well as new streets or thoroughfares. Needless to say, the Local Authority usually takes advantage of this clause and compels the person who lays out a new street to construct a proper sewer before any buildings are erected.

2. *Combined Drains.* — Undoubtedly the definitions of "drain" and "sewer" given in the Public Health Act, 1875, are far from satisfactory. Under this Act a conduit receiving the sewage from two or more distinct buildings, must, as a rule, be regarded as a sewer, whether it is laid through private property or in a public road, and the onus of repairing it rests on the Local Authority, even though the Authority (as would be the case in many rural districts where by-laws had not been adopted) had not given consent for it to be laid, or inspected it during construction. Obviously Local Authorities regard it as a hardship that they should be compelled to keep in repair conduits which are to all intents and purposes private drains, and a new kind of drain, known as a "combined drain," was therefore defined in the Public Health Acts Amendment Act, 1890. The new definition, however, applies only to those districts where Part III. of this Act has been adopted, and only for the purposes stated in Section 19, which reads as follows :—

"1. Where two or more houses belonging to different owners are connected with a public sewer by a single private drain, an application may be made under Section 41 of the Public Health Act, 1875 (relating to complaints as to nuisances from drains), and the Council may recover any expense incurred by them in executing any works under the powers conferred on them by that section from the owners of the houses in such shares and proportions as shall be settled by their surveyor, or (in case of dispute) by a court of summary jurisdiction. 2. Such expenses may be recovered summarily, or may be declared by the Urban Authority to be private improvement expenses under the Public Health Acts, and may be recovered accordingly. 3. For the purposes of this section the expression 'drain' includes a drain used for the drainage of more than one building."

The new definition of the word "drain" embodied in this section does not, according to Glen (1895), "appear to affect the definition of 'drain' and 'sewer' in the present Act (*i.e.*, the P.H.A., 1875), or the vesting of such 'single private drains' in the Local Authority, though the section gives the Local Authority express power to recover certain expenses incurred by them in connexion with such drains from the owners of the houses." In the case of Hill *v.* Hair it was held that a certain conduit draining several houses which had been erected prior to the passing of the Public Health Act, 1848, was a sewer, notwithstanding the fact that the Corporation (Carlisle) had adopted Part III. of the Public Health Acts Amendment Act, 1890. The grounds of the decision appear to have been that the conduit was a sewer prior to 1890, and that the 1890 Act was not retrospective, and did not therefore convert it into a drain.

Mr. Justice Cave, however, in delivering judgment in the case of Seal *v.* Merthyr Tydfil Urban District Council (1897), took exception to the foregoing decision. Mr. Justice Cave's judgment is marked by common sense, although it appears to go further than the words of the 1890 Act warrant. After asking what is a "private drain" within the meaning of Section 19 of the Public Health Acts Amendment Act, 1890, he continued :—"It appears to me to apply to a drain constructed on private premises to which the public have not access. 'Private' is to be taken in that sense; that is, as being a drain which is private, and constructed on private land—on land which is not open to the public. I think, so far as Hill *v.* Hair is concerned, the law was wrongly applied there, the substantial distinction being that of a private drain kept up by a person for his own profit." He therefore held that the conduit (in Seal *v.* Merthyr Tydfil U.D.C.) was a drain; this conduit was laid through the gardens along the back of a row of houses, and could not be used for draining other premises.

The case of Lancaster *v.* Barnes District Council (1898) is interesting in this connexion. Four houses, belonging to two different owners, were served by a single private drain, which gave rise to a nuisance. The Council had adopted Part III. of the Public Health Acts Amendment Act, 1890, and under section 19 of this Act and Section 41 of the Act of 1875, called upon the two owners to relay the whole of the drain and do other prescribed works. It was held that the fact that neither owner could relay the part of the drain situate in the other's premises without committing a trespass was no objection to the validity of the notice, and that on non-compliance with the notice the local authority might execute the works, and recover the expenses from the owners under Section 19 of the Act of 1890.

It may be taken for granted that in any dispute as to whether a conduit is a private drain or a public sewer, the local authority gets the benefit of the doubt. The moral is obvious.

NEW POST OFFICE SITES.—A Bill will be introduced in the ensuing session of Parliament for empowering the Postmaster-General to acquire sites for the postal service at Alleyn Park, Dulwich, and in St. Marylebone at the junction of Barrett and Bird-streets, near Manchester-square.

* Section 2 provides that "this Act shall not extend to Scotland or Ireland, nor (save as by this Act is expressly provided) to the metropolis."

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OBITUARY.

MR. ONSLOW FORD.—We greatly regret to announce the death, from pneumonia after a very short illness, on Monday, December 23, at his residence, No. 62, Acacia-road, St. John's Wood, of Mr. Edward Onslow Ford, R.A., aged forty-nine years. Mr. Onslow Ford was born on July 27, 1852. When eighteen years old he left Blackheath Proprietary School to study painting, and having entered the Royal Academy at Antwerp, he passed into the Antique School, then under the direction of M. Buffeau. He subsequently became a student, 1871-2, in the Academy at Munich, where, it appears, Professor Wagmüller guided his talents to their true course — that of modelling and sculpture. Returning to London, he became a constant exhibitor at the Royal Academy, his first accepted work being a portrait-bust of his wife, a daughter of the Baron Franz von Kreusser, whom he married at Munich in 1873. In 1885 he sent to the Royal Academy Exhibition two works that attracted considerable notice — "In Memoriam," a bas-relief of a recumbent figure guarded by cherubim (illustrated in our columns of July 4, 1885), and a seated portrait-figure of Sir Henry Irving as Hamlet, which is now in the Guildhall Art Gallery, London. In the following year he exhibited there some figures, after drawings by Mr. Westlake, for the restoration of the great screen in Winchester Cathedral, designed by the late J. D. Sedding; and in the same year he carved the busts for the façade of Prince's Hotel, Piccadilly (Mr. E. R. Robson, architect). Meanwhile he had been successful in a competition for a statue in bronze of Sir Rowland Hill, erected by the Corporation in 1882 on the eastern side of the Royal Exchange, and had produced a statue of Gladstone for the City Liberal Club. On May 7, 1887, and June 21, 1890, respectively, we illustrated Mr. Ford's "Peace," a female figure, bronzed, which he exhibited at the Salon in 1888 and the French Exhibition in the following year, and his "Music" and "Dancing," two female figures sculptured in bronze, for the Maharajah of Durbungah, Bengal. In 1888 he sent to the Glasgow Exhibition "A Dirge," a nude figure carrying a torch. Amongst his other imaginative works we should mention the two bronze statuettes—"Folly," bought for 200 gs. out of the Chantrey Bequest (a replica was in the New Gallery, 1899), and "The Singer" (1889*)—which are now in the National Gallery of British Art, Millbank; "Applause" (1893*), a female figure on a pedestal, illustrated in the *Builder*, June 10, 1893; and "Justice" and "Knowledge" (1898*), for the monument of the late Maharajah of Mysore; "Glory to the Dead," a small nude figure in bronze (1901*). His "St. George," a small figure, and "Snowdrift" are still, we believe, in his studio; that of "Echo" was in the Glasgow Exhibition of last year. Of his many works in portraiture, Mr. Onslow Ford will, perhaps, be best remembered for those he produced of Queen Victoria. Chief among them is the imposing and colossal statue of the Queen enthroned, to commemorate her Diamond Jubilee, for a site in front of the Municipal Buildings, Manchester (1901*). The others include a marble bust that he made for the Queen herself (1899*); a bust for the Royal Isle of Wight Infirmary, in the new wing opened on July 28, 1899; a bronze statue for Piccadilly, Manchester; a marble bust, for the Lord Mayor of Sheffield, 1900, who presented it to the Town Hall opened by Queen Victoria in 1897; a marble bust presented by Mr. George P. Ernest to the Lord Mayor and Corporation, which was unveiled in the Saloon, Mansion House, on November 6, 1900; the statue which he himself presented in October last to the Alexandra Palace, Muswell Hill; and a white marble bust given by Queen Victoria to Lord and Lady Cadogan during her visit to Dublin Castle in 1900. Mr. Onslow Ford executed the Shelley Memorial (1892*), a white marble figure of the poet lying upon a bronze pedestal, the gift of Lady Shelley to University College, Oxford, and placed in a sunken chamber designed by Mr. Basil Champneys; the Marlowe Memorial, Canterbury; the Gordon Memorial, Royal Engineer Barracks, Chatham, representing General Gordon riding upon a camel; the Gordon Memorial shield presented to Gordon's sister by the officers of the corps of Royal Engineers; the equestrian statue—cast with gun-metal given by the Government of India — of Field-Marshal Lord Strathnairn at Knightsbridge, 1895; and an equestrian statue of the late Maharajah of Mysore (exhibited in 1900 in the quadrangle before Burlington House*). The list extends to the Dr. Jowett monument, Balliol College Chapel, Oxford, a decorative composition (1897*), illustrated in the *Builder* of May 22, 1897; a seated figure of the late Rev. Dr. R. W. Dale for Birmingham (1898*), and a monumental bust of Dr. Dale for Mansfield College Library, Oxford, 1895; statues of Sir James Gordon, Mysore, and Sir William Pearse, Glasgow; busts of Sir John Pender for the Library, University College, London, the Rev. John Rodgers, Sir Charles Reid, the late Archbishop of York, Lieutenant-General Sir Andrew Clarke, and of his brother artists, Professor Herkomer, Mr. A. Hacker, Mr. Briton Riviere, Mr. Orchardson, and Sir John Millais; busts of the late Sir Charles Hallé (a gift of Sir William Houldsworth to Manchester), 1897; Jacob Bright, M.P., in the Town Hall, Manchester, 1898; Sir David Gamble, C.B., for the St. Helen's Technical Institute, Lancashire (the buildings were given to the townsfolk by Sir David Gamble); Alderman Whitehead (the then Lord Mayor), given to the Corporation of London by the Commercial Travellers of England, and exhibited at the Salon in 1888; W. E. Gladstone for the Union Society, Oxford University, unveiled on February 14, 1900; Sir William Agnew and Prince Leopold of Battenberg (1899*); a figure of Sir Henry Irving as Mathias in "The Bells"; a statue cast in bronze by Messrs. Rovini & Paulanti, of London, of the late Ralph Ward-Jackson, first M.P. for West Hartlepool (in Church-street, West Hartlepool); the marble statue of the late Professor Huxley, Natural History Museum, unveiled by the present King on April 28, 1890; a seated statue, in white marble, of the Duke of Norfolk, Sheffield Town Hall, set up twelve months ago; portrait busts of the Duke of Norfolk, Mr. Lewis Waller as Brutus (in bronze), Mr. Wolfram Onslow Ford, the Lord Mayor of Sheffield, and (in bronze) Mr. G. Agnew (1900*); and a medallion bas-relief, with portrait, of Lady Elliott Drake (1901*). Mr. Onslow Ford superintended the casting of the statue of Lord Lansdowne in Calcutta, 1900, for which the late Harry Bates, A.R.A., completed the model before his death, and the execution of the memorial bronze statue of Dr. Haig Brown, Master of the Charterhouse, which after Harry Bates's death was completed by his (Bates's) pupil, Mr. Henry Poole, 1900, and in that same year the execution, by Mr. F. Boucher, of the carving of the shaft, with a band of cherubim, of the font, Holy Trinity Church, Sloane-street. In June, 1899, the Gladstone Memorial Fund Committee, of Glasgow, deputed Mr. Onslow Ford, together with—we understand—Mr. Alfred Gilbert, Mr. Thornycroft, and Mr. Frampton, to prepare models of a statue for George-square in that city. In the course of the last eighteen months Mr. Ford was commissioned for the following works: a bust for the Imperial memorial to Sir George Grey in the crypt of St. Paul's; the Ruskin memorial in Westminster Abbey; a statue of the late Professor Sedgwick for the new Geological Museum, Cambridge University; a statue of the late Prince Christian Victor, who died in the course of the present South African war, to be erected at the foot of the Hundred Steps, Windsor Castle, in a canopied niche designed by Mr. A. J. Nutt, architect and clerk of the works at the Castle; and a silver statuette, for presentation to Lord Roberts, Commander-in-Chief, as a memorial of his son, Lieutenant Hon. F. Roberts, V.C., who fell in that campaign. Mr. Onslow Ford, who leaves a widow and family, was elected an Associate, R.A., in 1888, and a Royal Academician in 1895. He was recently appointed a corresponding member of the Institute of France, and had received first and second medals at Paris, Berlin (1896), Munich, &c. He was a member of the Council, Royal College of Art, for sculpture and modelling, and an examiner on modelling in the national competition of Schools of Art (1901). In February, 1900, the Duke of Devonshire, Lord President of the Board of Education, appointed him, with Mr. T. G. Jackson, R.A., Sir William Richmond, R.A., and Mr. Walter Crane, to advise the Science and Art Department upon art matters relating to art schools and classes, the Art Museum, and the Royal College of Arts; and he made the report upon sculpture for the Royal Commission of the Paris Exhibition, 1900.

* Royal Academy Exhibition.

GENERAL BUILDING NEWS.

CONGREGATIONAL CHURCH, BURY PARK, LUTON, BEDS.—The designs of Messrs. George Baines and R. Palmer Baines have been accepted for this new church. The estimated cost is 3,500*l.*, inclusive of a tower. The seating accommodation is 533 adults. The facings are of red brick and dressings of Bath stone.

PRIMITIVE METHODIST CHAPEL, LEEDS.—The Lord Mayor of Leeds (Mr. A. E. Butler) recently laid the foundation-stone of a new Primitive Methodist chapel at Woodhouse Hill. In connexion with the same enterprise, eighteen additional memorial-stones were laid on the 27th ult. The architects are Messrs. T. & C. B. Howdill, Leeds.

SCHOOLS, NORTHFLEET.—New schools have been built according to the directions of the Northfleet School Board, Northfleet. The schools are situated on a site at the corner of Old Dover-road and Springfield-road, and accommodate 520 boys and girls and 254 infants. The boys' and girls' school contains eight classrooms. Four of these rooms have sliding partitions between, and can be thrown open to give one large room 56 ft. 6 in. by 46 ft. 8 in. This would accommodate about 530 people for a public meeting, &c. The infants' school contains four classrooms. Two of these rooms are separated by a revolving shutter, so that two of the classrooms can be formed into one room 58 ft. 8 in. by 24 ft. A teachers' room has been provided on the first floor over the girls' and infants' entrance. There are two cloakrooms to each department and two entrances to each. The heating chamber, caretaker's cupboard and coke store, are under part of the infants' school. Under the other portion of the infants' schoolroom is placed the covered playground for the girls and infants. The schools, the foundation of which rests upon the hard chalk beds, are built of bricks. Inside are used hard wire-cut bricks, faced with red bricks, with gauged arches and Monks park-stone dressings. The roof is covered with Perfecta plain tiles. The whole schools are heated by hot-water radiators and pipes, which were supplied and fixed by Messrs. C. P. Kinnell, of Southwark-street. The ventilation appliances were supplied by Messrs. Kite, of Euston-road. The whole of the schools are lighted with gas with incandescent burners. The latrines are placed on the inside boundary wall. The whole of the drainage runs into septic tanks, and after passing through the tanks the clear effluent runs into a cesspool. The sanitary fittings were supplied by Messrs. Adams, of Westminster. The flooring of the classrooms and corridors is of pitch-pine wood-block, laid with mastic by Messrs. Lowe. The cloakrooms are of Stuart's granolithic paving. The front entrance is of terrazzo, laid by Mr. Bennett, of Broad-street. The boundary walls next the roads are low with blue Staffordshire coping, and on the top is placed a wrought-iron fence made and fixed by Messrs. Fowle, of Gravesend. The boundary walls at the back are 7 ft. high, and are of stock bricks. Between the playgrounds is placed an unclimbable fence. A caretaker's house has been built to correspond with the school buildings, providing parlour, kitchen, scullery, with usual offices, and three bedrooms. The amount of the contract for the schools and caretakers' house was 9,575*l.* The architect was Mr. S. J. Adams, of South end, and the builders were Messrs. Multon & Wallis, Gravesend, and Mr. Nightingale was their foreman.

BUILDINGS IN AYR.—A number of buildings of a public or semi-public character are at present in course of erection, or have just been completed, in the burgh of Ayr. Chief among these is the new Town Hall, which is being reconstructed on the old site from designs by Mr. J. K. Hunter, architect, Ayr, at a cost of about 10,000*l.* A new theatre, with all modern improvements, is being erected on the site of a previous wooden structure in Carrick-street, by Mr. J. M'Hardy Young, architect, Ayr, at a cost of over 7,000*l.* The structure is of red brick, and it has been set back with a view to the eventual widening of the whole street. A new drill hall and headquarters for the 2nd Volunteer Battaliion Royal Scots Fusiliers, has been commenced at the south end of Alloway-street, from designs by Mr. James A. Morris, architect, Ayr. The drill hall, when completed, will be 96 ft. by 50 ft., and will be the largest hall in Ayr. The structure includes an armoury for 300 rifles, a gymnasium, a reading-room, a billiard-room, an officers' mess-room, a sergeants' messroom, a ladies' and gentlemen's cloakroom, artistes' room, and platform. A block of buildings is being erected in High-street for the British Linen Banking Company, whose present premises are in Newmarket-street. The building occupies a site nearly opposite the Union Bank of Scotland. An addition to the Ayr Corporation electric light and electric tramways station in Mill-street is nearing completion. This includes a suite of offices and committee-rooms, while the accommodation for engines and boilers has been doubled. A new church is being built in Midton-road, to be known as Trinity United Free Church. The Glasgow and South-Western Railway Co. have in hand in the vicinity of Newton-on-Ayr Station the installation of a complete set of plant for the manufacture of oil gas for the lighting of their railway carriages, to obviate the necessity of having to supply the light from Glasgow. The buildings have been completed, and the erection of the machinery and plant nearly so. The new iron railway bridge for the same company across the upper end of Ayr harbour, and giving access to the south side of the harbour and the Ayr shipyard for the first time, is being finished, and will soon be ready for traffic. A new shoe factory has been erected in the neighbourhood of Newton-on-Ayr Station, and is now in operation. In addition to these, a number of dwelling-houses, comprising villas and blocks of workmen's dwellings, are being erected in all parts of the town where there is vacant ground, and especially in the Craigie district.

BUILDING IN EDINBURGH.—Notwithstanding that there was a falling-off in the value of work passing through the Dean of Guild Court in 1900, amounting to 347,317*l.* less than the previous year, it is again to be recorded that the year just ended shows a further decrease of 190,610*l.* From the statistics of the Dean of Guild Court for 1900 the number of warrants granted, including minor warrants, reached the total of 884, of an approximate value of 829,950*l.* These warrants referred to fifty-seven villas, seventy-four self-contained houses, 225 public and other buildings, 590 alterations, eighty-two tenements containing forty-three shops, and 962 dwelling-houses. The work that passed through the Court last year represented 782 warrants, of an approximate value of 630,340*l.* These warrants embrace thirty-six villas, 126 self-contained houses, 148 public buildings, 398 alterations, fifty-six tenements of fifteen shops, and 537 dwelling-houses. There has thus been a considerable diminution on all classes of buildings

* Royal Academy Exhibition.

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during the year with the exception of self-contained houses. About 57 per cent. of the tenements passed during the year still remain to be built, and a number of the buildings erected during the year form part of warrants granted during the two previous years. It is expected, however, that as there is now a time limit to the duration of the warrants a number of buildings will be proceeded with during the ensuing year. It is evident from the increase of self-contained houses that they are more in demand than houses in tenement property. In apportioning the work to the various districts for the year, and taking Newington, Grange, Blackford, and Morningside district, there have been passed and in operation during the year about sixty villas and self-contained houses and twenty-two tenements. A new feature in Blackford district has been the erection of a number of self-contained houses near Harrison Arch, and facing Blackford Avenue, the name applied being Ladysmith-road. A number of villas and self-contained houses have been built in St. Fillan's Terrace, Craiglea, and Comiston Drives, Hermitage and Cluny Drives, Corrennie Drive, Dalhousie Terrace, and Craighouse Terrace. Gorgie, Colinton, and Polwarth districts may be taken as representing the area where the largest portion of buildings passed during the last two years have not yet been erected. Notwithstanding, the work executed during the year compares favourably with that of last year. In Comely Bank, Inverleith, and Stockbridge the operations have been much the same as last year, but the preponderance of the work has been transferred from the tenements to the self-contained houses. Public and other buildings last year, more than any other for some time past, have received considerable attention, notably the Caledonian Railway Hotel, the North British Railway Hotel, and the *Scotsman* office buildings, the Municipal Buildings, additions to the Register House, premises in Rose-street, Princes-street, Frederick-street, and St. Andrew-square; addition to Heriot-Watt College, the reconstruction scheme of the United Free Church Assembly Halls, additions to Royal Infirmary, premises at Tollcross for Players' Riding School, new commercial bank at corner of Queensferry-street and Shandwick-place, and the Wesleyan Methodist Mission Hall at Tollcross. The St. Cuthbert's Co-operative Association are erecting new business premises in rear of present property. Continuing public buildings in the Merchiston and Slateford district, the largest contract is for the North British Rubber Co., Gilmore Park, on the east and west side, where opportunity has been taken of making a considerable widening of the street. Additions have been made to M'Ewan's Brewery, Fountainbridge, and there has been an addition to the North British Distillery at Slateford. In the northern district there have been one or two schemes of note, viz., the completion of the widening of Stockbridge Bridge on the east side. In Hamilton-place St. Cuthbert's Co-operative Association are erecting business premises of shops, with dwelling-houses over to the front, with manufacturing premises in rear. In Warriston-road Messrs. Waterston & Son are engaged with the erection of business premises. A place of amusement for this locality has now been furnished by the fitting-up internally of a large building in St. Stephen-street as the Tivoli Theatre. In Abbeyhill and south side districts there has been completed during the year the premises in Moray Park, and additions have been made to the premises of Messrs. Redpath, Brown, & Co, Easter-road. Excavations are in progress in London-road for large printing works between Dalziel-place and London-road United Free Church. The bonded stores at St. Leonard's, recently destroyed by fire, are being reconstructed on a very much more extensive scale, with a building of Scottish Baronial character, while a large addition is also being made to St. Leonard's Brewery. While the new United Free Church at Gorgie and St. Stephen's United Free Church have been opened during the year, there is in operation at the present time for the Established Church denomination a new church for the Dean parish, also a new church at the foot of Dalkeith-road for the Prestonfield congregation. Large additions are in progress to Merchiston Castle School, and also to the Episcopal College in Orwell-place. During the year three new schools have been erected—viz., New-street, Parson's Green, "Flora Stevenson," Comely Bank—while in Ashley-terrace, for the Merchiston district, a new school will shortly be fully equipped. Workrooms, laboratories, and cooking classrooms are being attached to many of the existing schools throughout the city. The Lord Provost and magistrates have been mindful of the housing of the working classes, no fewer than 196 houses having been erected, situate in West Port, 61; Bedford-crescent, 20; Dean-street, 18; Potter-row, 31; Pipe-street, Portobello, 66. The St. Giles' Dwelling-house Association, Ltd., having acquired the old property in Grange-court, Causewayside, are at present reconstructing the whole premises, which, when finished, will provide thirty-seven houses. A landmark, it may be recalled, has been removed in George IV. Bridge by the demolition of the County Buildings, to make room for the new and more commodious premises required for county administrative work.—*Scotsman.*

BUILDING IN GLASGOW.—Throughout the year the various trades connected with the building industry have been fairly prosperous. Early in the year the operatives connected with one of these trades submitted gracefully to a small reduction in their standard wage. Those connected with another resisted a demand made by their employers for a slight reduction, which caused a cessation of labour to some extent for some weeks in that trade. But as a large number of the employers had contracts which had to be completed to enable the premises to be occupied at the term of Whit Sunday, and as the Exhibition buildings were in the hands of a large number of the operatives of that trade, a cessation of labour at which could not be thought of in any circumstances at the time, the result was that the short struggle terminated in a nominal victory at least for the operatives, although there are too good reasons for stating that reductions in many instances have since taken place, and the standard rate in the trade is not altered. During the last two years there has not been so much dwelling house property of the tenement class built as there was for some years previous, but a considerable amount of villa and cottage property has been built in several of our suburbs, which has been well taken up, and in many cases has changed ownership at remunerative prices to the builder, notwithstanding the high prices paid for building materials, and there are good prospects of the demand for this class of property continuing for some time yet. In that period a considerable amount of warehouse and office property has also been erected, but there are ominous indications that the supply of this class of property is at present somewhat in advance of the demand, notwithstanding there are some important contracts in this class of property in preparation. The railway extensions which have been in progress for these years, and are still going on, have had a good effect in keeping the operatives employed, and these are by no means exhausted yet, but will also employ a large number throughout the coming year. Our Corporation, as Improvement Trustees, have also some large contracts in preparation as well as in progress. Altogether considered, those engaged in those trades may look forward with hope as well as back with pleasure. As to the linings granted by the Dean of Guild Court during the year, for two years there has been a downward tendency in the number granted.—*Glasgow Herald.*

BUILDINGS FOR NEWCASTLE.—At a meeting of the Newcastle Town Improvement Committee a few days ago plans for the new Empire Theatre were presented on behalf of the Moss Theatres Co., Ltd. The building is to be erected in Newgate-street, and will take in a large amount of additional frontage in that street. The plans, as presented, were not absolutely completed, and had to be held over for another meeting for certain alterations. Plans were also submitted to the Committee for a large block of property to be built on the site of the Blackett-street Presbyterian Church, which property has been purchased by Mr. Emmerson, jun., licensed victualler. The plans show business premises on the ground floor, with cellarage beneath, and on the six floors above there will be suites of offices, to be reached by means of lifts in addition to the ordinary staircase. The Committee allowed the plans to pass.

BUILDING IN PERTH.—The number of petitions for lining presented to the Dean of Guild Court for 1901 is the smallest since 1893. The end of 1900 saw nearly all the branches of the building trade pretty well employed, but since then, owing principally to the high price of material and labour, work has become scarcer, and a considerable number of men have been paid off. Buildings in course of erection at the end of 1900 and now completed include the Central District School for the Perth School Board; Consumptive Hospital at Barnhill; and the General Accident Assurance Buildings, corner of Tay-street and High-street. The Royal Bank Buildings, in New Kinnoull-street, are not quite completed. The petitions for the year comprise sixteen of the villa type, principally in Glasgow-road and Craigie district. Tenements have passed the Guild Court for erection in Needless-road, Gowrie-street, Craigie, and Upper Craigie. The Corporation have completed the erection of the new gasworks at the Friarton and electric light station at the Shore, and are now completing the large blocks of working-class houses in Old High-street.

BUILDING IN SHEFFIELD.—Although there are evidences on every hand of a slowing down in the building trade, much business has been done in the course of the year just ending. This is shown by the fact that the Highway and Sewerage Committee had during the twelve months no less than 1,452 plans for buildings and streets laid before them as compared with 1,425 in the preceding year. The various municipal authorities—Corporation, School Board, and Sheffield Guardians—have been busy, while contractors have been kept well employed completing building operations on plots already opened. The necessity for more houses on the outskirts of the city—one result of the effective tram service to the different suburbs—was apparent, but some of the most beautiful outlying districts are undoubtedly being spoilt by the jerry-builder. So much has been said and written on this subject that it is scarcely worth while writing more upon it, but on every side it is agreed—except by the jerry-builder himself and those financing him—that it is a pity the city authorities have not greater powers in this respect. The Corporation have made considerable progress with the Crofts area during the year. A number of workmen's tenements have been erected, and some of them are already occupied. Altogether there will be two shops and 124 tenements, of which sixty-two are two-roomed tenements, letting at 5s. per week; fifty-four are three-roomed tenements at 7s. per week; and eight are one-room tenements at 3s. per week. The cost of these dwellings is estimated at 28,500*l.* The proposed model lodging-house will accommodate 380 persons, and will cost, approximately, 25,000*l.* Twenty-two cottages have also been built for working men in Hands-lane, at a cost of 5,500*l.* The rents vary from 6s. 6d. to 6s. 9d. per week, and all the dwellings are now occupied. The smallpox hospital in Crimicar-lane, Fulwood, is now nearing completion. Two large wards have been erected, one for males and the other for females, and each to be provided with twelve beds. There is also an isolation block, and there are laundries and an administrative block. The latter have been built so that they will meet the requirements of no less than eight hospital blocks, six more than are at present being erected. The City Surveyor's staff have been very busy with tramway work during the year; the reconstruction of Tinsley car-sheds, the building of a new car-shed in Queen's-road and other schemes. Near the Queen's-road shed, on the other side of the railway, and on the site of the old Olive-grove football ground, the erection is nearly finished of the first instalment of a depôt for the Highway Department. The new buildings consist of stables for about thirty horses, with hay and corn and other stores—large sheds for carts and waggons, loose horse boxes, weigh-houses, homes for the foremen, a large mess-room, and baths for the workmen. The work now in progress will cost about 12,000*l.*, but the complete scheme will be very much more expensive. Amongst other work in hand or completed by the Corporation is the destructor in Penistone-road, a twelve-cell destructor with a chimney 186 ft. high. A new bridge has been made over the River Loxley, and generally everything has been done for efficiently dealing with a large portion of the city's refuse. The cost of the scheme when complete will be about 30,000*l.* The City Surveyor is, on the instruction of the General Purposes and Parks Committee, preparing plans for a lodge and conveniences at each of the parks not so equipped in the city, and for conveniences at recreation grounds. A lodge and other buildings are being erected at the Brightside Recreation Ground. The staff working particularly under Mr. Green, the principal building inspector, have been kept fully employed during past year. In the centre of the city there have been many instances of enlargement and alteration of premises. Building has also been proceeding rapidly in many of the suburbs.—*Sheffield Telegraph.*

BUILDING IN STONEHAVEN.—The building trade has been in a fairly prosperous state during the whole year, and the builders have still sufficient work on their books to keep the usual number of hands fully employed till well into the new year.

COUNTY SCHOOL, MILFORD, AND NEW POST OFFICE, SWANSEA.—In reference to the paragraph relating to these buildings, which appeared in our last issue, we should have mentioned that the floors at the County School, Milford, have been laid with Roger Lowe's patent redwood wood-block flooring, and at the new post office, Swansea, with pitch-pine and maple flooring.

FREE CHURCH TRAINING COLLEGE, GLASGOW.—A scheme of extension has been completed in connexion with the Free Church Training College, Glasgow. The new building is of four stories to the street front, and the external walls are executed in a local white stone. Accommodation on the first floor consists of a chemical laboratory and two classrooms. Above these are the sewing and art rooms. Cloakroom and lavatory accommodation has been provided, as well as a house for the janitor, which is situated on the ground and mezzanine floors. Electric light is installed throughout, and the building is heated with hot water. There is connexion on each floor with the present College, which has been renovated and altered to provide extra accommodation, a new lunchroom and manual workshop having been added. The cost of the building is about 6,000*l.* The architects are Messrs. H. & D. Barclay, Glasgow.

SCIENCE BUILDINGS, WATFORD ENDOWED SCHOOLS.—Sir William De W. Abney, K.C.B., principal Assistant Secretary of the Board of Education (Secondary Branch), recently opened the new science buildings in connexion with the boys' side of the Endowed Schools at Watford. The completion of the science block recently made has been carried out by Mr. C. P. Ayres, the architect who designed the original buildings in 1883, the contractors being Messrs. Clifford & Gough. The new rooms comprise a lecture room, a physics laboratory, museum and balance-room, a preparation-room, and a dark room. The building is entirely on the ground floor. Its longest elevation (93 ft.) faces the Derby-road, and is in a line with the main school buildings, from which, however, it is entirely separated. The exterior of the science block is faced with Leverstock grey and red bricks, and the roofs are slated, the whole being designed to correspond with the original school buildings. Internally the walls are faced to a height of 4 ft.

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with the Wortley Co.'s salt-glazed bricks, and above that height to the springing of the roofs with white Arlesey bricks. The floors throughout are laid with Roger Lowe's pitch-pine blocks, except in the museum, which is floored with Ebner's Venetian marble mosaic. The entrance from the playground opens into the museum-room and balance-room, a vestibule (37 ft. 9 in. by 11 ft.), into which open all the rooms in the building. The physics laboratory has an open-timbered roof and a floor space of 31 ft. by 27 ft. Large solidly constructed teak-topped tables accommodate twenty-six students, while fourteen other working places are provided upon slate-topped tables, supported on brick piers, and arranged round the walls under the windows. The dark-room, or optical-room (21 ft. 3 in. by 12 ft.), is entered from the physical laboratory, and is constructed under the gallery of the lecture-room. A bench is fixed along the greater length, for use in photometry and other experiments in the study of light. The lecture-room (27 ft. by 21 ft. 3 in.) has an open-timbered roof. Between the lecture-room and the chemical laboratory is the science masters' preparation-room, 21 ft. 3 in. by 10 ft. The chemical laboratory, with working benches for twenty students, and the woodwork-room, with twenty benches, complete the block. The building is heated on Stainton's medium pressure hot-water system, and lighted by electricity from the cable of the Urban District Council, the latter work having been executed by Mr. Harold Downer.

PROPOSED NEW DRILL HALL, EASTBOURNE.—It is proposed to erect a new drill hall at Eastbourne. The frontage of the new building to the road will be 80 ft. The front elevation will be of red brick with stone dressings, with green-slated roof and tower; and the front part of the ground floor of the structure will include hall and vestibule, lavatory, officers' room, orderly-room, canteen, sergeants' mess. At the back the drill hall (with access from the front hall and side) will be 100 ft. by 50 ft., and there will also be a model shed, field works store, kitchen, clothing store, and armoury. The side premises will consist of coal-shed, stable, magazine, and lavatories; and the large open parade and drill yard will be 70 ft. by 60 ft. The first floor over the front portion of the ground floor will be approached by a wide stairway. The lecture hall and recreation-room will be 50 ft. by 20 ft. Plans for the work have been prepared by Mr. A. A. Oakden, of Eastbourne.

STAINED GLASS AND DECORATION.

WINDOWS, RUBISLAW PARISH CHURCH, ABERDEEN.—Rubislaw Parish Church has been improved by the filling in of the apse windows, nine in number, with stained glass, designed and manufactured by Mr. John Whyte, Aberdeen. This church is being further improved by the introduction of electric lighting.

DENHOLME CHURCH, BRADFORD.—A stained-glass window has just been placed in this church by Mr. and Mrs. Greenwood Shackleton, of Girlington, in memory of their two sons. The subject of the window is our Lord walking on the sea, and the work was designed and executed by Messrs. Powell Bros., of Leeds.

SANITARY AND ENGINEERING NEWS.

WATERWORKS, IPSWICH.—Mr. E. A. Sandford Fawcett, A.M.Inst.C.E., Local Government Board Inspector, sat at the Town Hall, Ipswich, on the 20th ult., to inquire into an application of the Town Council for sanction to borrow 20,240*l.* for waterworks purposes—mainly in connexion with the construction of a new reservoir. Mr. Hamlet Roberts (Water-works manager and engineer) stated that the number of houses at present supplied with water from the Corporation mains was 15,350; the number in 1893 was 12,197. Building was still proceeding extensively on all sides of the borough. The source of supply was partly from gravitation, and partly from deep wells in the chalk. He measured the gravitation supplies a year or two since at about 122,000,000 gallons per annum. The quantity pumped last year was 356,613,500 gallons, being an increase of 11,221,560 gallons on the previous year. The measures of sanitation pressed on by the Public Health Committee of the borough meant a considerable increase in the water consumed. The present reservoir accommodation on the high service was about 1½ million gallons in two reservoirs. There was also a third reservoir, into which the gravitation supply flowed, on the Spring-road, capable of containing half a million gallons. When he made his last report, in April, 1901, he took the population of the borough according to the report of the Medical Officer of Health for the borough at 63,552, and the consumption gave an average of 20·63 gallons per head per day of the population, including trade and domestic supplies; but the census taken this year showed the population to be 66,622. He had for some time urged upon the committee the importance of providing increased accommodation, and with a view to that the Corporation had acquired the land immediately adjoining the present reservoirs on the Park-road, which was the highest point in the whole borough, as a site. Under the directions of the Committee, he had prepared a scheme and plans, &c., for the construction of a third high-level reservoir, capable of containing about 4,000 000 gallons.

SEWERAGE, NEWNHAM CROFT, CHESTERTON.—Messrs. Waters & Worrall, of Cambridge, have been instructed to prepare a scheme of sewerage for Newnham Croft, in the Chesterton Rural District.

PUMPING STATION, CLEVEDON WATER WORKS, SOMERSETSHIRE.—The Clevedon Water Co. have recently enlarged their undertaking, under the direction of Mr. James Mansergh, C.E. A new well has been sunk and new mains laid, and a new pumping station, designed by Mr. H. Dare Bryan, architect, Bristol, erected. The buildings comprise the engine and boiler houses, coal store and workshop, and the engineer's lodge. Local pennant stone with white pointing is used for the walls except for the lodge, which is built of a yellow magnesium limestone, the upper part being tile-hung. All the roofs are of Broseley tiles, the turrets being covered with oak shingles; the windows have Bath stone mullions and clear glass in wide lead frames. The work has been carried out by Messrs. Chancellor & Son, of Bath, under the superintendence of the architect, with Mr. W. H. Lewis, of Bristol, as clerk of works.

FOREIGN.

FRANCE.—M. Roger Ballu, Inspecteur des Beaux-Arts and son of the eminent architect of the Paris Hôtel de Ville, has been superseded in his office in consequence of having made a political speech against the Government.——The Lycée Charlemagne, at Paris, which is established in a former convent of the Jesuits in Rue St. Antoine, is to be enlarged.——The construction of a new Post-office building is to be commenced at La Rochelle.——A new monument, to the deputé Baudin, the work of M. Boverie, has just been inaugurated at the junction of the Faubourg St. Antoine and the Avenue Ledru Rollin, Paris. It is intended to erect near the same point, shortly, a monument to Boulle, the celebrated carver and furniture designer of the eighteenth century.——The historic château of Leseure, near Lodève (Hérault), has been completely destroyed by fire. It contained a valuable collection of pictures, furniture, and works of decorative art.——A second bridge is to be built over the Rhumel, at Constantine, at an estimated cost of 450,000 francs.

GERMANY.—Plans for a new police office at Wiesbaden having been submitted to the German Emperor, he has exercised his veto respecting the design, and has ordered them to be practically cancelled, suggesting a complete change throughout.——The Emperor has given permission for the erection of a monument to the late Herr Treitschke, the historian, in front of the Berlin University.——During the past year the quantity of basalt columns quarried in the Rhenish provinces has surpassed that of any previous year. They are extensively employed for engineering works, especially for protective sea-walls, docks, river works, as railway sleepers, and for general building purposes. This material is largely broken into macadam for roads, and in that connexion is also extremely useful.

GREECE.—The first national theatre erected in Greece in modern times has just been inaugurated at Athens. The building is capable of holding nearly a thousand people, and is a notable addition to the public buildings of that city. It cost about 1,000,000 fr

AUSTRALIA.—The Committee of the fund for the erection of a memorial to her late Majesty Queen Victoria in Melbourne, Victoria, are inviting designs from sculptors for a statue of the Queen in marble or bronze. The competition closes in London on May 1, and in Melbourne on June 2 next.

INDIA.—Large station buildings are about to be erected at Puliyur, on the Southern India Railway, to take the place of temporary buildings put up when the station was opened in 1889.——A permanent bridge over the Kabul river at Nowshera is about to be constructed; the expenditure has been sanctioned, and the work will be executed under the superintendence of the Engineer-in-Chief of the North-Western Railway.——A question of some moment, but by no means new, has been raised in reference to the upkeep of State Residences in India. It is being solved by experts, who will confer with the Imperial Government and submit a Report.——An important work has recently been finished in the Prince's Dock, Bombay. New gates have been fixed of iron and steel, with greenheart heel and meter posts and sill pieces, built by the Thames Ironworks Shipbuilding and Engineering Co. They were sent from England in pieces; each leaf of the gate weighs about 96 tons, and measures 37 ft. 5 in. long by 32 ft. 6 in. high.

PROPOSED DUST DESTRUCTOR, STOKE NEWINGTON.—The Stoke Newington Borough Council propose to erect a dust destructor at the rear of the Town Hall in Milton-road. In connexion with the scheme swimming-baths are to be erected in Albion-road, and it is hoped that the heat generated in the destructor will be sufficient (or partially so) to heat the water. Much opposition is being raised to the dust destructor by the inhabitants of the district. The proposed destructor will be situated within 250 yards of the borough boundary.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. J. S. Gibson, architect, has removed his offices to 27A, Old Bond-street, W., where he will carry on practice in partnership with Mr. William Wallace under the style of "Wallace & Gibson."——Messrs. Young & Brown, quantity surveyors, have removed their offices from 7, Southampton-street, Bloomsbury, to 104, High Holborn, W.C.——Messrs. Drew-Bear, Perks & Co., constructional engineers, have converted their business into a limited company; Mr. Drew-Bear becomes chairman and managing director and the other parties will be directors; the management of the business will therefore be as heretofore.——Mr. W. Walford Ridley and Mr. Owen Ridley have retired from the firm of W. Ridley & Sons (timber, slate, and cement merchants, of Reading, Staines, and London). The business will be continued by Messrs. E. William Ridley, Lionel H. Ridley, Edgar O. Ridley, and Edward G. Ridley, who have been members of the firm for many years.

THE LABOUR MARKET IN THE COLONIES.—The January circulars of the Emigrants' Information Office, 31, Broadway, Westminster, state that the Report for 1900, recently issued under the Factories Act, shows that the number of factories and employees in *New South Wales* comprised within the Act both increased, and that trades were generally prosperous. In Sydney wages in many trades, as the building trade, have risen, but wage-earners complain that the cost of living is rising in greater proportion owing to the proposed new Federal tariff. The building trade is now less active than it was, but all other trades continue to be fairly well employed, and there is still some opening for general mechanics, plumbers, joiners, carpenters, and good labourers. In *Victoria* there is no general demand for more labour, but a competent mechanic has not much difficulty in finding work. In *South Australia* there is practically no demand for more mechanics in the towns, but a skilled hand, such as a mason, bricklayer, engine fitter, blacksmith, joiner, or carpenter, can generally find employment after looking about for a little. In *Queensland* it appears from the Report of the Government Labour Bureau for 1900, which has recently been issued, that, owing mainly to the scarcity of employment caused by the long drought, the general supply of labour was in excess of the demand. Reports received at the end of 1901 show that the state of the labour market in Queensland has not materially changed since that Report was issued. The Report of the Government Labour Bureau in *Western Australia* for the quarter ending September 30 last shows as follows:—There is a demand for men in the building and other trades at Northam, York, and two or three other places, but the supply of men is sufficient at Perth, Fremantle, Albany, and all other towns, while at Coolgardie, Kalgoorlie, Boulder, and Collie the supply is in some cases actually greater than the demand. In *New Zealand* the building trades have been busy almost everywhere (but not at Wellington or Dunedin), and at Invercargill bricklayers have been in demand. The engineering trade is not giving full employment to men at Dunedin and Wellington; but elsewhere it is fairly good, and in Auckland blacksmithing and boilermaking have been brisk. In *South Africa* no one is now allowed to land without a permit. This must be applied for at the Permit Office, 39, Victoria-street, London, S.W. The applicant must possess 100*l.*, or prove that he is in a position to maintain himself in South Africa. Applicants living within fifty miles of London must apply in person. These permits are no guarantee that the holders will be allowed to proceed inland. Only refugees, Government employees, and persons engaged in a service of a public nature will be permitted to proceed to the Transvaal.

SUBSIDENCES IN THE CITY.—In certain properties in Finsbury-pavement cracks have appeared, not only in upper floors but in basements. In several cases the movement has assumed, it is stated, serious proportions, and the inference is that the settlements are due to railway works beneath the thoroughfare. Surveyors acting on behalf of property-owners and the railway companies are drawing up reports on what has taken place. One of the buildings that has suffered extensively is the Moorgate-street Station of the City and South London Railway.

BUILDING EXCHANGE IN SHEFFIELD.—The master builders of Sheffield are at present engaged in erecting the first trade exchange in the city. They have secured a suitable site in Upper Charles-street, upon which they are building premises. There is to be a large hall devoted specially to the purposes of those engaged in the trade, whilst other parts of the building are to be set aside for social requirements. It is anticipated that the new premises, the cost of which will be something like 8,000*l.*, will be opened in the early part of the year. The membership will be confined to those in the building and allied trades. Following an old-established custom, the directors of the newly-formed company—consisting of prominent members of the Master Builders' Association—gave the "rearing" supper on the 19th ult., the event taking place to mark the completion of the building so far as the roof. The repast was partaken of at Sheard's Dining Saloon. Mr. J. Biggin, chairman of

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directors, occupied the chair, his colleagues present being Messrs. James Longden, A. Mastin, J. D. Cooke, H. H. Hodkin, A. Bradbury, and W. J. Spink (secretary). There were also present Messrs. G. E. Powell, J. S. Teanby, J. Dawes, W. Proctor, W. H. Booth, J. C. Warring, and F. Naylor, together with some 100 workmen.—*Sheffield Telegraph.*

PUBLIC IMPROVEMENTS AT GRIMSBY.—At the Town Hall, Grimsby, on the 19th ult., Colonel Coke, Local Government Board Inspector, held four inquiries into applications of the Town Council to borrow money for improvements. The first inquiry was respecting the proposed erection of a refuse destructor, at a cost of 10,500*l.* It is proposed to erect the destructor on freehold land belonging to the Corporation, adjoining the electric lighting works in Doughty-road. The Council had provisionally accepted the tender of the Horsfall Destructor Co., of Leeds, for the plant and machinery, at 8,507*l.*, and 2,000*l.* would be required for boiler, weighing-machine, and outbuildings. The second inquiry was into the application to borrow 8,033*l.* for a proposed new park in the Clee district. It was explained that Mr. A. W. Grant-Thorold had given nine acres of land for the park, on condition that the Council enclosed it with iron railings, and made and maintained roads all round it—the cost of the latter to be borne in equal proportion by himself and the Council. The Inspector then inquired into the proposal to borrow 2,020*l.* for street improvements and for the formation of new streets; and the last inquiry was with regard to the proposed borrowing of 124*l.* for relaying sewers. There was no opposition to any of the schemes.

AMENDMENT OF THE PATENT LAWS.—It is announced, in response to resolutions passed by the Association of Chambers of Commerce of the United Kingdom at their meeting held in Nottingham last autumn, that the President of the Board of Trade has given instructions for the drafting of a Bill to give effect to the recommendations of the Committee appointed in May, 1900, with Sir Edward Fry as chairman. In our issue of May 25 last we described the general object and scope of the enquiry that had been undertaken by the Committee, and the changes which they considered could be advantageously introduced into existing procedure so as to diminish the grant of invalid patents, and to establish a system of official examination into the novelty of an invention before its final acceptance for the sealed grant of letters patent.

BUILDING AFFAIRS IN WÜRTEMBERG.—Reviewing the trade and finances of Würtemberg for the past year, Dr. Frederick Rose, British Consul at Stuttgart, in a report to the Foreign Office, observes, with reference to the depression that made itself felt in the latter part of 1900:—"The decline in the building industries, which was without doubt partially caused by the artificial increase of the prices for building sites in and near large towns, affected in its turn those industries which are dependent upon building operations for their development, such as sheet-iron, brick and cement works, and saw-mills. In some large towns the decline of the building industries and their allied branches was productive of most serious crises, which were again further aggravated by the failure of several important mortgage banks. . . . . The great increase in the number of new buildings and streets—a sure indication of commercial prosperity—which was manifested during the four or five preceding years ceased more or less completely in 1901. The principal reason was naturally the state of commercial depression evidenced in different directions, in the general feeling of uncertainty and insecurity, in the high price of money, the fall in the values of State loans and industrial shares, and in the great difficulty experienced in obtaining money on mortgage. It seems also that the introduction of the German Imperial General Civil Code, with its new formalities and enactments, caused many difficulties. In consequence, the business effected in real estate suffered materially, being, for example, for the town of Stuttgart only 1,250,000*l*, compared with 2,550,000*l.* in 1899. In spite of the decrease in building enterprise, the production and sale of bricks and tiles were fairly satisfactory for 1900, the depression making itself felt more in the manufacture of other building materials—for example, in mortar, plaster of Paris, and cement. The manufacture of cement suffered in Würtemberg in a similar degree to the rest of Germany. The majority of the cement works of South Germany have formed a trust to regulate prices, and negotiations are on foot with a view to inducing all the German manufacturers to join."

LONDON STREET LIGHTING.—It is announced that the City of Westminster Borough Council have decided, for experimental purposes, to provide some oil lamps, having a flame that burns with compressed air, which it is expected will prove to be a source of stronger light in foggy weather. Of the twenty new lamps, some will be set up in places of heavy cross traffic, including Leicester-square, Trafalgar-square, Piccadilly-circus, and Buckingham Palace-road. About eighty householders living in Portland-place have addressed a request to the Marylebone Borough Council asking that the provisional installation of the Kitson incandescent lamps lately made down the middle line of the roadway may be retained instead of electrical lighting for which the Council have obtained powers.

ST. JAMES'S CHURCH, HEREFORD.—A fire that broke out on the morning of December 23, consumed the entire interior of the building, the walls and vestry alone remaining. The church was erected in Bartonsham, for a new ecclesiastical parish taken out of St. Owen's, in 1869, after the designs of Mr. Thomas Nicholson, senior member, we believe, of the present firm of Nicholson & Son, of Hereford, at a cost of 3,200*l.* for the fabric—the tower and spire excepted. The church, constructed of stone, for 600 sittings, is cruciform on plan, with a nave, 72 ft. long, of four bays, transepts, two aisles that extend eastwards beyond the transepts for an organ-chamber and seating-room, a sacristy, and south porch. The valuable organ and a large collection of books have perished, and it is stated that the damage is only partly covered by insurance.

CAPITAL AND LABOUR.

BRISTOL BUILDING TRADE.—The Bristol Master Builders' Association have given six months' notice to reduce the wages of all employees by one penny per hour. Slackness of trade and the overflow of the labour market are assigned as the reasons, there being more men out of work than for several years past. The war has seriously affected trade, and the enhanced cost of labour and material has checked building enterprise. At present skilled workmen are receiving 9*d.* per hour, averaging 2*l.* per week. The builders labourers earn about 27*s.*

STONEMASONS' WAGES, BURTON.—The operative stonemasons of Burton have commenced an agitation for an increase in their rate of pay and certain other improvements in their working conditions. They have given notice to their employers accordingly. They ask for an increased pay of a penny per hour, from 8½*d.* to 9½*d.*, and for working hours in winter to be altered from 49½ to 47. On the apprenticeship arrangement, whereby one apprentice is allowed for six masons, they ask that masons' sons, hitherto exempt from consideration, shall count as an ordinary apprentice. Amongst other minor concessions is one dealing with time allowance for out of town work. An hour is allowed for three miles from the borough boundary; the men now suggest the distance shall count from the railway station.—*Nottingham Guardian.*

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

15,650.—APPARATUS FOR SETTING SAW-TEETH: *C. McDonner.*—A base-plate and a bracket which is bolted to it constitute the frame. The edge of an anvil, which is fixed with a set-screw in a recess at the end of the plate, is bevelled at an angle to correspond with the set of the teeth. At the end of the bracket is an opening for a feathered punch, which is sustained with a spring, its end being bevelled to agree with the anvil. For taking the set out of the saw-teeth a flat anvil and punch are employed.

15,683.—A VENTILATOR: *W. Edwards.*—A baffle is placed inside a box, which is affixed to the ceiling or roof next over the lower openings through which vitiated air will escape, as conveyed by side slots to the valve-openings, and so deflected towards the outlet. Under normal conditions the flaps and valves of the openings hang perpendicularly, but a down draught will shut the valves, or they may be closed with a turn-plate.

15,696.—AN AUTOMATICAL BRAKE FOR CRANES: *H. F. Coles.*—For a travelling crane worked upon an incline a spring clutch is carried upon one of the carriage axles for engagement with and driving a band-brake disc whilst the crane travels downwards along the incline. The clutches will become disengaged whilst the carriage moves in the opposite direction.

15,720.—TREATMENT OF SEWAGE SLUDGE, &C.: *A. Bayer.*—The sludge resulting from the addition of mixed pulverised coke or charcoal, caustic lime, and zinc dust to sewage and similar effluents is pressed into cakes, from which charcoal, illuminating gas, tar, and ammoniacal water are then obtained by a process of destructive distillation, which partly recovers the lime and zinc for renewed use. The liquid part of the sewage, as treated with precipitants, is filtered through charcoal, whilst other parts may be treated with charcoal obtained by the destructive distillation of slaughter-house refuse, &c.

15,730.—AN ELECTRICAL INSULATION MATERIAL: *A. Matheson and M. Tatham.*—A compound, equally available as an electrical cement, is made by mixing sulphur with diatomite whilst melted and a hydro-carbon.

15,736.—DUMPING WAGGONS AND TIPPING CARTS: *W. O. Shadbolt.*—A rocking bar carries the springs that support the body of the waggon, and are joined to a spring bar, of which the side ends are laid in recesses in the frame; the hinged tail-board or gate is locked with pivoted latch levers set in engagement with lugs and chained to the frame, whereby, with the tipping of the body, the gate is liberated. Provision is made for regulating the dumping motion, and for the automatical opening of the gate by means of a chain joined to the frame, and pivoted levers that are chained to pivoted levers which support the gate.

15,774.—AN AUTOMATICAL FIRE ALARM: *W. Clar.*—In a battery circuit are placed a bell and an electrical lamp, and the circuit is normally broken between the spring contacts of the circuit-closer, which are joined through springs to threads which are disposed in the room, &c., for which protection is sought with their ends so fixed that the tension will keep the contacts separated. The springs are released and the alarm circuit closed by the burning of one of the threads or by its being broken with the hand if one desires to forward an alarm signal in the absence of fire. The threads are fitted with fusible connexions, in order that they may break at any given temperature, or they may be impregnated with substances that will cause them to ignite through heat only. The fusible connexions, in the form of a plug or a ring, are composed of fatty and resinous ingredients, bismuth amalgam, or other similar substances which will melt at the predetermined temperature.

15,780.—CONSTRUCTION OF ROOFS: *W. Simon.*—For sloped or flat roofs the inventor devises hollow rectangular tiles sustained with joists on girders carried by pillars and joined, end to end, with blocks or plugs internally. Mortar or cement is filled in the tile ends, and dogs or brackets secure skylights to the joists.

15,781.—A CART FOR SEWAGE: *W. Defries and V. I. Feeny.*—A vacuum is created in the tank of a sewage cart or waggon, for the process of charging, by means of a pump that draws air through a chamber wherein a disinfectant or a deodorant has been mixed with the air or sprayed. When the charging is nearly finished, a float will rise and shut a valve at the end of a suction-pipe—a pump vacuum gauge will mark the closing. Otherwise, an indicator may be raised into a glass dome above the tank with a float. The disinfectant is lifted by a supplementary pump from the container into a reservoir and thence through a pipe to a pierced nozzle in the container.

15,792.—ATTACHMENTS FOR GLAZING PURPOSES: *H. F. Hannent.*—For fastening glass sheets to the sashbars of buildings, their corners are secured with screws and nails to stepped clips or washers.

15,830.—TILES, SLABS, MOULDINGS, &C., OF IMITATION MARBLE, GRANITE, AND SO ON: *F. Tuckwell.*—A dry compound is made of white silver sand, Keene's marble cement, ground alum, with, it may be, litharge and Parian cement, and is then wetted to form a thin paste, of which slabs and tiles may be cast in shallow moulds having a bottom surface of glass or some polished metal. The backs of the tiles are coated with boiled linseed or litharge oil in order to render them damp-proof, and the slabs should be painted, stoved at 155 deg. Fahr., marbled or grained in colours, stoved at 250 deg. Fahr., varnished, and again stoved at 155 deg. Fahr., rubbed with rotten-stone, and polished with an admixture of turpentine, beeswax, and precipitated chalk. For plain colouring the articles are coated with enamel paint, stoved, and polished; coated with varnish, stoved, and then polished.

15,853.—APPARATUS FOR CRANES: *L. Bell and T. A. Bell (C. Bell).*—The friction-wheel on the drum-shaft will move in contact with either an auxiliary friction-wheel or a fixed brake-block. An extension from the lever that shifts the drum-shaft is joined to an arm of a shaft on which is a cam which bears against a friction-wheel, and also, as it turns in the opposite direction, against the first-named friction-wheel, for lowering the load. In another form the two wheels turn in the same direction, and are forced against the inside of the main friction-wheel, the cam being replaced with toggle levers.

15,861.—A HINGE FOR DOORS, GATES, SASHES, &C.: *F. A. Liddle.*—The flap of a sliding hinge is joined to a short tube passing through a slot in a long tube-shaped pin and sliding lengthwise in the pin which turns in sockets of the flaps, which are secured to the frame of the door or sash.

15,864.—A COUPLING FOR THE HOLDERS OF ELECTRICAL LAMPS: *W. C. C. Hawtayne.*—The coupling is intended for supporting the holders of standard lamps used for lighting streets. It has a cylindrical plug with two flattened wings which fits into a socket, which is secured to brackets on the standard or post, and is provided with channelled contact-pieces that correspond with contact-pieces of the plug fitted beneath a handle and an insulating plate.

15,884.—FASTENERS FOR WINDOW-SASHES: *W. F. Fakeman.*—Of the modifications of this contrivance one consists of a spring which is affixed to a bracket and engages with a shoulder upon the plate, or else a spring is used for forcing forwards a pivoted arm that can be pressed backwards with a lever carried by the bracket. When one opens the window the lever will be turned back by the lower sash, so that the pivoted arm can return to its normal place, and thereby be ready to secure the sashes when the window is again closed. In another adaptation a pusher, which slides in guides attached to the plate, serves to force the arm backwards.

15,890.—A COUPLING FOR ELECTRICAL WIRES: *S. Beeton and M. Barr.*—The coupling consists of a socket-piece for the one wire, which takes a conical plug upon the other wire, the parts being drawn to one another with a screw or a union, or some similar joint.

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15,901.—AN ADJUSTMENT FOR WORKMEN'S AND SIMILAR SQUARES, &c.: *F. Fontanella.*—The square is constructed of three-sided plates, which are screwed together, and are mounted upon a foot or base, and its front is glazed so that one may read the index of a level, pendulum clinometer, and plumbing instrument, whereof the dial is graduated in gradient-rates and angles.

15,921.—AN ELECTRICAL CUT-OUT: *W. le R. Emmet.*—In the case of fuses employed with a high-potential current with a point of rupture within a chamber which has a gas-vent for expulsion of the arc, a chamber is formed with recesses cut in two blocks of some insulating material, and the ends of the fuse-wire (which is put into the chamber) are connected to arms that are governed with springs, and will move outwards with the melting of the fuse, and thereby lengthen the arc. A vent-hole is made in the outer block, which is clamped to the inner block with a plate and screw-caps upon spring-arms; plug contacts make connexion with the leads. The recess has paper or similar capsules that may be wetted with a gas-producing material when the arc passes, and the blocks are protected with covers and side-plates.

15,932.—MEANS OF JOINING THE LENGTHS OF CONCRETE PILES: *G. L. Mouchel.*—Near the upper end of the lowest length of a hollowed concrete and metal pile (for which see No. 4,548 of 1900) are fitted pierced diaphragms so arranged that the upper one constitutes the base of a cavity at the end of the length of the pile; in the lower end of the length next above is made a similar cavity; thus the second length can be secured to the other by means of a concrete and metal core inserted into the cavities. When the lowest pile has been driven into its place, an extension from the core, of which the broken ribs fit the cavities, projects through the two diaphragms; and for further security of the two lengths are added a metal collar and forked metal rods to be embedded in quickly setting cement and forced down the pipe. For solid concrete piles having embedded metal skeletons the rods are caused to extend beyond the lower end of each length and to enter tubes that are embedded in the upper end of the next length below, in order to join the several skeletons to one another as the lengths are successively placed in position.

15,966.—APPLIANCE FOR TESTING GAS AND OTHER PIPES: *P. Kowalsky.*—The apparatus comprises a reservoir, of which an inlet cock regulates a current of air from an air-pump or squeegee-ball, and the outlet valve communicates with a union joined to the gas or other pipe and to a pipe fitted with a valve and with a pressure-gauge. The gauge should be formed of a U-shaped tube which, being filled in part with water, indicates leakage, of which the position may be discovered by pouring oil through an aperture that may be closed with a plug into a space underneath a pierced partition set in the reservoir and blowing air through a pipe into the oil. The vapour escapes out of the gas-pipe at the leak, which can be then detected with a flame, the vaporisation being aided with a wick mounted in a forked wire.

16,004.—A COMPOUND FOR MAKING REFRACTORY BRICKS, &c.: *W. S. Rawson and R. D. Littlefield.*—A mixture for moulded and baked bricks, crucibles, retorts, and so on, and also for the bottoms and linings of furnaces, is made up of calcined magnesite or magnesium oxide and a small part of a fusible boron, to which water is added.

MEETINGS.

FRIDAY, JANUARY 3.

Architectural Association.—Mr. J. A. Gotch on "The Development of Domestic Architecture from the Twelfth to the Eighteenth Century," illustrated by lantern views. 7.30 p.m.

SATURDAY, JANUARY 4.

British Institute of Certified Carpenters.—Monthly meeting at Carpenters' Hall. 6 p.m.

Sanitary Inspectors' Association.—New Year's Address by the President, Sir James Crichton Browne. 6 p.m.

MONDAY, JANUARY 6.

Royal Institute of British Architects.—Dr. A. S. Murray on "Two Ionic Capitals in the British Museum," illustrated by lantern slides. 8 p.m.

Liverpool Architectural Society.—Mr. James Parkinson on "Old English Cottages," illustrated by limelight views. 6 p.m.

TUESDAY, JANUARY 7.

Cardiff, South Wales, and Monmouthshire Architects' Society.—Paper by Mr. J. H. Phillips. 8 p.m.

THURSDAY, JANUARY 9.

Institution of Electrical Engineers.—Discussion of the Technical Reports on the Institution Visit to Germany, 1901, by the Committees on Traction, Light, and Power; Manufacturing, and Telegraphs and Telephones. 8 p.m.

Sheffield Society of Architects and Surveyors.—Mr. W. Watts on "Concrete and its Use."

Manchester Society of Architects.—(1) Special General Meeting for the purpose of Electing a Fellow and an Associate; (2) Mr. J. D. Crace on "Relation of Colour to Architecture." 6.45 p.m.

FRIDAY, JANUARY 10.

Architectural Association, Discussion Section.—Mr. P. W. Mulready on "The Work and Influence of Augustus Welby Pugin." 7.30 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. A. B. M'Donald, M.Inst.C.E., on "The Highlands of Central Europe." 8 p.m.

Birmingham Architectural Association.—Mr. John Ward on "Pictures from Penzance and the Land's End."

SATURDAY, JANUARY 11.

Dundee Institute of Architecture.—7 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 12 0	per 1,000 alongside, in river.
Rough Stocks and Grizzles	1 10 0	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 8 0	,, ,, ,,
Flettons	1 8 0	,, at railway depôt.
Red Wire Cuts ..	1 12 0	,, ,, ,,
Best Fareham Red	3 11 0	,, ,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,, ,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,, ,, ,,
Do., Bullnose	4 10 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 4 0	,, ,, ,,
GLAZED BRICKS.		
Best White and Ivory Glazed Stretchers.....	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,, ,,
Double Stretchers	10 0 0	,, ,, ,,
Double Headers..	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers..	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	14 0 0	,, ,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,, less than best.
	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	32 0	per ton, delivered.
Best Ground Blue Lias Lime..	25 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 28s. cd. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6½	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks ..	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup)	2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,
,, ,, 5 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	11 5 0	per 1000 of 1200 at ry. dep.
,, best seconds ,,	10 15 0	,, ,,
16× 8 best ,,	6 2 6	,, ,,
20×10 best blue Portmadoc	10 18 0	,, ,,
16×8 best blue Portmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green....	11 2 6	,, ,,
16× 8 ,, ,,	6 15 0	,, ,,
20×10 permanent green	10 0 0	,, ,,
16×8 ,, ,,	5 12 6	,, ,,

PRICES CURRENT (*Continued*).

TILES.

	s. d.	
Best plain red roofing tiles..	41 6	per 1,000, at rly. depôt.
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	£ s. d.	£ s. d.	
	At per standard.		
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	13 10 0	15 10 0	
Deals: best 3 by 9.....	13 0 0	14 10 0	
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	10 0 0	11 0 0	
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.	
Deals: seconds	1 0 0	less than best	
Battens: seconds	0 10 0	,, ,, ,,	
2 in. by 4 in. and 2 in. by 6 in. .	8 10 0	9 10 0	
2 in. by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0 0	
Foreign Sawn Boards—			
1 in. by 12 in. by 12 in.	0 10 0	more than battens.	
¾ in.	1 0 0	,,	
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft.		
	4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Swedish balks.....	2 15 0	3 0 0	
Pitch-pine timber (30 ft.).....	3 0 0	3 10 0	
JOINERS' WOOD.	At per standard.		
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0	
3 in. by 9 in.	20 0 0	21 0 0	
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	16 0 0	
Second yellow deals, 3 in. by 11 in.	17 0 0	18 0 0	
,, ,, 3 in. by 9 in.	15 10 0	16 10 0	
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	13 0 0	
Third yellow deals, 3 in. by 11 in. and 9 in.	12 10 0	13 10 0	
Battens, 2½ in. and 3 in. by 7 in.	10 10 0	11 10 0	
Petersburg: first yellow deals, 3 in. by 11 in.	19 0 0	20 0 0	
Do. 3 in. by 9 in.	16 0 0	17 0 0	
Battens.....	12 10 0	13 0 0	
Second yellow deals, 3 in. by 11 in.....	14 0 0	15 0 0	
Do. 3 in. by 9 in.	13 0 0	14 0 0	
Battens.....	11 0 0	12 0 0	
Third yellow deals, 3 in. by 11 in.....	11 10 0	12 10 0	
Do. 3 in. by 9 in.	11 0 0	12 0 0	
Battens.....	10 0 0	11 0 0	
White Sea and Petersburg:—			
First white deals, 3 in. by 11 in.	13 10 0	14 10 0	
,, ,, ,, 3 in. by 9 in.	12 10 0	13 0 0	
Battens.....	10 10 0	11 10 0	
Second white deals 3 in. by 11 in.	12 10 0	13 10 0	
,, ,, ,, 3 in. by 9 in.	11 0 0	12 10 0	
,, ,, ,, battens.....	9 10 0	10 10 0	
Pitch-pine: deals	16 0 0	18 0 0	
Under 2 in. thick extra	0 10 0	1 0 0	
Yellow Pine—First, regular sizes..	32 0 0	33 10 0	
Broads (12 in. and up).....	2 0 0	more.	
Oddments	22 0 0	24 0 0	
Seconds, regular sizes	24 10 0	26 10 0	
Yellow Pine Oddments	20 0 0	22 0 0	
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6	
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0	
Small ,, ,, ...	0 2 3	0 2 6	
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6	
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7	
¾ in. do. do.	0 0 7	- - -	
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11	
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0	
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0	
Teak, per load	16 0 0	20 0 0	
American Whitewood Planks— Per ft. cube.....	0 3 0	0 3 6	
Prepared Flooring—	Per square.		
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6	
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6	
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0	
6 in. at 6d. per square less than 7 in.			
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6	
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6	
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6	
6 in. at 6d. per square less than 7 in.			

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton.	
	£ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders ,, ,,	8 0 0	9 0 0
Angles, Tees and Channels, ordinary sections	8 2 6	9 2 6
Flitch Plates	8 10 0	0 0 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London.	
IRON—	£ s. d.	£ s. d.
Common Bars.....	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars.....	9 0 0	9 10 0

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
Schools	Kirkcaldy (N.B.) School Board	Not stated	Jan. 15
Art Schools	Hull Corporation	100*l.*, 60*l.*, 40*l.*	Jan. 31
*Plans for Rebuilding Institution	Liverpool Infirmary Committee	Four Premiums of 50*l.*	do.
*New Club House	Royal Norfolk & Suffolk Yacht C	25*l.*, 20*l.*, 15*l.*	No date
*New Buildings at Langho, near Blackburn	Chorlton, &c., Jt. Asylums Com	200*l.*, 150*l.* and 100*l.*	April 4

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c, Supplied by	Tenders to be delivered
Surveyor's Materials	Sheffield Corporation	A. L. C. Fell, Engineer, Town Hall, Sheffield	Jan. 7
Chapel, North Burton, Bridlington		S. Dyer, Architect, Quay-road, Bridlington	do.
Water Main (12¼ miles) Stannington	Tynemouth Corporation	J. Mansergh, Engineer, 5, Victoria-street, S.W.	do.
Pipe Laying (25 miles)	Manchester Corporation	G. H. Hill & Sons, Civil Engineers, Victoria-street, S.W.	do.
Road Works, South Norwood	Croydon Town Council	Borough Surveyor, Town Hall, Croydon	do.
Flags	Soothill Nether District Council	W. Scholefield, Wellington-road, Dewsbury	do.
Sewer, Hollybrook, Shirley	Southampton Corporation	R. R. Linthorne, Municipal Offices, Southampton	do.
Street Improvement Works, Duffryn-street	Mountain Ash (Glam.) R.D.C.	Surveyor, Mountain Ash	do.
Street Works, Spring-terrace, North Shields	Tynemouth Corporation	J. F. Smillie, Surveyor, Tynemouth	do.
Sewage Disposal Works, Pant	Wrexham R.D.C.	J. Price Evans, Engineer, Argyle Chambers, Wrexham	Jan. 8
Sanitary Pipes, Cement, &c.	Keighley Corporation	Borough Surveyor, Town Holl, Keighley	do.
Pavilion, Exeter		E. H. Harbottle & Son, Architects, Exeter	do.
Concrete Flagging (706 sq. yds.)	Leeds City Council	City Engineer, Municipal Buildings, Leeds	do.
Purifying Lime, Bushey	Watford Gas Company	Manager, Gas Company's Offices, Watford	do.
Pipes	Kirkcaldy (N.B.) Corporation	Kennedy & Jenkin, Engineers, 17, Victoria-street, S.W.	do.
Alterations to Bulkeley Arms Hotel, Menai Bridge	Amlwch Brewery Company, Ltd.	R. G. Thomas, Architect, Menai Bridge	do.
Additions to Gasworks	Wokingham Corporation	A. E. Sidford, Architect, Wokingham	do.
Road Works	Twickenham U.D.C.	F. W. Pearce, Surveyor, Town Hall, Twickenham	do.
Cricket Pavilion, Exeter		E. H. Harbottle & Son, Architects, Exeter	do
*New Cells and Cubicles, Alton Police Station	Southampton Corporation	County Surveyor, The Castle, Winchester	do.
*Rendering Baths Watertight & Reconstructing Drain	Hampstead Council	Borough Engineer, Town Hall, Hampstead	Jan. 9
Road Works, Bute-street	Cardiff Corporation	W. Harpur, Civil Engineer, Cardiff	do.
Cottage Homes, Aberdare	Merthyr Tydfil Guardians	T. Roderick, Architect, Aberdare	do.
Heating Works, St. John's Home	Ipswich Guardians	A. F. Villiamy, 19 Tower-street, Ipswich	do.
Chapel and School, Carleton, near Skipton		J. Hartley, Architect, Skipton	do.
Street Improvement Works	Castleford (Yorks) U.D.C.	W. Green, Surveyor, Castleford	do.
Steel Tramway Rails, &c.	Huddersfield Corporation	Borough Engineer, 1, Peel-street, Huddersfield	Jan. 10
Chilled Blocks (300 tons)	do.	do.	do.
Sewerage Works, Upholland Moor	Upholland (Lancs) U.D.C.	C. E. Senior, Surveyor, Council Offices, Upholland	do.
Waterworks, Winchburgh	Linlithgow District Committee	W. A. Tait, Engineer, 72A, George-street, Edinburgh	do.
Street Works, Gaskell-street, &c.	Runcorn R.D.C.	R. Garnett, Surveyor, 45, Sankey-street, Warrington	Jan. 11
Granite Setts	Leigh (Lancs) Corporation	T. Hunter, Borough Engineer, Leigh	do.
Additions to Schools, Westmoor, &c.	Long Benton School Board	Oliver & Co., Architects, Mosley-street, Newcastle-on-Tyne	do.
Sewers, Swinton, near Manchester		Surveyor, Council Offices, Swinton	do.
*Tar Paving and Gravelling, &c., Little Ealing	Metropolitan Asylums Board	Board's Offices, Embankment, E.C.	do.
Sewerage Works, Polsloe Priory	Heavitree (Devon) U.D.C.	F. E. Simpson, Surveyor, Council Offices, Heavitree	Jan. 13
Structural Steelwork, Buston	British Electric Traction Company	Engineer, 194, Wolverhampton-street, Dudley	do.
Sewerage Works, Station-road, Cullingworth	Bingley (Yorks) U.D.C.	H. Bottomley, Surveyor, Town Hall, Bingley	do.
Iron and Steel Substructures &c.	Burnham (Somerset) U.D.C.	W. J. Press, Surveyor, Council Offices, Burnham	do.
Corn Exchange, Woodbridge-road	Guildford Town Council	C. G. Mason, C.E., Borough Surveyor, Guildford	do.
*Making-up Russell-rd. Herbert-rd. &c., West Hendon	Hendon U.D.C.	S. Slater, Grimley Public Offices, Hendon, N.W.	do.
*Paving Materials	Metropolitan Borough of Stepney	M. W. Jameson, 15, Great Alie-street, Whitechapel, E.	do.
*Wheelwrights' and other Materials	do.	do.	do.
*Ballast, Sand, Shingle, Hoggin and Flints	do.	do.	do.
*Supplying and Fixing Hurdles, &c., at Camberwell	London County Council	Parks Department, 11, Regent-street, S.W.	do.
Cottage, &c., Clontail, Ireland	Ardee (No. 2) R.D.C.	L. Turley, C.E., 17, Laurence-street, Drogheda	Jan. 14
Retorts, Firebricks, &c.	Bury (Lancs) Corporation	H. Simmonds, Engineer, Gasworks, Elton, Bury	do.
*Erection 436 rods, Park, Pale and other Fencing	Metropolitan Asylums Board	Newman & Newman, 31, Tooley-street, S.E.	do.
Sheds	Derby Corporation	J. Ward, Borough Surveyor, Babington-lane, Derby	do.
Well Sinking	Armagh R.D.C.	W. Calvert, Workhouse, Armagh	do.
Fireclay Pipes, Setts, &c.	Lancaster Corporation	Borough Surveyor, Town Hall Lancaster	Jan. 15
*Taking-up and Relaying Flooring	Hackney Union	Guardians' Offices, Sidney-road, Homerton, N.E.	do.
*Sewage Works	Buckhurst Hill U.D.C.	R. Tooley, Architect, Buckhurst Hill	do.
Electricity Buildings, Castle-street	Barnstaple Town Council	A. Thorne, Borough Surveyor, Town Hall, Barnstaple	Jan. 16
*Additions, Drainage, Repairs, &c.	Greenwich Union	T. Dinwiddy, Architect, 12, Croom's Hill, Greenwich, S.E.	do.
Sewage Tank, Willenhall-road, Bloxwich	Walsall Corporation	Borough Surveyor, Bridge-street, Walsall	Jan. 18
Extension of Electricity Plant	Grimsby Corporation	W. A. Vignoles, Engineer, Grimsby	Jan. 20
Fireclay Goods	Nelson (Lancs) Corporation	A. J. Hope, Engineer, Gasworks, Nelson	do.
Street Works	Batley (Yorks) Town Council	O. J. Kirby, Borough Surveyor, Batley	do.
Extension of Electricity Works	Middlesbrough Corporation	R. Hammond, C.E., 64, Victoria-street, S.W.	Jan. 21
*Enlargement of Head Post Office, Norwich	Commissioners of H.M. Works, &c.	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	Jan. 23
Electricity Generating Plant	Barking (Essex) U.D.C.	E. H. Lister, Public Offices, Barking	Jan. 24
Public Baths, Lister Drive, West Derby	Liverpool Corporation	W. R. Court, Engineer, Municipal Offices, Liverpool	Jan. 27
Cottage Homes, Styal, Cheshire	Chorlton Guardians	J. B. Broadbent, Architect, 15, Cooper-street, Manchester	Jan. 30
Water Works	Paignton (Devon) U.D.C.	F. W. Vanstone, Engineer, Palace Chambers, Paignton	Jan. 31
Alterations to Premises, Jarratt-street	Kingston-upon-Hull Co-op. Soc.	T. B. Thompson, Architect, 15, Parliament-street, Hull	No date
House, West Bank, Lancaster		W. J. Taylor, Architect, Bank-street, Sheffield	do.
Bank House, Banchory, Aberdeen	Town and County Bank, Ltd.	R. G. Wilson, Architect, Aberdeen	do.
Church, Schools and House, Amble		T. E. Davidson, Architect, 14, Neville-street, Newcastle	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Longtown R.D.C.	Not stated	Jan. 13
*Assistant Surveyor	Hindley U.D.C.	Not stated	do.
*Manual Training Instructors & Assistant Instructors	School Board for London	100*l.* to 155*l.*, and 80*l.* to 100*l.*	No date

Those marked (with an asterisk) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x & xxxii. Public Appointments, pp. xxix & xxxii.

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PRICES CURRENT (*Continued*).

METALS.

IRON—	Per ton, in London.		
Hoop Iron, basis price	9	5	0
,, ,, galvanised	16	0	0
(* And upwards, according to size and gauge.)			
Sheet Iron, Black.—			
Ordinary sizes to 20 g.	10	0	0
,, ,, to 24 g.	11	0	0
,, ,, to 26 g.	12	10	0
Sheet Iron, Galvanised, flat, ordinary quality.—			
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12	10	0
,, ,, 22 g. and 24 g.	13	0	0
,, ,, 26 g.	14	0	0
Sheet Iron, Galvanised, flat, best quality :—			
Ordinary sizes to 20 g.	16	10	0
,, ,, 22 g. and 24 g.	17	0	0
,, ,, 26 g.	18	10	0
Galvanised Corrugated Sheets.—			
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12	10	0
,, ,, 22 g. and 24 g.	13	0	0
,, ,, 26 g.	14	0	0
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12	5	0
,, ,, 22 g. and 24 g.	13	5	0
,, ,, 26 g.	14	5	0
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9	10	0

		Per ton, in London.					
		£	s.	d.	£	s.	d.
LEAD, &c.							
LEAD—Sheet, English, 3 lbs. & up.		13	5	0	-	-	-
Pipe in coils		13	15	0	-	-	-
Soil Pipe		16	5	0	-	-	-
ZINC—Sheet—							
Vieille Montagne	ton	24	10	0	-	-	-
Silesian		24	0	0	-	-	-
COPPER—							
Strong Sheet	per lb.	0	1	0	-	-	-
Thin	,,	0	1	1¼	-	-	-
Copper nails	,,	0	1	1½	-	-	-
BRASS—							
Strong Sheet	,,	0	0	11	-	-	-
Thin	,,	0	1	1	-	-	-
TIN—English Ingots	,,	0	1	3	-	-	-
SOLDER—Plumbers'	,,	0	0	6½	-	-	-
Tinmen's	,,	0	0	8	-	-	-
Blowpipe	,,	0	0	9	-	-	-

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3½d. ,, ,,
,, fourths	3¼d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, fourths	4¼d. ,, ,,
32 oz. thirds	5¼d. ,, ,,
,, fourths	5¼d. ,, ,,
Fluted sheet, 15 oz.	3¼d. ,, ,,
,, 21 ,,	4¼d. ,, ,,
½ Hartley's Rolled Plate	2¾d. ,, ,,
⅜ ,, ,, ,,	3¼d. ,, ,,
½ ,, ,, ,,	3¾d. ,, ,,

OILS, &c.		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	2	10
,, ,, ,, in barrels	,,	0	2	11
,, ,, ,, in drums	,,	0	3	1
Boiled ,, ,, in pipes	,,	0	3	0
,, ,, ,, in barrels	,,	0	3	1
,, ,, ,, in drums	,,	0	3	3
Turpentine, in barrels	,,	0	2	3
,, in drums	,,	0	2	6
Genuine Ground English White Lead	per ton	21	10	0
Red Lead, Dry	,,	21	10	0
Best Linseed Oil Putty	per cwt.	0	8	6
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Elastic Copal Varnish for outside work	0	16	6
Best Elastic Copal Varnish for outside work	1	0	0
Best Elastic Carriage Varnish for outside work	0	16	0
Best Hard Oak Varnish for inside work	0	10	6
Best Extra Hard Church Oak Varnish for inside work	0	10	6
Fine Hard Copal Varnish for inside work	0	16	0
Best Hard Copal Varnish for inside work	1	0	0
Best Hard Carriage Varnish for inside work	0	16	0
Extra Pale Paper Varnish	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
Best French and Brush Polish	0	12	0

TO CORRESPONDENTS.

H. S.—W. de N.—M. H.—J.B.—(Amounts should have been stated.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under *too*l., unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABERDEEN.—For the erection of a car-shed, Mannofield, for the Town Council. Mr. Wm. Dyack, Burgh Surveyor, Town House, Aberdeen :—

Masonry.—Beattie & Sons, Holland-street	£538 9
Plastering.—Sellar & Co., John-street	75 18
Slating.—Adam & Co., Hutcheon-street	38 10
Plumbing.—Jas. Brown, Great Western-road	49 7

ASKAM-IN-FURNESS.—For the erection of schools, for Primitive Methodist Church. Mr. W. Richardson, surveyor :—

Brickwork, &c.—G. Martin, Dalton	£262 0 0
Joinery, &c.—I. Burrows, Dalton	158 17 6
Painting, Heating, &c.—J. W. Lawn, Dalton	74 15 6
	493 13 0

AXMINSTER.—For erecting the Devon and Cornwall new bank premises. Mr. Ernest A. Pryer, architect, Dunheved-chambers, Axminster, and Lyme Regis :—

C. Turner	£2,250	Stephens & Sons, Ld.	£1,832
J. W. & H. Childs	2,157	Cloud & Newbery	1,843
Bartlett & Sons	2,015	Parsons & Clarke, Axminster*	1,820
Woodman & Son	1,952		
J. G. Sprackling	1,885		

BLACKBURN.—For extensions to Norfolk-street (C.E.) schools, Mill-hill, for the Building Committee. Messrs. Stones & Stones, architects, 10, Richmond-terrace, Blackburn. Quantities by the architects :—

James Charnley, Mill-hill, Blackburn £1,256

BRIDLINGTON.—For the erection of a villa, Flamborough-road, for Mr. J. Buckley. Mr. A. R. Buckley, architect, Belgrave-square, South Cliff, Bridlington Quay :—

Bricklaying and Plastering.—J. Sawdon*	£365 0
Joinery.—Storr & Son*	344 0
Stone work.—T. Booth*	11 10
Tiling and Slating—W. Dodgson*	74 7
Plumbing.—E. S. A. Smith*	150 0
Painting.—E. Dunn*	37 0

[All of Bridlington.]

BRIDLINGTON.—For additions to Marine House, Promenade, for Dr. Wetwan. Mr. S. Dyer, architect, Bridlington :—

E. Corner	£457 0	T. Spink	£418 0
F. Kneeshaw	452 9	W. Barnes	416 0
A. A. Booth	424 18	J. Rennard	332 17
R. Musk	422 5	J. H. Hudson, Princess-street*	326 17

[All of Bridlington.]

BROADSTAIRS.—For the erection of a house, North Foreland Estate. Mr. W. H. Woodroffe, architect, Town Hall Chambers, 32, High-street, Southwark, S.E. :—

Paramor	£3,010	Padget & Son	£2,660
Stiff	3,000	Wise	2,478
Tilbury	3,000	Gann	2,445
Martin	2,799	Wing	2,437
Denne & Co.	2,690	Turner, Walmer†	2,370

CARDIFF.—For the erection of a public convenience Roath, for the Corporation. Mr. W. Harpur, C.E. Town Hall, Cardiff. Quantities by Engineer :—

Allan & Sons	£326 12 4	Knox & Wells	£260 0 0
J. E. Evans	291 14 9	W. T. Morgan	258 15 0
D. W. Davies	291 10 0	F. J. Robbins *	253 13 6
F. Small	269 14 1	[All of Cardiff.]	

CHERRYHINTON (near Cambridge).—For the execution of sewerage works for the Chesterton Rural District Council. Messrs. Waters & Worrall, engineers, 2, Sidney-street, Cambridge. Messrs Beesley, Son & Nichols, consulting engineers, Westminster, S.W. :—

Swann Bros.	£16,311 9 8!	Cutler, Hayward & Co.	£10,292 0 0
Binn Bros.	13,467 3 7	Rayner	10,215 0 0
Banyard	12,990 0 0	Bloomfield	10,125 0 0
Cookes & Co.	12,183 0 0	Wilkinson	10,055 0 0
Jackson	11,962 12 0	Bentham & Co.	9,987 0 0
Underwood Bros.	11,897 0 0	Lock & Andrews	9,615 4 6
Bell	11,198 0 0	Johnson & Langley	9,527 0 0
Manders	11,087 0 0	Jones & Sons, Poole*	9,233 7 5!
Johnson Bros.	10,700 0 0		
Burgoyne & Sons*	10,622 17 0		

CHISLEDON (Wilts).—For the erection of three cottages, Draycot Farm, near Swindon, Wilts, for Colonel T. C. P. Calley. Mr. R. L. Beswick, architect, 35, Regent-street, Swindon :—

J. Williams	£740 0	C. Hunt	£555 0
R. J. Leighfield	590 0	W. Warren, Chisledon, nr. Swindon*	545 0
S. Chambers	586 5	W. Cowdrey	505 0
A. J. Colborne	579 10		

HASTINGS.—For the construction of a lift station and conveniences, East Hill, for the Corporation. Mr. P. H. Palmer, C.E., Town Hall, Hastings :—

W. F. Ditch, Hastings* £655

HULL.—For the erection of pavilions, &c., for the Infirmary Board. Messrs. T. Worthington & Son, architects, 46, Brown-street, Manchester. Quantities by Mr. John Watson, surveyor, Hull :—

Armitage & Hodgson	£26,870 15 8	Blackburn & Son	£24,523 0 9
A. Lyons	26,839 0 0	Good & Sons, Ltd.	24,106 4 11
Executors T. Southern	26,152 0 5	M. Harper	23,588 0 9
G. Houlton	25,118 0 0	I. T. Levitt	23,505 19 1
Bowman & Sons	24,708 0 0	F. Beilby, Hull*	23,047 12 1
T. Goates	24,568 0 0		

LONDON.—For alterations at the "Earl of Warwick" public-house, Stoke Newington, N. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, London, E.C. :—

Dearing & Son	£976	Green & Smith	£820
Goodall & Son	883	Sheffield Bros.*	760
Chapman & Co.	863		

LONDON.—For repairs to shop premises, Finsbury pavement, London, E.C. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, London, E.C. :—

Cooke & Co.	£275 12	J. Jefford	£194 0
A. Major	205 0	Osborn & Sons*	180 0

LUTON.—For residence, the Drive, Hart Hill, for Mr. B. Laporte. Mr. A. Wilkinson, architect, Inkerman-street :—

T. & E. Neville	£1,345	G. Angel	£1,120
G. W. Pryer	1,265	Mallet & Wood	1,049
G. Kingham	1,140	Alfred Mardle*	1,948
[All of Luton.]			

NEWLYN (Cornwall).—For the erection of two houses and shop, Bucka's-pass, for Mr. R. Batten. Mr. Henry Maddern, architect, 26, Clarence-street, Penzance :—

John Lavers	£356 10	Jas. & John White	£392 6
John S. Tregenza	353 10	James Rowe	345 0
Thos. James	353 10	Joseph H. Nicholas, Penzance*	285 11

OSWESTRY.—For the erection of business premises Leg-street and Albion Hill. Mr. W. H. Spaull, architect The Gables, Oswestry :—

Wm. Felton	£1,785 0 0	Jones & Evans, Oswestry*	£1,614 0 0
W. H. Thomas	1,648 10 6		
J. Higgings	1,620 0 0		

OSWESTRY. — For erecting Freemasons' Hall, Oswestry. Mr. W. H. Spaull, architect, The Gables, Oswestry :—

W. Bowdler	£2,207 0	Jones & Evans	£1,798 10
W. H. Thomas	1,845 0	Griffiths & Son, Ellesmere*	1,750 0
W. Felton	1,820 10		

PLUMPTON (Sussex).—For alterations, &c., to house and premises, Sedgebrook, for the Cuckfield Rural District Council. Mr. A. R. Pannett, architect, Hayward's Heath :—

J. Whiting	£578 0 0	W. Wells, Plumpton*	£510 0 0
W. A. Small	541 2 3		
F. Agate	536 2 0		

ROTHERHAM.—For additions to National Schools, Braithwell, for the Managers. Mr. E. T. Hubbard, architect, Moorgate-street, Rotherham :—

Chas. Green & Co., Wellgate, Rotherham .. £260

SOUTHEND-ON-SEA.—For the erection of two shops, Heygate-avenue. Messrs. Greenhalgh & Brockbank, architects, Bank Chambers, Southend. Quantities by the architects :—

Baker & Wiseman	£1,793 0	Harris & Rowe	£1,460 0
E. West	1,695 0	W. E. Dawey	1,442 10
Golding	1,658 0	W. Stubbs	1,382 7
Ardley & Elvey	1,584 0	J. Band, South-end†	1,360 0
Moss	1,512 0		
Shelbourne & Co.	1,492 0		

SOUTH NORWOOD.—For taking down St. Thomas's temporary iron church, Telford-avenue, Streatham Hill, and re-erecting with alterations as parish-room in the rear Holy Innocents Church, South Norwood. Mr. Money Marsland, surveyor, 68, Gt. Tower-street, E.C. :—

Mitson & Co.	£554 10	E. Crossley†	£497 0
Lightfoot & Ireland	512 0		

SWINDON.—For alterations to Nos. 31, 32, 33, and 34, Fleet-street, Swindon, for Mrs. M. E. Storer. Mr. Robert J. Beswick, architect :—

S. Chambers, Swindon* £370 12 6

TORQUAY.—For the erection of the Mallock memorial clock tower. Mr. J. Donkin, architect, Bournemouth :—

W. A. Goss	£1,293 0 0	A. R. Webber	£988 10 6
R. F. Yeo	1,200 0 0	Jenkins & Sons	964 10 0
Parker & Sons	1,030 0 0	E. P. Bovey	320 0 0
E. Pike	999 7 0	H. C. Jackman	830 0 0

WALTHAMSTOW.—For the erection and completion of Sunday schools for the Trustees of the United Methodist Free Church. Mr. J. Williams Dunford, architect, 1occ Queen Victoria-street, E.C. :—

W. Shurmur	£3,856	F. J. Coxhead	£3,697
S. J. Scott	3,799	Sands, Palmer, & Co.	3,690
J. Reed	3,740		

WANSTEAD (Essex).—For the erection of a building at the cottage hospital for the Urban District Council. Mr. C. H. Bressey, Surveyor, Council Offices, Wanstead :—

Priest & Son	£346 0 0	J. B. Hutchins	£295 0 0
A. Reed	342 0 0	W. Mundy	276 0 0
J. Jolliffe	330 0 0	W. A. Robins	258 0 0
Osborn & Sons	324 0 0	T. J. Hawkins	255 0 0
Rolfe & Co.	308 0 0	G. P. Baubury	243 11 3
F. L. Willmott	300 0 0	G. Ginger, jun., Manchester*	229 0 0
Sands, Palmer, & Co.	298 10 0	Thompson & Co.	216 8 6
Mitson & Harrison	295 10 6		

[See also next page.

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WARE.—For the construction of sewer, Viaduct-road, and siphon under river Lee, for Ware Urban District Council. Mr. J. Elliott Smales, Surveyor :—

S. Ketteringham	£483 0 9	R. W. Swaker, Hounslow*	£400 0 0
A. C. Soan	411 6 0		

WARE (Herts).—For the execution of road improvement works, Amwell End. Mr. J. E. Smales, Surveyor, New-road, Ware :—

Wallace & Inns.	£817 13 2	M. S. Kettering-ham	£685 4 6
A. C. Soan	781 15 6	G. Porter	671 15 1
Collis & Co.	695 4 7	S. Hipwell	658 9 10
C. C. Smith	690 13 10	A. T. Catley, Lloyd-square, W.C.*	637 0 0
Felkin & Watson	689 12 6		
W. H. Wheeler	686 0 6		

WESTCLIFF.—For the erection of a pair of houses, Westcliff-on-Sea, Essex. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, London, E.C. Quantities supplied :—

Courtney & Fairbairn	£2,325 0	Dupont & Co.	£2,085 0
Baker & Wiseman	2,155 0	A. Ducat*	1,898 10

WILLESDEN.—For the erection of main station, Electricity Works, Taylor's-lane, for the Willesden District Council. Mr. O. Claude Robson, Engineer :—

S. W. Moscrip	£38,487	J. & M. Patrick	£32,199
Foster Bros.	36,880	C. G. Hill	31,897
Patman & Fotheringham	36,701	M. G. Minter	31,890
Smith & Sons	35,824	Johnson & Son	31,250
Godson & Sons	35,150	Wilkinson Bros.	30,900
Allen & Sons	34,500	B. E. Nightingale	30,219
Martin Wells & Co.	32,942	Pattinson & Son*	29,933

WILLESDEN.—For the erection of sub-station, Electricity Works, Salusbury-road, for Willesden District Council. Mr. O. Claude Robson, Engineer :—

S. W. Moscrip	£15,018	F. G. Minter	£13,257
J. & M. Patrick	14,920	Martin Wells & Co.	13,126
Godson & Sons	14,100	G. Neal	13,118
Patman & Fotheringham	14,100	Pattinson & Son	12,943
Smith & Sons	14,031	Johnson & Son	12,875
G. G. Hill	13,529	B. E. Nightingale	12,290
Simpson & Sons	13,373	Braid, Pater, & Co.*	11,300
Allen & Sons	13,365		
Foster Bros.	13,280		

WILLESDEN.—For alterations and additions to the Isolation Hospital, for the Willesden District Council. Mr. O. Claude Robson, Engineer :—

Godson & Sons	£30,474 0 0	Johnson & Son	£26,620 0 0
S. W. Moscrip	30,427 11 4	Sabey & Son	26,615 0 0
Simpson & Son	28,761 0 0	Nightingale	26,212 0 0
H. Martin	27,272 0 0	Gibb & Co.*	25,815 0 0
C. Brightman	27,200 0 0		

WOKING.—For the formation and sewering of Ashwood-road and remainder of Heathfield-road, for the Suburban Building Land Co., Ltd. Messrs. Pooley & Follett, architects and surveyors, 21, John-street, Adelphi, W.C. :—

	New roads.	Sewers.	Totals.
Thomas Adams	£1,656 0 0	£380 0 0	£2,036 0 0
W. Lasgridge	1,511 17 1	359 12 9	1,871 9 10
Chafen & Newman	1,442 7 10	338 8 2	1,780 16 0
G. A. Franks	1,395 0 0	338 0 0	1,733 0 0
Drowley & Co.	1,376 0 0	336 0 0	1,712 0 0
Bentham & Co.	1,413 0 0	281 0 0	1,694 0 0
S. Kavanagh, Surbiton Hill*	1,366 8 3	308 4 0	1,674 12 3

WILLESDEN.—For the erection of chimney-shaft, Electricity Works, Taylor's-lane, for Willesden District Council. Mr. O. Claude Robson, Engineer :—

Neil & Co.	£8,324	Martin Wells & Co.	£5,984
Wilson Bros. & Co.	7,979	B. E. Nightingale	5,945
Myles & Warner	7,285	Pattinson & Son	5,743
Foster Bros.	7,280	Wilkinson Bros.	5,700
S. W. Moscrip	6,637	Allen & Sons	5,635
Storrs, Son, & Co.	6,569	C. G. Hill	5,597
Smith & Sons	6,132	Godson & Sons	5,502
J. & M. Patrick	6,099	F. G. Minter	5,390
Patman & Fotheringham	6,085	Johnson & Son*	5,364

WOLVERHAMPTON.—For additions, &c., to Townhall, for the Corporation. Mr. Fred. T. Beck, architect, Darlington-street, Wolverhampton. Quantities by Messrs. Vale & Kingsford :—

W. Hopkins	£17,050	Merton Hughes	£15,520
G. Cave & Son	16,500	James Herbert	15,159
H. Gough	16,200	Willcock & Co., Wolverhampton*	14,550
Lindsay Jones	15,700		

For Panelling, &c., in Council Chamber and Mayor's Reception Room.

Willcock & Co.* £1,375

WOOLWICH.—For the erection of wall at the union grounds, Plumstead, for the Union Guardians. Mr. J. O. Cook, architect, 12, Eleanor-road, Woolwich. Quantities by Mr. C. W. Brooks, 63, Finsbury-pavement :—

Stephens & Son	£1,200	Thomas & Edge, Woolwich*	£871
E. Proctor	1,057	Lanford & Co.	710
J. W. Hart	974		
Herbert Bros.	890		

A CORRECTION IN TENDERS.—Messrs. Palgrave & Co. write :—"Referring to your list of tenders in your issue of the 21st ult., for the erection of D'Eresby House, Ealing Common, W., we notice a clerical error in Messrs. Barker & Co.'s estimate, which should be 20,342*l.* in lieu of 26,342*l.*, and in justice to them we should be glad if you would notify same. Owing to the Christmas holidays it was unnoticed before."

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VOL. LXXXII.—No. 3075. JANUARY 11, 1902.

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The New Town Hall at Marlborough ..... Mr. C. E. Ponting, F.S.A., Architect.
A Town Hall for a London Borough ..... Design by Mr. F. W. Newman.
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The Germans at Baalbek.

"The ruins of Baalbec, invisible to the writers of antiquity, excite the curiosity and wonder of the European traveller. I am much better satisfied with Maundrell's slight octavo than with the pompous folio of Doctor Pocock, but every preceding account is eclipsed by the magnificent description and drawings of MM. Dawkins and Wood, who have transported into England the ruins of Palmyra and Baalbec.

The measure of the temple is 200 ft. in length, and 100 ft. in breadth; the front is adorned with a double portico of eight columns; fourteen may be counted on either side, and each column, 45 ft. in height, is composed of three massive blocks of stone or marble. The proportions and ornaments of the Corinthian order express the architecture of the Greeks; but as Baalbec has never been the seat of a monarch we are at a loss to conceive how the expense of these magnificent structures could be supplied by private or municipal liberality. The Orientals explain the prodigy by a never-failing expedient. The edifices of Baalbec were constructed by the fairies or genii. With less absurdity, but with equal ignorance, Abulfeda and Ibu Chankel ascribe them to the Sabæans. 'Non sunt in omni Syriâ ædificia magnificentiora tris' (*Tabula Syriæ*)."—*Gibbon: Cap. LI.*: "The Arab Conquest of Syria."

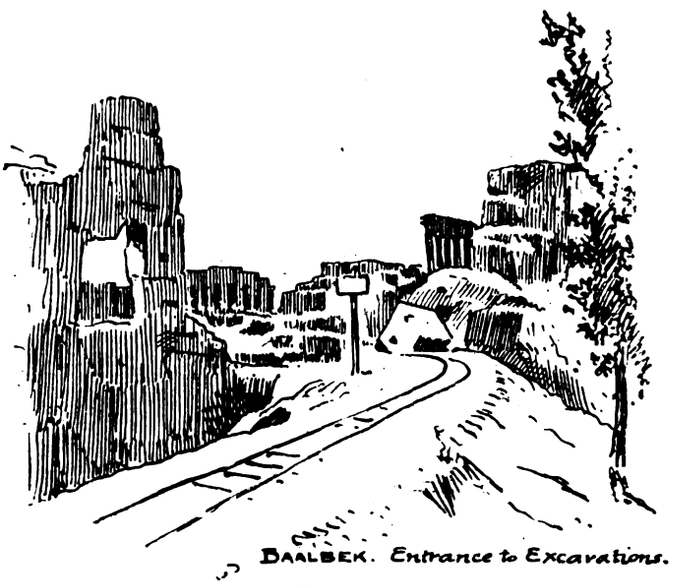

Fig. 1.

THE "unearthing" of the ruins of Baalbek, which the German Government is at present engaged upon, promises to be an important and imposing addition to the series of ancient sites which have been opened up in the Levant during the past half century. The excavations are on the scale of those at Olympia, and the enormous mounds of earth which are slowly accumulating on the north side of the ruins (fig. 1) impress the beholder with the magnitude and thoroughness of the work, and of the vast sums which are being expended upon it.

The following observations on the progress of the work, made on a casual visit, are in anticipation of the exhaustive and voluminous work which will doubtless be published by the authorities in Berlin before very long. As is usual with Germans, the directors of the work at Baalbek meet all inquiries or outside efforts at investigation with suspicion and opposition, but in spite of this dog-in-the-manger spirit the following facts have been gleaned as to the actual discoveries of the last few months.

In the first place the plans of the group of buildings in the Classic period, and in the early Christian and Mediæval Arab times, can now be intelligibly studied. Of the more ancient or prehistoric epoch, before the coming of the Romans, there seem but few traces, but still the centre feature of the whole site, its *raison d'être*, in fact, is of this earlier period and of singular interest as such. This central feature is the rock-hewn altar platform round which the Roman buildings have been planned as an ornamental enclosure.

Referring to the accompanying plan (fig. 2), it will be noticed that the centre of the whole group of buildings is a rock which, in a primitive age, must have risen to a trifling height above the plain or flat level of the valley of Cœlesyria. This rock seems to have been sculptured into one of the not uncommon altar platforms of the prehistoric style. It would probably be one of those altars used for human sacrifice, and at one side are still preserved the rock-hewn steps up which the victims would be led for the purpose (fig. 3). Similar examples of such rock-cut altars occur elsewhere in Palestine and Syria. Previous to the coming of the Romans the rock would probably have retained its natural form, the site being sufficiently conspicuous for the purpose of an open-air assemblage, and the open ground around affording an excellent expanse for the purpose. This rock-hewn altar platform was probably hollow, with a natural cavity like the larger example on Mount Moria, Jerusalem, but this has been a good deal broken through at one side. Inequalities in its squareness of form have been rectified by adding blocks of masonry, which in after times, when the destruction of the monument was contemplated, have been overturned and left abandoned.

The Emperor Caracalla is credited with introducing the Roman architecture on the site, which astonishes if it does not charm the beholder at the present day. But such monuments would require many years for completion, and indeed a great part of the

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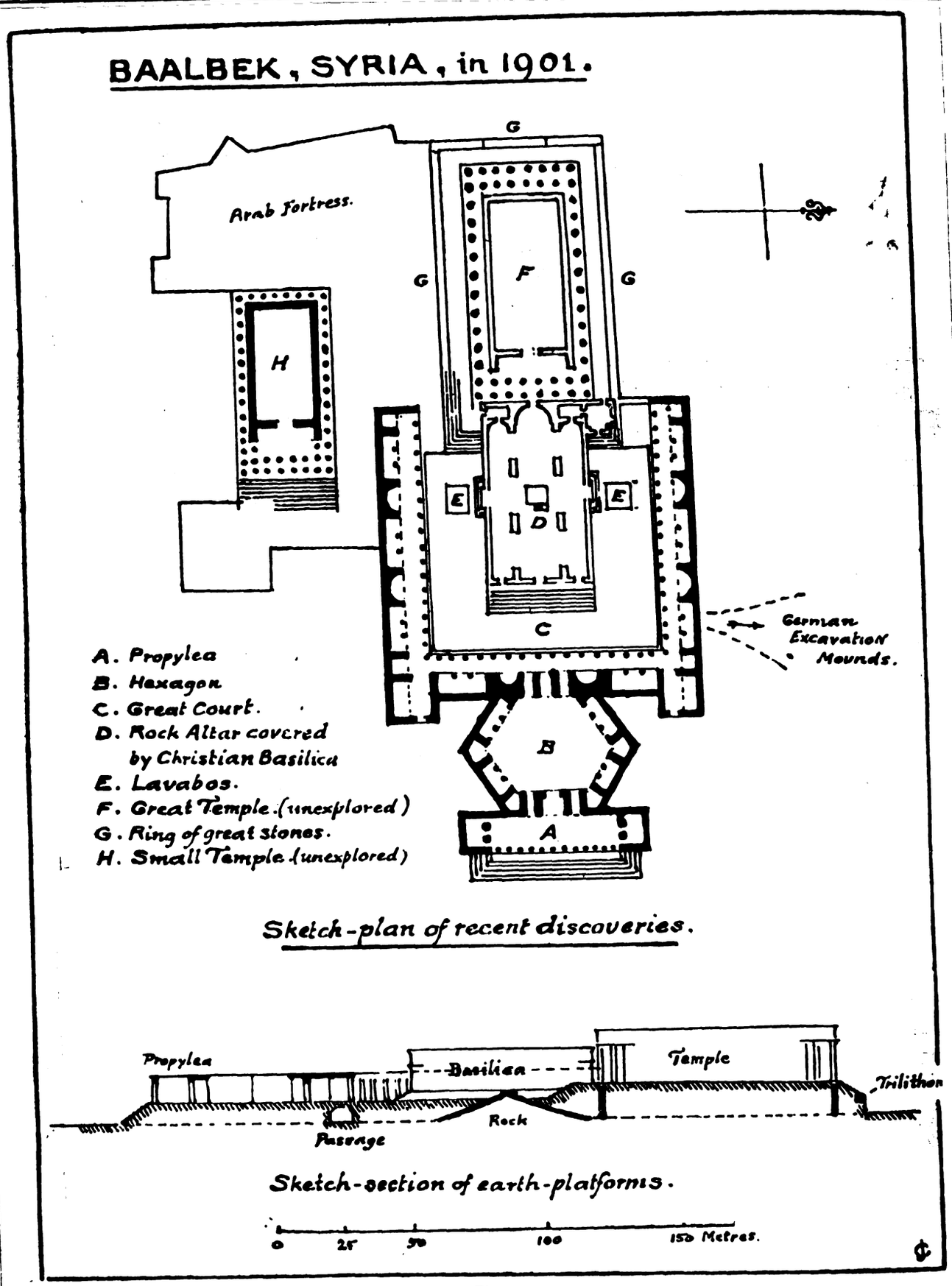

Fig. 2.

buildings bear evidence of never having been completed. In the days of Theodosius, nearly a century later, the work of building the exedræ and outer portions of the group of temples was still going on.

We know so exceedingly little of the religious rites and ceremonies of the ancients and of the systems preceding Christianity that little can be defined as to the destination and use of the different parts of this great monument at Baalbek. The Romans presumably found the rock altar shrine of Baal (or the Sun) in the condition in which it still exists. They surrounded it on all sides by a series of walls making up a terrace or platform level with the base of the altar in a way which was commonly used in fortification. On the east, north, and south sides these walls constituted passages and chambers under the general level of the platform, and on the west side the great temple filled up the space on a huge artificial mound of earth. The basement or lower story of the platform is built of huge blocks of limestone which have never been squared on the face, but only at the jointings. The same system of leaving the masonry to be brought down to a general surface after placing in position has been adopted all over the buildings, sometimes with a finished surface partly completed but with the edges left raised so as to avoid injury to the jointings in the

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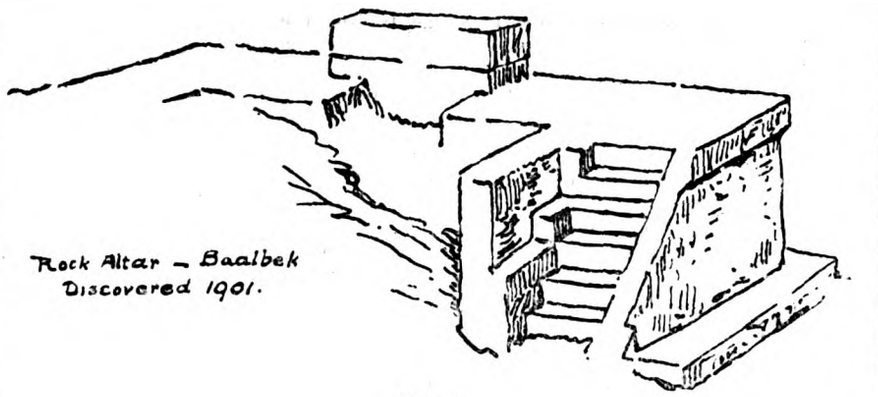

Fig. 3.

process of handling. These raised edges were intended to be removed at the completion of the work.

On the walls of the substructure surrounding the great court of the rock-hewn altar, was raised the singular colonnaded ambulatory with its square and semi-circular chambers. This magnificent colonnade is one of the features of the ancient design which has just been brought to light. The object of this peculiar arrangement of chambers surrounding the great atrium is not very apparent. On each side of the great altar was a lavabo, or shallow basin of water, formed by a low wall, with sculptured panels on the outside filled with winged genii, &c., and festoons of flowers. In some cases this decoration has been left unfinished; evidently these water-basins were among the latest additions to the monument.

The existing superstructures of the great platform are too well known to need description; but the splendid colonnade which once closed them in had hitherto escaped notice, none of the columns being *en évidence*. It stood on three steps leading down into the great atrium, and probably resembled the design of the three-sided colonnade of the basilica of Constantine at Jerusalem, with which it was almost contemporary.

On the west side of the great atrium stood the famous Roman temple of the Sun, once one of the largest in the world, but now reduced to the insignificant proportions of merely six columns. The Germans have made but slight progress in exploring the heap of earth which still covers up its basement, but sufficient is already laid bare to explain its construction and to account for its ruin. In designing this stupendous building the Roman engineers adopted a system of construction of great originality, but wanting in those elements of stability which we usually associate with the Roman name. On the west side of the great prehistoric altar there had originally been nothing, and here the Romans created a large artificial mound of earth on which to raise their great temple with its floor somewhat above the level of the altar atrium. The atrium was surrounded on three of its sides by a continuous colonnade, and on the fourth the space was occupied by the columns of the temple façade, and the steps leading up to the higher level. The origin and purpose of the famous great stones—the trilithon—which have been the wonder of all ages, are now explained. The great artificial platform of the temple was surrounded on three of its sides with a continuous ring of these enormous stones (60 ft. long) for the purpose of steadying the mound of earth, placed at a distance of about 20 ft. from the substructure supporting the great colonnade, and forming at the same time the lower course of steps of the platform. The three great stones on the west side of the platform have always been exposed to view, those on the south side have only just been discovered and are at present being laid bare. On the other sides of the temple the level of these stones is still covered up with earth and débris, and masked by the Arab fortifications of the Middle Ages. Carrying on to some extent the same idea of construction in all the buildings, the temple and its atrium become the upper story raised about 50 ft. above the original ground or rock level. The lower story consists of long vaults and, in some cases, vaulted apartments, but the chambers which probably exist under the great temple have not yet been found.

The present excavations are not extended much beyond the great atrium, and the result of them is wonderfully interesting and complete. The spectator is able to realise at a glance the original appearance of the monument, whereas before the Germans commenced operations all was chaotic and unintelligible ruin. The destruction of the surrounding colonnade is, unfortunately, complete, but the paving of the great court, the lavabos, &c., seem not to have been at all disturbed.

The original design and destination of the stupendous monument of Baalbek must always be its chief interest, and for the purpose of investigating Classical religious ideas and usages, of which we know really very little, the present exploration will prove of exceptional value. At the same time the subsequent history of the ruins is also of intense interest.

The Classical temple was one of the last to be closed by the edicts of Theodosius, and apparently the army of building operatives which was employed upon it until the very last was provided with work of a new type immediately upon the change of religion. In the centre of the great atrium stand the remains of one of the earliest of the Christian basilicas of the fourth or fifth centuries, North Syrian style. This basilica, perhaps following a local characteristic, is also built on a raised platform of earth, but the earth has been raised in this position for the purpose of covering up the constructions of the Classic period. The early Christians evidently thought to convert the old site to their use, but did not dare to destroy it altogether, so they allowed the rock-hewn altar to remain where it has just been discovered, buried in the centre and under the floor of the new basilica. The three apses of the new basilica were built on the steps of the east front of the temple, and the baptistery seems to have been formed out of an "exedra" or chamber at the same end of the building. The altar of the Christians was, of course, to the west, and the building was covered with wooden roofs supported on nave arcades of phenomenal span.

The ancient enceinte of Baalbek was turned into a regular fortified town during the Byzantine period; a main street lined with dwelling-houses leads down the south side of the great temple, but many of these remains will, of course, be destroyed by the German excavations. The Arab constructions of a still later age will absolutely disappear as the work progresses. Such a fate is, perhaps, inevitable, although much to be regretted. The amount of interesting information which has already been gained upon the subject of the older religion and its monuments must be a compensation for the loss of later history and Arab associations.

As an example of ancient engineering, the method of constructing the great temple is perhaps unique. Its ruin is, however, not so much to be attributed to faulty design—although it was hardly fitted to a country subject to earthquakes—as to the usual destructiveness of the barbarians, who have endeavoured to extract the metal dowells from between the stones. Indeed, considering the way in which the remaining six columns still stand on their precarious bases, with their much injured joints, it would seem as if the human influences for destruction were the chief ones in the case. It is to be hoped efficient means may be taken to prevent the crashing down of these remaining six columns, and it is evident that such means must be adopted before any exploration can take place within the actual area of the temple and its cellar.

In Byzantine times, when the greatest amount of damage was probably done to the site, the earth from the great temple platform was probably removed to a great extent for the purpose of filling up the area round the rock-cut altar. This denudation of the building probably caused a great deal of ruin, and it is this earth which the Germans are now carting away.

OLD MASTERS AT BURLINGTON HOUSE.

THIS is a Claude year at Burlington House, Gallery II. being entirely occupied by twenty-four landscapes of the French master, while some other important examples are distributed in other rooms. It is therefore an occasion to consider seriously what one thinks of Claude.

As our readers are aware, we are not of those who are prepared "jurare in verba magistri" where Ruskin is concerned; but it cannot be denied that Ruskin did a service to modern art-criticism in telling his generation that they ought to revise their opinion of Claude; though, as usual, he drove his opinions home by great and unfair exaggeration, and by unnecessary comparisons with Turner which prove nothing, except that Claude was not Turner. But Claude had been so long accepted by the general public as a name to swear by—ac-

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cepted with so little thought as to what are the real possibilities of landscape-painting, that perhaps only a little rough speaking would have availed to put an end to this popular idolatry.

A good deal of what Ruskin said about Claude was true. His seas are tame, crude, and mechanical; his trees are conventional, and represent no special form of tree, only an idealised tree which suits the composition; a charge which, however, may be equally made against Gaspar Poussin, Salvator, Gainsborough, and many other landscape-painters of the seventeenth and eighteenth centuries; and may even be applied to Corot among the moderns. The conscientious study of trees in their natural variety of foliage and effect is an achievement of modern art; in earlier days a tree was an object serviceable in landscape composition; if it took its place in this it was sufficient that it was a tree; *i.e.*, a growth with branches and foliage; and we have no right to expect more of Claude. His generation looked not for nature in landscape, but for poetic compositions founded on nature; and he, better than most others of his day, gave them what they wanted.

Claude's weakness consists not only in this conventionalism of trees and sea, but in his narrow range of subjects and effects. As we are forcibly reminded in Gallery II., he had practically only two subjects and one effect; the materials are always the same; the arrangement of them, the composition, alone is varied; and even in this respect there is a good deal of repetition of the same formula. There are two Claude pictures, seaport scenes and inland scenes, each of which is repeated over and over again, not however *ad nauseam*—they are too pleasing and (in their way) too poetic for that proverbial expression to be suitable.

It is difficult to realise exactly how far their present appearance coincides with their effect when new. The distance effects were probably very delicate, in many cases, even could we see the painting fresh from the easel; but there seems little doubt that in some cases this delicate and ethereal effect has been enhanced by age. In "La Récompense du Village" (48), for instance, lent by the Earl of Yarborough, the distant hills are almost dreamlike in their faint suggestion, but they look rather as if they had faded into this hazy consistency. What about the figures in the foreground of this picture? They are very carefully painted and highly finished, but are they Claude's? It is known that in some cases the figures in Claude's landscapes were put in by other hands; this looks rather like an instance of it. The Marquis of Lansdowne's small picture, "A Seaport" (47), is one of the best of the seaport scenes; there is a beautiful quiet light about it; the reflection of the sun in the water (not properly vertical to the source of light) looks rather tricky, but in the main this is a good example of its class. Captain Dawson's small landscape (49), with a road and a bridge in the foreground, is admirable in composition but unlike most of the others in colour; it may however be a genuine Claude. The finest picture in the room is undoubtedly Lady Wantage's "The Enchanted Castle" (67), a large work with the castle massed in the centre (an effect imitated occasionally by Turner), and the distance going off on the right in a beautiful gradation of tints. This is a work which sums up all the best qualities of Claude's art. The same delicate treatment of successive planes of distance is seen in Lord Northbrook's "Shepherd and Shepherdess" (56). Among the other works Sir F. Cook's contribution (69) is an exceptionally good composition; Lord Northbrook's "Shepherd playing on a Pipe" (71) is notable both for composition and for a certain softness of texture not usual with Claude (is this also the effect of time?); and Captain Dawson's "View of the Seaport of Ostia" (60) is a curious example of the essentially "stagy" character of some of Claude's pictures of this class, which look exactly as if painted for theatre scenes, though, it must be admitted, exceptionally successful from that point of view. What is usually called the "Black and White Room" is entirely occupied by Claude sketches; not of very great interest except as illustrative of his work.

Generally speaking, and apart from the Claudes, this is one of the least interesting of the Royal Academy's winter exhibitions, if considered from a purely artistic point of view. They have got together, no doubt, some historically interesting examples of painters whose works are not much known in a popular sense, such as the Cassone panels by Pesellino in Gallery I.—works, it must be admitted, rather curious than beautiful. The three small Raphaels in the same room do not raise one's ideal of that great name in painting; but in Gallery III. we have one really important work of the master, the large painting, called the "Colonna" Raphael, of the Virgin and Child enthroned, now in the possession of Mr. Pierpont Morgan (85). This, in general composition, is somewhat of the same type as the Ansidei Madonna, the Virgin being enthroned in front of a kind of decorative screen, with attendant personages on either side of her; the picture however is far inferior to the great example in the National Gallery, and has probably been a good deal painted on and restored; the infant St. John is the only figure which may be said to be in Raphael's highest style of design. In Gallery I. we have one of the editions of Quentin Matsys' "Misers" (24), belonging to Lord Cobham, and which appears to be an original*; and we have a repetition of the "Gioconda" of Leonardo da Vinci (40), lent by Earl Brownlow, the originality of which seems open to question. The backgrounds to Beltraffio's two pictures in this room (27 and 35) are of interest from the nature and amount of work put into them; Lord Northbrook's Luini, "Holy Family" (34), is a fine example of this rather weak and sentimental painter; and in a corner by the door is a specimen of one of Mantegna's strange fancies in monochrome—"Judith with the Head of Holofernes," lent by the National Gallery of Ireland.

Gallery III. contains three large upright Claudes of unequal merit, the landscape representing the ruins of Roman sway (77) being decidedly the finest and the most characteristic of Claude's best qualities. Caracci's hard and mechanical copy of Titian's "Peter Martyr" (81) is interesting as a record of a great work gone for ever; Tintoretto's "Delilah and Samson" (83) a piece of respectable commonplace. There are two Titian portraits, of the Marchese Savagno and of the painter himself (84 and 86), not of the first order of Titians; an interesting and spirited composition of "Adam and Eve" seated, by Bronzino (91); Murillo's "Flight into Egypt" (93), a good example of his life-size *genre* method of treating biblical subjects; an example of Ruysdael's landscape (100) which tends to reconcile one a little to Ruysdael—the colour is poor but the picture is admirably composed and full of movement; and a large Vandyck portrait of a lady and a little girl (102), not an ideal Vandyck, but with a large and grand style about it. One of the most satisfying things in the room is Rubens's "Portrait of a Lady" (78), less ambitious in subject than many others, but full of character and thoroughly satisfactory in execution.

Titian's large group of the Holy Family (larger than life), in Gallery IV., is but a mediocre Titian in style and colour, though there is a certain monumental air about it. Guido's "Sybil" (112) is a very pretty head with nothing of the Sybil about it. On the other hand there is a landscape by Rembrandt, a glade in the middle of a wood (123), which is marked by that extraordinary power and originality that Rembrandt put into everything he touched; his trees are as much generalised trees, have as little of special character, as Claude's, but there is a weight and mass of foliage about them compared with which Claude's plantations have but the effect of stage foliage; the road winds mysteriously away into their gloomy shadows; it is a wood in which a scene from the "Faërie Queene" might be imagined. It is a work that would kill any example of Claude in the gallery, if hung next to it.

In Gallery V. Tintoretto shows a pretty piece of decorative figure composition in his small picture of "Pharaoh's Daughter and the Infant Moses" (149); some portraits of Elizabethan ladies, by unknown artists, are of historical interest as to character and costume; and Lord Windsor has lent, under the title "Four Peasants" (169), a realistic study by Velasquez for his well-known and wonderfully powerful but withal disagreeable picture, "Borrachos," sometimes known as "Les Buveurs." The head of the man holding the wine-cup is almost literally given here, and a splendidly forcible study it is.

Among the small works in the water-colour room, not all of them of much interest, we may direct attention to a superb little Gerard Dow (178) lent by Sir Jas. Carmichael; a charming little sunset Dutch river landscape by Cuyp (180), a small but good Teniers (199), and a picture labelled "French School" (222), a three-quarter figure of a young girl, interesting from its simple and touching expression and character.

There have been loan exhibitions at Burlington House which have sent one away in a state of wonder at the power of many paintings of the older schools, and with the feeling that something has been in the art of painting which has departed, never to be revived. But though we are none the less convinced that this is so, the present exhibition in itself hardly fosters this conviction. It rather sends one away with the feeling how

* We cannot but think that the Royal Academy would greatly aid the educational value of these exhibitions by stating, in their catalogue notes, when a picture is only one of a series of repetitions of a subject, and whether it appears to them to be an original or a copy. They never offer any information on these points.

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much there is that we can do better than it was done by many of these Old Masters; how much there is of theirs that is no longer (for us) living or interesting, if people were only candid enough to say so. How many pictures are there in the present collection which would really give pleasure to most people in the present day, if they were not presented under the protection of historic names? Claude indeed maintains his place, for he made a style and a feeling of his own in landscape, beautiful in its way, though conventional in manner and limited in scope. But of Holy Families and such other subjects, is there one here which is really interesting to us, except just as an example of this or that painter's manner of composition and execution? They had a life once, no doubt, but it has gone out now, except in the case of a few examples of transcendent power, in which the art triumphs over the subject. Millais' "Vale of Rest" is worth all the religious pictures in the present exhibition put together. It is better painted than any of them, and it appeals to feelings which are permanent in human nature, and not peculiar to one time more than another. There is a good deal of pretending as to "Old Masters," and it is as well to look facts in the face occasionally, in reference to this as well as other subjects.

NOTES.

The Liverpool Cathedral.

WE may recommend our readers who are interested in this subject to look at the letter by the Hon. Secretary to the "Cathedral Site Petition Committee," printed on another page, in answer to Mr. J. Oldrid Scott's in our last; and we may add that while we are very glad to give space to Mr. Scott as an eminent church architect and the son of a still more eminent one, to state his views, our opinion on the subject is not in the least modified. We are glad to see that there appears to be a strong feeling in the country on the subject, else where than in Liverpool, and we may particularly notice an admirably written letter in the *Standard* signed "J. H. M.," in which the author, writing from Leicester, complains that they have suffered in that town from the shortsighted policy of "cheap sites" and building churches in back places. He appropriately cites the example of the church at Montmartre, which owes half its effect to the commanding site on which it is situated, and whence it seems to dominate Paris. We may add that we hear great complaints that the leading Liverpool papers will print letters and statements in defence of the proposed site but refuse to give publication to anything written on the other side: we observed indeed that the *Liverpool Courier*, while printing Mr. Scott's letter in our columns, carefully avoided printing our comment on it.

The Preservation of Steelwork.

FOR the proper preservation of wrought iron or steel work it is not sufficient merely to cover the surface with paint, or even to imbed the metal in material believed to be air-proof or water-proof. All scale, rust, dirt, and moisture should be carefully removed as a precautionary measure. In some cases scale will ultimately fall away, leaving parts of the metal bare, and it always exercises a deteriorating effect, especially upon steel, for it consists of magnetic oxide, which is negative to steel and is therefore a fruitful cause of corrosion. Similarly, rust, dirt, and moisture must be removed, because the first of these will continue the process of oxidation, and the others will commence it in parts hitherto unaffected. In important engineering works it is generally stipulated that all foreign matter shall be removed from the metal before painting or similar treatment, but in building construction where steelwork is ordinarily hidden away so that deterioration can never be seen, special precautions are rarely taken. Scale, rust and dirt are often simply covered with paint, the steelwork is put in place, buried, and forgotten; or perhaps in a similar state, but without a coating of paint, it may be embedded in concrete. In either event, serious corrosion must ultimately ensue. Hitherto the removal of scale has been most frequently effected at a small cost by pickling in dilute acid, afterwards neutralising by lime-water, washing, and drying. More recently the sand-blast has been employed with considerable advantage. This ingenious apparatus has been much used for cleaning off scale, paint, and other substances from iron and steel ships before painting or repainting, and quite recently it was applied with great success to the ironwork of a station on the Manhattan Elevated Railroad in New York, for thoroughly scouring the metal surface before applying a new coat of paint for experimental purposes. The question of its employment for the preparatory treatment of structural steel work is well worthy the consideration of architects. But supposing the metal has been thoroughly cleaned and dried, it is by no means safe to assume that brickwork, masonry, or concrete will necessarily afford protection against corrosion. Vibration and climatic influences may cause fissures, affording access for air or moisture in all these materials, whilst brick and stone are permeable, and apt to retain moisture. Moreover, the process of partial decomposition results, especially in brickwork, in the formation of salts of corrosive tendency. Hence a coating of suitable paint or other material is very desirable for wrought iron or steel surrounded by brickwork or stone masonry. Portland cement concrete is undoubtedly the most efficient protection known, and there are many well-authenticated examples of its value. If properly made and applied, it should be so far air and water tight as to afford a really efficacious safeguard against corrosion, and preliminary painting will then be unnecessary. Some parts of the Niagara Suspension Bridge embedded in cement, when examined eighteen years after the completion of the structure, were found to be free from rust, and the original paint was still quite fresh. Again, some details of structural ironwork found embedded in mortar, and believed to have been so placed fully 500 years ago, were found to be in fair condition on being taken out. As the durability and safety of the modern building depends so much upon the preservation of the original strength of its steel members, it is greatly to be desired that the architect should consider for himself how this object may be best attained, and that he, as the person directly responsible, should delegate as little as possible to the manufacturer or the merchant, whose responsibility is of far more limited nature.

Engineering in Modern Buildings.

AN interesting discussion is now in progress by the American Society of Civil Engineers on the "Mechanical Installation in the Modern Office Building." A large office building of the present day exhibits many of the necessities of a city, but the engineering details must be suitable for an exceedingly dense population, and should provide for varied requirements of individual tenants if success is to be fully attained. Amongst the essentials there are several that are not properly met in this country. Heating is usually effected by an ordinary fire, for which the management insists upon providing fuel at excessive rates, and sometime refuses to allow alternative methods unless payment be made for coal that is not consumed. Even when a tenant is free to install hot-water heating apparatus at his own cost, there is rarely any available place for a boiler or any suitable route for the circulation pipes. Ventilation is rarely considered at all. The American practice of warming and ventilating an entire building upon a comprehensive system is infinitely to be preferred to the haphazard methods prevailing in this country, and its adoption ought to be beneficial to tenants and proprietors alike. Steam boilers would of course be required, and if utilised for the generation of electricity, additional advantages might be derived. Cold water supplies are already efficient for ordinary purposes, but hot water for lavatories seems to be regarded as a totally unnecessary detail, and lavatory basins in private offices are rarely if ever seen. Such requisites as these are always furnished in the American office building, to say nothing of the supply of cooled and filtered water for drinking purposes. Fire protection is another point in which our buildings are deficient. Electric alarms, chemical extinguishers, and hydrants are not particularly prominent features, and the theory that valuable papers and other property cannot be improved by a deluge of water does not seem to be very generally accepted. A system of extinguishing fires by chemical means would be infinitely preferable, or even the device practised on shipboard of filling the room with steam. These are some of the points that ought to be more fully considered by proprietors, and more emphasized by architects, for we are assured that intelligent enterprise in such directions would not be without its just reward.

German Electrical Work.

AT the Institution of Electrical Engineers this week the reports of the various committees appointed on the visit of the Institution to Germany last summer were discussed. Although nothing very novel appears in the reports, yet they will prove instructive to the electrician, as they emphasise the main points of difference between German and English practice. The elaborate design of the buildings, of some of the factories, and the large and clean engine-rooms seem to have impressed the committee. The two main systems of distribution employed are direct current and three-phase alternating. For transmitting power to a distance three-phase mains with direct-current distributing stations is the favourite solution. Accumulators are more largely employed than in this country. Accumulator cars are much used for electric traction in the centre of large towns, notably in Dusseldorf

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and Berlin, but in Dresden Siemens' conduit system is employed. These systems are, of course, not as economical as the trolley wire, but they get rid of all the unsightly overhead work. One of the most noticeable features in all the works visited was the very large engineering staff employed. The average proportion was one engineer to every ten men. One reason of the large staff seems to be that very much greater care is given to experimental detail and general testing than in this country. Another is that the consulting engineer is practically non-existent in Germany, and so, much of the work that would be done by the consulting engineer in this country falls on the staff of the contracting firm. The use of the uninsulated middle wire in direct current systems of distribution seems to have struck the committee, but they apparently do not know whether to think it advantageous or not. We believe that its drawbacks more than counterbalance the slight saving in initial cost. With this system it is practically impossible to locate faults, and the waste of energy in leakage currents is often very heavy. The committee on telephones presented a very brief report. The only interesting points in it are that the telephone service in Berlin is discontinued when a thunderstorm is threatening, and that guard-nets, with a wide mesh about a foot square, are placed in some places as a protection against the possibility of a telegraph or telephone wire falling across the trolley-wire.

Brixton Prison.

IN last August was held the seventh and last sale of the materials of the military prison at Brixton-hill which is now being rebuilt. The former gaol had been erected as a convict prison. It was then converted for purposes of a military prison, with a capacity for 450 prisoners, but remained unoccupied during the past four years. The treadmill, invented by a Mr. Cubitt, of Lowestoft, and completed in 1821, was, it is said, one of the first set up in London. As recently as six years ago there were sixty-eight treadmills and cranks in operation in prisons under the jurisdiction of the Prisons Commissioners, but fifty of them have been discarded since in favour of more advantageous appliances. The new buildings at Brixton, covering an area exceeding seven acres, are intended for male prisoners who are remanded from the police-courts, and for those who, having been condemned to death, will suffer execution of sentence there when Newgate Prison has been pulled down. The plans include a hospital, a remodelling of the chapel with a gallery for Roman Catholic prisoners, waiting and consultation cells, and other modern improvements. The contractors are, we gather, Messrs. Drover, of Islington, who will finish the works in the course of the summer.

The School for the Indigent Blind.

THE new school buildings, upon a site of fifteen acres at Leatherhead, of which Princess Christian recently laid the memorial-stone, will replace the premises to be vacated in June this year at St. George's-circus, Southwark, which, with the site, have been purchased for 140,000*l.* by the Baker-street and Waterloo Railway Company for purposes of a generating station. The school was originally opened for fifteen inmates by four benevolent individuals in 1799, in what had been the notorious Dog and Duck tavern in St. George's Fields. Those premises being taken twelve years afterwards for the site of Bethlehem Hospital, the governing body bought a freehold site opposite the Brass Crosby Obelisk (1771), and there erected a new school for 112 patients. On April 25, 1834, Archbishop Howley, as President of the Charity, laid the first stone of the present buildings designed after the domestic Tudor style by John Newman, whose plans comprised an enlargement and a remodelling of the former premises so as to provide for a total of 220 inmates. The new buildings at Leatherhead, we read, will receive the same number for the present, and are designed by Mr. C. Pemberton Leach.

Excavations in the Holy Land.

FROM a recent number of *L'Illustrazione Italiana* we learn that excavations of importance are taking place at Sidon. They appear to be at the expense of the Turkish Government—under the direction of the Museum authorities in Constantinople, and the superintendent or foreman is an Italian. But for the present all particulars are wanting. Some photographic representations of the base of a huge monument supposed to be Phœnician are given in *L'Illustrazione*, and it is claimed that an ancient temple of great size and importance has been discovered.

The Society of Oil Painters.

THE exhibitions of this society are improving. The present one, now open at the gallery in Piccadilly, is one of the best we have seen. The President, Mr. Frank Walton, exhibits in the central room a landscape under the title of "All on a Morn in May" (210), remarkable for the exceedingly forcible manner in which a large tree is painted in the foreground, whose masses of foliage cover the greater part of the canvas, and the clear air and distance seen beyond it. Mr. Byam Shaw paints a puzzle for the visitors in "Time and Chance Happeneth to All Alike" (172), a quasi-mediæval riddle which we cannot profess to read; but it is clever to a degree in execution, and the figure on the right is charming. Near it hangs, as the opposite extreme of art, M. Fantin-Latour's "Andromède" (170), no new reading of the legend certainly, but a beautiful figure-study in his highly original style. Mr. Reid's various sea pictures show a curious and not always quite satisfactory treatment of the sea, but they are full of air and movement, "Home with the Catch" (140) being the most important. Mr. Melton Fisher (Vice-President) sends a charming half-length portrait of "Mrs. Melton Fisher" (137). Figure pictures are not the strong point of the exhibition, but Mr. Frank Dadd is very good in his semi-humorous subject, "A Round Table Conference" (117) where the heads of the three men are shown partially lit up by candle-light, and Mr. Dollman in "The Good Samaritan" (28), which is humorous or pathetic, in proportion as you are or are not a cyclist. Mr. Herman G. Herkomer's "Interior" (40) is an admirable drawing-room scene with two figures, full of character and all the details most conscientiously painted. Mr. Kennington produces an effective grouping of semi-nude figures under broken lights in his "Serena Found of Savages" (66), though those who know their "Faerie Queene" will hardly accept these clean and respectable savages for the half-bestial creatures imagined by Spenser. Mr. Henry Stock has produced a really remarkable fancy in his "Earthflower" (70), a plant with large leaves bearing a human head as the blossom; the whole very finely painted—one of the best things he has shown here. A new school of heavy, dark, and rather crude landscape is somewhat too much represented by various works not deficient in power but somewhat conventional in style and loaded in effect. There are other good landscapes in what we may call a healthier style; Mr. Tatton Winter's small work "Betwixt the Gloaming and the Mirk" (52), noteworthy for its real effect of evening light; Mr. Herbert Marshall's "London Bridge" (68), a more correct drawing of a Thames bridge, as might be expected, than we usually have from painters; Mr. Thorne Waite's "The Haywain" (120) and "The Mill Stream" (124); Mr. Peppercorn's "Dartmoor" (239); Mr. Orrock's "Holy Island Sands" (242); and Mr. John Collier's "A Devonshire Combe" (264), a beautiful landscape, and a kind of work that we never remember to have seen from this painter before. Miss Fortescue-Brickdale has a remarkable picture, "The Ugly Princess" (248), showing great power of colour; and Mr. Nettleship's "A Lone Wolf" (296) is quite in his best way as a piece of animal painting. There are a good many other works worth mention did our space permit.

The late Mr. John Brett, A.R.A.

THE announcement of the death of Mr. John Brett, which involves a great loss to English art, can hardly have come as a surprise to those who were aware of the state of his health for some time past. For the last two years it might have been noted that his large and striking sea-pieces were no longer prominent on the walls of the Royal Academy, and he was represented only by small works—some of them, however, of great beauty. Mr. Brett was a determined realist in landscape art, and with such a power of realism that his works went far to convert one to his creed. His picture called "Boulders," exhibited many years ago at the Academy, was one of the most remarkable examples ever seen of the pre-Raphaelite faith that everything in nature is interesting if you only paint it thoroughly down to the minutest detail. Later he took more decidedly to open sea pictures, always marked by the same force of realism and the same powerful effect of air and sunlight. His large painting, "Britannia's Realm," purchased by the Trustees of the Chantrey bequest ("rather humiliating," as he said when a friend congratulated him on the fact), when we first saw it on "private view" day, impressed us as if an actual vista out to sea had been caught between the crowd of visitors. He was conscious of his own powers, and during many years that he was an outsider and no good friend of the Academy, it was his boast that nevertheless "they dare not hang me badly." Mr. Brett was much interested in architecture, and influenced in some cases the decision of the Academy as to the subjects for architectural prizes; and he evinced his practical interest in it by twice over building his own house from his own plans—in each case a one-story house with

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a special treatment. Socially and in conversation he was somewhat like the proverbial Ishmaelite—"his hand was against every man," and many are the witty and sarcastic criticisms on men and things which his friends (or sometimes his enemies) could recall. One of the best was in answer to a remark that a certain eminent art-critic was the greatest prig in London: "I should not put it that way," said Brett, mildly; "he is the greatest prig in the solar system; there cannot be another inhabited planet with another Mr. ——." Peace to his ashes! He said many "bitter words," but he had firm friends, and at all events he painted splendidly.

COMPETITION FOR NEW OFFICES FOR THE HEARTS OF OAK BENEFIT SOCIETY.

THE drawings submitted in this competition have been on view during this week at the present offices of the Society, Charlotte-street, Fitzroy-square. The competition must be characterised as one admirably conducted, under the guidance from the outset of the assessor, Mr. Sidney R. J. Smith, who drew up the conditions, answered the numerous queries, arranged the drawings, and made the award. Hence it is that with the drawings are hung up the Reports of the competitors, a custom which should be universally adopted, but is more generally neglected. Copies of the conditions and site plan, of the answers to queries, and even of the assessor's Report are also hung up for reference by visitors.

The number of competitors is small considering the importance of the building, twenty-two sets of drawings being all that have been submitted, but the quality of the designs is far above the average level of work in open competitions. The ruck of hopelessly inferior designs, which usually swells the number and lowers the average quality, is on this occasion absent.

The one flaw in the competition is that so frequently occurring: the promoters want too much for their money, and we agree with the assessor that no design submitted that is worthy of consideration for excellence of plan can be carried out for the 45,000*l.*, which was the suggested sum. Many of the competitors have wisely stated a reasonably fair estimate for their designs, and pointed out what curtailment of the scheme would be necessary if the expenditure must be limited to the sum named.

The site is a good one in the Euston-road, facing St. Pancras Church, and running through to Grafton-place in the rear, the only drawback being that it is somewhat pinched for light. Competitors had to bear in mind that the property on each side of that now to be built on belongs to the Society, but cannot at present be dealt with. They were, however, asked to design flanking elevations to the present scheme.

The problem set to the competitors was one in the solution of which few, if any, could have had much previous experience—the planning of offices for a business organised in many departments, and full of detail of an unusual nature, involving attention to some ten to twelve thousand letters and numerous callers every day. Added to this are a hall to seat about 300 delegates, a council-chamber for fifty members with committee-rooms, and necessary adjuncts, so that the problem was by no means easy.

The first premiated design, No. 17, is an admirable example of artistic planning combined with excellent working capabilities—symmetrical in disposition, effective in internal grouping, and convenient in arrangement; undoubtedly the best in plan amongst many that are good. The large public office is on the axial line, and with its surrounding offices, from which by glazed screens it is partly lighted, reaches to the Grafton-place front at the rear of the site. Further light is obtained by a large circular opening extending to the roof, which forms part of the effective grouping of the interior. The delegates' hall and the council-chamber are on the first floor, the committee-rooms on the second floor. Basement, third and fourth floors, and a mezzanine between part of ground and first floor, are occupied by the numerous departments and adjuncts of the working offices. The elevation is dignified in that phase of the Later Renaissance which the recent work of Mr. Belcher, Messrs. Gibson & Russell, Messrs. Lanchester, Stewart, & Rickards, and others has established as the mode of the moment in municipal buildings. The authors estimate the cost of their design at 48,601*l.*, which is certainly somewhat sanguine, and for which, as the assessor points out, the building could be carried out only by the strictest economy, not to say "cutting-down."

The second premiated design, No. 3, apparently owes its position chiefly to the small demand for light which it makes upon the property on each side. Although on quite different lines to the first premiated design, it falls but little short in convenience of working. The central feature on plan of the ground floor, the large public office, has a circular counter, within which are the officials and around which the public have ample space. The plan is distinctly economical, as, though priced at a much higher figure than the first, the cost is kept down to 46,048*l.* To do this, however, a vital error is committed, which we did not see referred to in the assessor's Report. The delegates' hall, 81 ft. 6 in. by 36 ft. 6 in., seating 300, is only 14 ft. high. The basement is somewhat meagrely lighted, so that the plan is by no means faultless. The elevation is somewhat florid and redundant in features, and suggests the Carlton Hotel type of treatment.

The third premiated design, No. 22, has, in the words of the assessor, "a good simple plan." The general office is, as in the first premiated design, on the central axial line with offices around, side-lighted and with top lanterns. The elevation is quiet and dignified, of a similar type to the first, the detail drawing being of easily recognised draughtsmanship. The authors' estimate is 44,966*l.*

The assessor especially commends the elevations of No. 2 and No. 5, and with that commendation no impartial critic can disagree. Both are by well-known and successful competition experts. The assessor prefers No. 2, but for ourselves we can find little difference in point of excellence. In plan we think No. 5 is slightly superior. Both have excellently designed halls for the delegates, but neither would be so smooth in working as the first premiated design in its office arrangement. The estimate of No. 2 is 45,000*l.*, that of No. 5 the same, but both estimates are, we think, over-sanguine.

In these five designs specifically mentioned by the assessor is the cream of the competition. The first premium has been awarded to the best plan, but none is absolutely perfect. The second premiated plan is original, and has many excellent points, but also some, in our opinion, serious faults.

Of the remaining seventeen designs it would hardly be fair to particularise any without speaking of all. If they must be placed in the second class to the first five, there is scarcely one that could be relegated to a third class. All that can be honestly said in disparagement is that some have elevations not equal in quality to their plans, and others plans that are not as good as their elevations.

CONCRETE AND BRICK CONSTRUCTION WITH CONTINUOUS INTERWOVEN METALLIC CORES.

BY H. E. P. COTTRELL, A.M.INST.C.E.

THE above description applies with a considerable amount of accuracy to a system of construction which has been steadily growing in favour with architects and engineers on the Continent, and has found its way across the Atlantic into the United States, but is very little known in England.

The Cottançin construction, as it is termed, consists essentially of the introduction into concrete and brick structures of a series of thin rods or bars which, starting from the foundations, are carried through walls and floors right up to and through the roof. These rods or bars are interwoven at suitable intervals on the plan of basket-work, so as to form a continuous whole throughout the building, the individual elements of which are so knitted on the one to the other, that they are constrained to act in concert. In this way local stresses in the various constituent parts of the building are dissipated by transmission and distribution to the remainder, and they eventually find their way to and are lost in the foundations. The building, being thus made to act as a whole, is necessarily less dependent, on the quality of the foundations and on redundancy of material in parts of the structure for its stability than buildings not so circumstanced, and considerable economies become possible. This is the practical reason why this form of construction has been steadily advancing in favour in France, where it first originated, and has spread thence further afield.

From the diagrams which accompany this paper the main characteristics of the continuous metallic core which is its basis may be readily gathered. Figs. 1 and 1A exemplify the essential difference between a woven and a non-woven core composed of rods or bars. The woven core may be pulled out of shape, but its solidarity cannot be destroyed except by actual cutting or fracture at more than one point; whereas the non-woven core, whose members are attached by independent wires at their intersections, can comparatively easily be destroyed by pulling out one member after another without any cutting or fracture.

Fig. 2 shows how the system is carried out in the construction of flooring joists, and how the horizontal rods which impart to these joists the required tensional strength, are interwoven so as to act in concert, and the attachments afforded for the coring of the concrete flooring which they support.

Fig. 3 shows the way in which an ordinary floor of concrete with a woven core is attached to the walls of the building and the woven coring which runs through them, and also exemplifies the way in which the joists are joined on to the flooring where joists are used. Fig. 4 shows the application of the same system to brickwork construction with hollow bricks having perforations. The interweaving process here is confined to the lines of departure of the cross walls, the floors, and the roof, the elements of the core running otherwise straight up, from the sill-bars in the bottom course of the foundations, vertically through the perforations of the bricks, which are laid in the ordinary fashion to break joint, from bottom to top of the building.

It will be noticed that with the Cottançin system of flooring construction, a reversion has been made to the old form of joist and board floors. This is still more noticeable in the type adopted in buildings of a domestic character where ceilings are provided. Here the ceilings are formed of plaster slabs used as shuttering, between the joists in forming the concrete flooring, after the joists are in place, and then lowered on to the projecting mouldings with which the under edges of the joists are finished off. The air space left between floor and ceiling forms a sound-proof diaphragm between the stories, which is much appreciated in buildings arranged almost universally as flats throughout the better part of Paris, and in other parts as tenements. This same air space is repeated in the superior class of buildings, not only in the floors, but in the walls and roof, making them fairly proof against changes of temperature, and in the case of the attics, really habitable, which, with the ordinary mansard-roof construction, cannot be said to be the case. The voids in the walls, floor, and roof afford ideal space for the accommodation of all the varied appliances connected with heating, ventilation, and lighting, the supply of water, as well as communication in the interior of the building and between the building itself and the various exchanges. The necessity for devoting such a considerable proportion of the interior space of each room to chimney breasts and flues is wholly done away with, as none of these need trench on that space when they are accommodated in the interior of the walls. According to the building regulations of the Municipality of Paris, builders had been long since prevented from using chimney breasts as piers for either stiffening the side walls of their buildings or supporting their floors. If chimney breasts have been continued to be built in Parisian houses for years past it has been almost wholly owing to the lingering popular prejudice in favour of the appearance of rooms provided with them and the impracticability, under ordinary conditions and with ordinary forms of construction, of providing the requisite accommodation for flues in the interior of the walls without unduly increasing their thickness.

The increasing demand for fireproof construction in buildings has doubtless led to the evolution of the many types in which a metallic core is inserted and built into the substance of the structure to specially provide for

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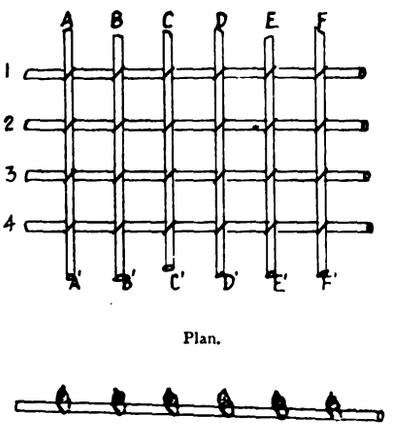
a certain portion of the strains to which it is subjected, and to do away with and replace the suspiciously inflammable woodwork. The essential difference between these various types from this point of view lies entirely in the disposition of the metallic core with reference to the surfaces of the structure against which in case of fire the heat generated would have an opportunity of acting. In the Cottançin system the core is removed relatively so far from the surface that the heat has little or no chance of causing the destruction of the building by the disintegrating action of the progressive expansion of the metal and its sudden contraction resulting from contact with water. For moderate temperatures the co-efficient of expansion of Portland cement and steel are so closely similar that thin panels made on the above system, tested at the instance of the Ministry of Public Works in the laboratory of the School of the Ponts et Chaussées in Paris, by heating to from 194 deg. to 266 deg. Fahr. six successive times and then quenched suddenly in cold water, showed not the slightest crack or change of shape of any kind.

The increase of tensile strength imparted to concrete slabs by the addition of a woven core on the Cottançin system is exemplified by the following example :—Two identical slabs 3 ft. 3⅜ in. square were prepared, each 1¾ in. thick, one with a wire core, the other without. The first sustained a load of 2¾ tons, and gradually attained a camber of 1½ before giving way, while the second gave way suddenly without sensible camber at a load of just over half-a-ton. Both the slabs were suitably supported free, and the experiment formed part of a series carried out by the military engineers, under instructions of the Ministry of War, in connexion with the proposed application of the system to fortifications. The Cottançin system in France and the French Colonies has been extensively applied to the construction of both open and covered reservoirs and tanks connected with sewage and waterworks, as well as filter-beds, water-towers (supports and tank having a continuous woven skeleton, and being practically cast in concrete), sewers, and drainage pipes, &c. The application to baths and washhouses built on the edge of rivers and watercourses entirely on made soil and river alluvium has been one of the most successful—these being floated, as it were, on the semi-fluid substratum.

The application of the system to caisson work, especially when under pressure, for bridge and wharf foundations, to weirs, to turbine chambers, to tunnel linings, &c., has been equally successful and economical. In foundations of the inverted box type, divided into cellular compartments, designed to replace sheet piling combined with ordinary piling necessary in the case of specially fluid subsoils, to permit buildings of any weight to be supported thereon, the success of the Cottançin system has been most conspicuous. The problem of rebuilding the modern town of Tunis, in the immediate neighbourhood of the harbour where the business quarter is situated, on ground below which the strata consists entirely of the silt of an ancient lagoon to a depth exceeding 100 ft., caused the local administration to carry out extensive experiments with all available systems of foundations. These experiments demonstrated that, whereas the ordinary foundations were incapable of supporting a surcharge exceeding 31·66 lbs. per square foot without irregular and serious subsidence, the cellular inverted box type constructed by the Cottançin Co. enabled the surcharge to be increased to 777 lbs. per square foot, with a uniform subsidence of only 0·08 of an inch. On increasing the surcharge to 1,711 lbs. to the square foot (over 17 per cent. in excess of the official maximum), the subsidence, which was still uniform, amounted to only 1 3/16 in.; the surcharge had to be increased to over 100 per cent. beyond the official maximum before any tendency to unequal subsidence was evinced.

A brief description of some of the more important works which have lately been carried out in accordance with the Cottançin system in France, and especially in Paris, will prove of interest. The factory of the International Society of Alimentation (Quay du Loire), occupying an area near the river, the ground being of a most unsatisfactory character, was lately erected on a partly sunken tank foundation—with double walls of hollow brick 2¾ in. in thickness and with double floors in concrete of the same thickness



Plan.

Section.

Fig. 1.—Trellis Work on the Ordinary System.

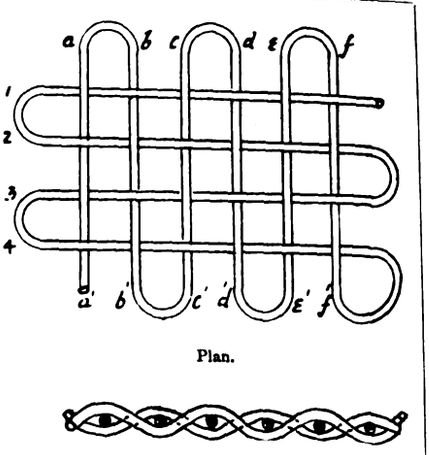


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Fig. 1a.—Trellis Work on the Cottançin System.

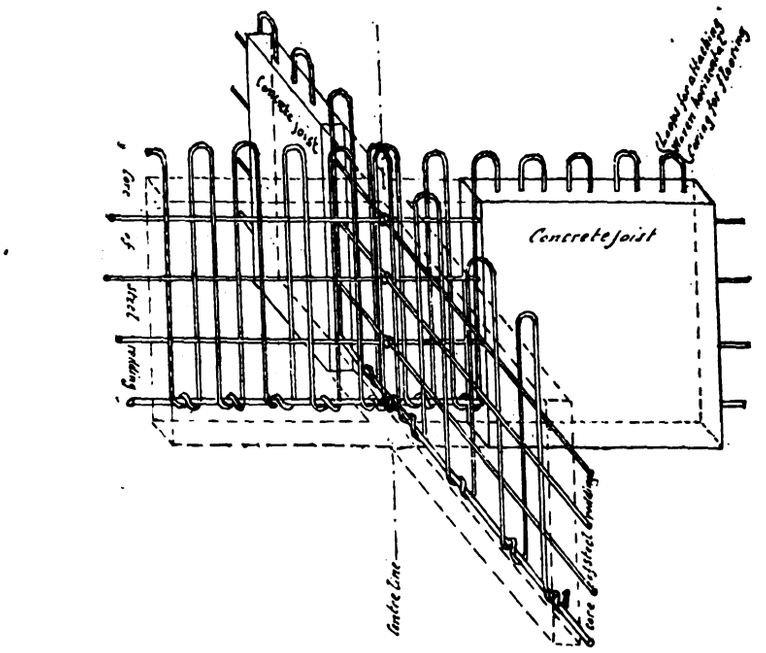

Fig. 2.

Intersection of two joists, showing arrangement of steel rodding forming the core for the cement concrete.

—the surcharge being calculated at 2½ tons per square metre (quarter of a ton to the square foot). These double walls and floors were carried out in connexion with the basement only, which is used for cold storage, save in the case of the bacon-curing house, which was carried up to three stories with walls 2¾ in. in thickness, the load on the foundation-bars (sills) of this structure being sixty tons.

The Schweitzer Biscuit Factory was lately constructed with a raised floor over the biscuit ovens to support a distributed load of one-tenth of a ton to the square foot. This floor is supported on piles of cored brickwork 8¾ in. by 15¾ in., with shoes of the inverted box type, also in cored brick, the raised floor projecting 4 ft. 10½ in. beyond the line of piles and constructed in cored concrete 2 in. in thickness with stiffening ribs. The elements of the coring were in this work unevenly distributed in accordance with the varying distribution of the stresses, and the openings for the oven flues were worked in like the buttonholes in a garment, and became in this way points of strength instead of weakness.

Rigault's Oil Factory is an example where the distributed load is greater still for floorings no thicker than 2 in., the ribs or joists having in some cases as much as 40-ft. spans, and the distributed load, consisting in some cases of crushing mills, amounting to half-a-ton to the square foot. This factory was rebuilt on a cored concrete platform 2 in. in thickness, and consists of four stories ; the brick walls and the internal brick pillars are all in cored bricks and of very slender construction.

The experiments carried out in connexion with these cored brick structures at the late Exhibition demonstrated that these perforated bricks (8¾ in. by 4⅜ in. by 2¾ in.) can resist safely compressive strains of thirteen tons to the square inch, while the steel core could stand tensile strains of ten times that amount. The great Paris Exhibition of 1900 furnished—as those who afforded the time to examine the buildings as well as their contents readily observed—a unique opportunity for experiments in every conceivable kind of construction—the Cottançin among many others. Two are worth mentioning as specially illustrating the economy of this style of construction and its adaptability to foundations for heavy machinery. The first was the official pavilion of the Republic of San Marino, erected adjacent to one of the legs of the Eiffel Tower. This was a three-story brick building surmounted by a cupola roof. The subsoil was the usual tipped rubbish ground of the Champ de Mars, and the foundations were of the inverted box type, the bottom being represented by the platform on which the building is built. The walls and foundations were entirely of cored brick 2¾ in. thick as well as the ribs of the cupola ; the remainder of cored plaster slabs. There were no additional counterforts, and no iron or wood framing. The flat roof and the floors were in cored concrete 2 in. thick. The cost per cubic foot of enclosed space in the pavilion was only 1¾d. against an average of the other national pavilions, which, generally speaking, consisted chiefly of timber, laths and plaster, and were highly inflammable, of 19¼d. per cubic foot.

The other example was the cellular boxed-

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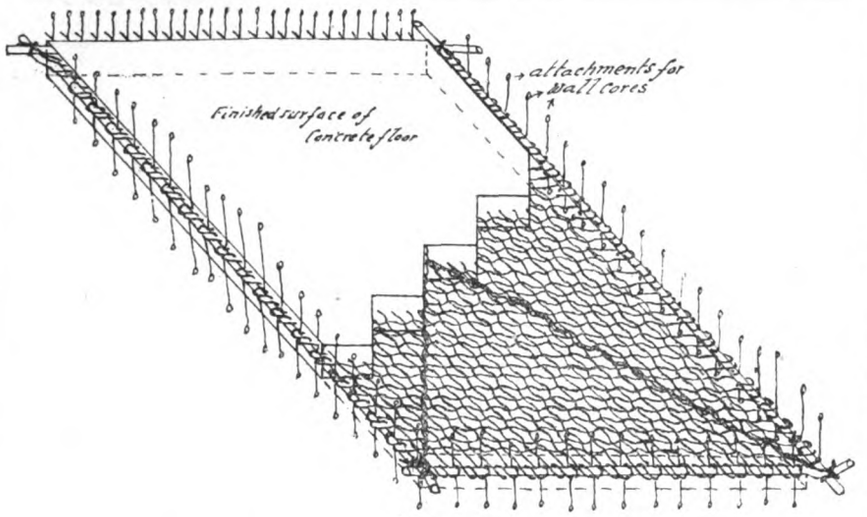

Fig. 3.

Concrete floor with core formed of steel webbing, showing method of attaching it to walls. The webbing is either woven in place or laid ready woven; or expanded metal may be used.

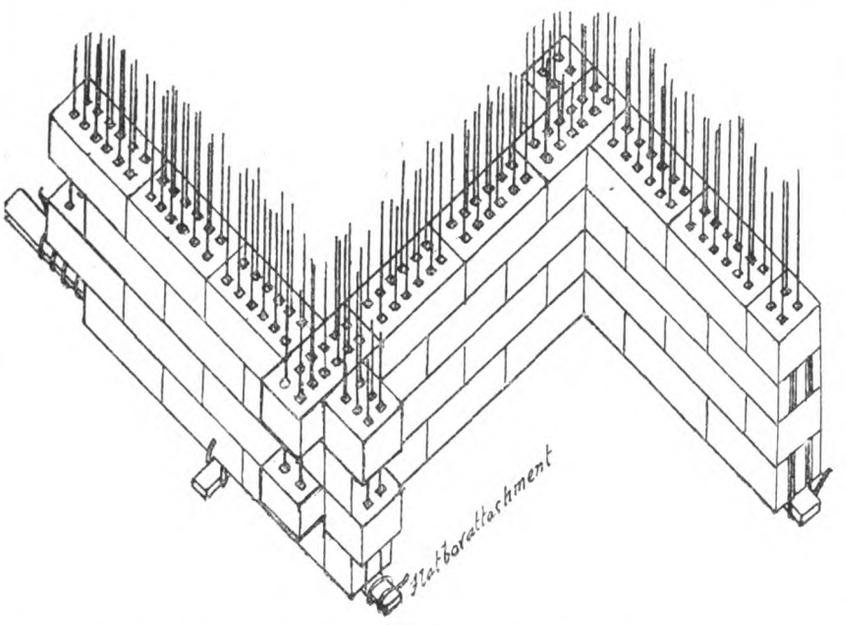

Fig. 4.

Perforated brick foundation with steel core, showing the Cottançin method of brick construction in single brick walls and partitions.

shaped foundations for the 500 h.-p. Cockerill gas engine in the Belgian section. These were carried down some 20 ft. into the same made ground, and the walls were all of cored brickwork, 2¾ in. in thickness, the cells being filled up with sand, so that each one acted as a sand pile. The stroke of the engine was equivalent to ¼ ton blow per every $\frac{1}{10}$th of a second when working. This inexpensive foundation stood in the most satisfactory manner, the little or no vibration communicated therefrom being specially remarked upon.

An important building work connected with the late Exhibition, though not of it, carried out to a large extent on the Cottançin system, were the huge blocks of hotel buildings (now used as flats) put up overlooking the foot-bridge across the Seine near the Trocadero in Passy. The upper stories and the mansard sides of the roofs are entirely in 2¾-in. cored brickwork—the flat roofs being in 2-in. cored concrete with 4-in. ribs to stiffen it—all the round lantern windows being formed without separate frames, the coring being worked round them basket fashion.

Another example of the adaptability of the Cottançin system to the somewhat difficult conditions of the Parisian Building Acts which prescribe a limiting radius for the outline of the structure of the roof in proportion to the building itself. The Hotel Ritz, on the Place Vendôme, has had the old roof taken down and a roof of the Cottançin type erected in its stead. By this means an extra habitable attic story has been added, which is a matter of considerable importance on a site costing over 60,000*l*. The walls dividing up these attic stories with the woven coring running through the whole take the place of the framework of the old roof. The walls are of cored bricks built to the curved mansard outline; the top is flat and of cored concrete, no lead or zinc is used for flashings or on the flat, the concrete being rendered in cement in lieu thereof. Walls and roof are constructed hollow, the inside being of cored plaster slabs used as temporary shuttering while putting in the concrete, and then dropped into position. Several important factories have been erected in various parts of Paris and the suburbs on similar lines to those previously described as well as many public and private buildings, such as the very remarkable seven-story produce-building in the Avenue Rapp, where the ceramic decorative panels of the façade are incorporated with the structure by means of the steel-woven coring instead of being simply overlaid.

A church only just completed at Montmartre, close to the Church of the Sacré Cœur, is in many respects the most extraordinary structure in Europe. This building, which is divided into an upper and lower church, the total height being 115 ft., has cored brick walls only 4½ in. thick, stiffened by counterforts 18 in. by 18 in. The floor dividing the two churches is of cored concrete 2 in. thick, stiffened by joists 14 in. by 4 in., with 40-ft. spans. The top is formed by flat domes with cored brick ribs projecting on the outside, the spaces being filled in with cored concrete 2 in. in thickness, while the voids are levelled up with coke breeze, and overlaid with a thin surface of cement rendering.

Many more interesting examples of the Cottançin type of construction could be given, of several of which the author has photographs and particulars before him and has also personally seen; but sufficient has probably been said to give a fair idea of an interesting and novel system which is not as well known on this side of the Channel as it merits to be.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

TWO IONIC CAPITALS IN THE BRITISH MUSEUM.

A MEETING of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, W., Mr. John Slater, vice-President, occupying the chair.

The minutes having been taken as read,

Mr. Alexander Graham, hon. secretary, announced the decease of the following gentlemen:—H. E. Martineau, elected an Associate in 1851, and a Fellow in 1860; Hugh Leonard, honorary Associate, elected in 1878; and E. W. Smith, honorary Associate, elected in 1900.

The Chairman said it must be a matter of regret to them all to notice the recent sudden death of Mr. Smith, at a comparatively early age. Those who knew the work he did for the Archæological Survey of India must appreciate the loss which the Indian Government and others had sustained by the early decease of Mr. Smith.

Members attending for the first time since their election were introduced to the Chairman, including Mr. Arthur Clyne, President of the Aberdeen Society of Architects.

Mr. Alexander Graham announced the receipt of a large number of donations to the library. A list of them would appear in the next issue of the *Journal*, and he asked the meeting to accord a hearty vote of thanks to the donors.

This having been agreed to, the Chairman called on Dr. A. S. Murray to read a paper on "Two Ionic Capitals in the British Museum," of which the following is an abstract:—

In his opening remarks Dr. Murray said that Professor Meurer, of Rome, visiting the Museum some months ago, identified one of the Ionic capitals in the collection as from the Temple of Wingless Victory at Athens. It was an angle capital from the south-west angle, and was brought over by Lord Elgin, together with some slabs of the frieze. The temple had four Ionic capitals at each end—none along the sides; hence, probably, the later name of the temple, Wingless Victory. The official name was Athena Nikè, which was definitely confirmed some years ago by the finding of an inscription in the form of a public record ordering the building of the temple. The inscription is on marble, and states that the designs were to be left to Callicrates, whose name is familiar as one of the architects of the Parthenon. The date of the inscription is agreed to be not earlier than 450 B.C., but not much later—that is to say, about ten years before the completion of the Parthenon. It does not follow, however, that the work had been put in hand at once. There is another inscription added on the same slab obviously some years later, about 430 B.C. Accordingly, between these two dates, 450-430 B.C., the temple had been built. At the latest it is therefore older than the Erechtheum. In the Elgin Room at the Museum can now be studied an angle capital of the Erechtheum side by side with the newly-identified capital of Athena Nikè. The capital of the Erechtheum is exuberant in its beauty; the other is simplicity itself. The author went on to describe the capital of Athena Nikè, indicating various characteristics in the treatment of the ornament which go to prove its greater antiquity. There is in the museum a fragment of an angle capital of the Ionic order from the temple at Bassæ by Ictinus, the colleague of Callicrates in the building of the Parthenon. It would be satisfactory if the newly-identified capital could be claimed positively as the work of Callicrates. The Bassæ fragment, however, Dr. Murray considered both simpler and grander in its lines, and there was still the question whether the commission given to Callicrates about 450 B.C. for the Victory temple had ever been executed by him. Incidental reference was made by the author to a small terra-cotta capital, archaic Ionic, obtained

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from Gela, in Sicily, two or three years ago, which bears traces of colours—red, white, and blue.

Coming to the second capital to be treated of, the author referred to the Ionic capital from the archaic temple of Diana at Ephesus, described in his paper on "The Sculptured Columns of the Temple of Diana at Ephesus," read at the Institute in 1895. To a large extent this was a reconstruction from fragments of the old burnt temple found under the later one, and fortunately those fragments were enough to enable the reconstruction to be made without recourse to much conjecture. But there remained over some other fragments of capitals from the same archaic temple. As they lay in the museum room they were almost unintelligible. After much doubting he (Dr. Murray) decided to take certain of them in hand. The author then described the fragments and the ornament upon them, and went on to show, by the aid of lantern slides, how they had been pieced together, the result being a restoration, fairly justified by the remains, of an archaic capital of an entirely new character. One particular feature the author did not think there was any other instance of among the remains of Greek architecture. A fragment of the rim presented on the outer face a double moulding with a sharp groove between. Into this groove had been pushed a thin strip of lead which first had been doubled back. The doubled edge is at the bottom of the groove; at the top the two edges of the lead are brought close together and hold in the manner of a vice a very fine thread of gold. Pliny mentions as still existing in his day at Cyzicus a shrine on which a fine gold thread had been inserted in all the joints of the marble, so that the interstices shone with the finest hair-like threads. Fragments from the capitals show that much red or vermilion had been employed on them. Some leaves show a white edging, others white with red edging.

There remain two fragments from the archaic temple at Ephesus which the author thought must also belong to a capital, though it is not yet clear how they are to be combined into one. One shows the head of an ox in very high relief, the other part of his back and haunch, with the tail thrown up over the haunch, as often seen in archaic Greek sculpture. There is in the museum a huge capital from Cyprus in which the heads and shoulders of two oxen were employed to support the abacus. The author concluded that if he was right in his assumption that these two fragments belonged to capitals, we have thus at least three types of capitals from one and the same archaic Ionic temple. We have also at least three types of bases, and, considering how few are the surviving fragments, no one can say but there may have been other varieties. Pliny says of the later temple that thirty-six of the columns were sculptured. The older temple also had sculptured columns. These enriched columns would be capable of carrying off some variety in the capitals. The moral is that if the architects of the Classical Revival in this country had been aware of the inventiveness of the early Greeks the aspect of our towns would have been very different.

The author concluded by acknowledging his indebtedness to the foreman of the masons and the well-trained men under him in the various restorations and rearrangements that had been made in the museum during the past fifteen years.

In addition to the lantern slides which Dr. Murray showed, some slides in illustration of the subject were shown and described by Mr. Hugh Stannus. Mr. Stannus said he thought that Dr. Murray had fully proved his case. The rosettes they had seen were something very different indeed from anything they had seen in Ionic work. In his opinion the Greeks were not so original as they were selective, and we could find, he thought, a prototype of all the forms they used; but the great charm of their work was that in their selections they kept the grain and threw away the chaff. Many of these columns were the gifts of different kings, and were probably different in design. When the Greeks came to make their perfect Ionic they threw away all the unnecessary features, and kept the best. He desired to move a hearty vote of thanks to Dr. Murray for his very interesting lecture.

Mr. R. Phené Spiers said that with regard to the capitals brought before them by Dr. Murray, particularly that from Ephesus with the [illegible] volutes, they may have noticed that what was called the egg and tongue, instead of projecting forward, receded at the top. It had long been his idea that the egg and tongue was not copied from the painted decoration on the echinus moulding of the Doric capital, but was altogether an original conception derived from the overhanging petals of a flower. The extremely interesting terra-cotta capital from Gela, in Sicily, clearly showed that. The egg and tongue as represented in the centre of the capital from Gela was a long pendent leaf. The capital which Dr. Murray restored some years ago showed to a certain extent the leaves falling back, and there was another capital close by it in the Museum, in which the leaves were carried at the top back underneath the volute-block. It seemed quite evident, looking at this capital and at the other examples, that the egg and tongue was really a representation of the ends of the petals of a flower hanging over. With regard to the capital from Bassæ, in the first publication by the Dilettanti Society no abacus whatever was shown, and in Blouet's work none was given. Looking through Professor Cockerell's drawings the other day, he noticed that in the first drawing the abacus was not indicated, but that in subsequent drawings he seemed to have tried to see how an abacus would come in. He should like to ask Dr. Murray whether there had ever been found any trace of an abacus, or whether it was evolved by Professor Cockerell in order to align with the abacus of the Corinthian capital which placed it in the centre. Professor Cockerell must evidently have felt that some more stable support was required, or he would not have indicated the abacus above it. One would like to hear Dr. Murray's opinion as to how the angle capital of the archaic temple at Ephesus was arranged. As the abacus of the Ionic capital of the Erechtheum was square there was no difficulty whatever; but when, as in the case of the early archaic capitals at Ephesus, the abacus was almost twice as long as its width, it became a very difficult question whether they did attempt at that time to form a canted angle. He had much pleasure in seconding the vote of thanks to Dr. Murray, not only for his paper, but for his long labour in connexion with these pieces of columns which he had put together and described.

Mr. Paul Waterhouse said he desired to ask a question which was an amplification of Mr. Spiers' question about the abacus of the cap with the rosettes. One always had a kind of impression that one of the main differences between Gothic and Classic architecture was that the Gothic architects got projections in their capitals, and that the Classicists did not, and consequently he did not understand the nature of that immense projection on the rosette cap which had been shown, and he would like Dr. Murray to state what the projection was from back to front as compared with the lateral projection—whether it projected forward to any considerable extent or whether it was practically on the same plane as the upper surface of the shaft. He noticed that both the abaci shown were fragmentary and were restored more or less conjecturally, and he would like to know whether Dr. Murray was absolutely certain about the length of the abacus in each case. If it could be proved that the abacus had such an exceptional length, it seemed to him that that would introduce a new element into our ideas and knowledge of classical architecture of a very radical character.

Professor Beresford Pite said would Dr. Murray add the date that he assigned, approximately, to the Temple at Ephesus to which this very interesting restoration applied, and at the same time indicate the relation of the capitals of this date to other known Ionic capitals? It seemed very important that they were able to connect the designer of the Temple of Nikè with the design of the Parthenon. Our conception of Greek work now included a refined and perfect Ionic as being the product of the same hand, the same mind, as the Parthenon, whereas the old idea was that the Parthenon was the refinement of a generation, the cream of a large quantity of work, and that the architecture represented by the Erechtheum and the Temple of Nikè belonged to a different school and chain of ideas. As to the inscription on the tablet referred to by Dr. Murray, which fixed the date and gave the name of the architect, though Dr. Murray indicated a missing link, he (the speaker) should like to take advantage of that and "jump" the conclusion that we have two very interesting illustrations of the work of a highly accomplished Greek architect who had also a share in the work of the Parthenon.

Mr. W. D. Caröe said they had a fair idea of the actual size of the capital from the Temple of Nikè, but not of the other two. Could Dr. Murray give them an idea of the dimensions of the terra-cotta capital and also of the one at Bassæ?

Mr. W. Brindley said the great lesson to be learnt from the illustrations they had seen was the individuality of the different men who executed the work in those early times. There were no set rules. There was as much freedom in early art as there had been in later periods under the different Gothic styles, whereas our Classic work was developed with scarcely any variation. Workers in art ought not to be tied. Throughout the length and breadth of Italy the artists of the Renaissance date worked with the same freedom that characterised early archaic work. It was always very agreeable to hear how Dr. Murray spoke of those who worked under him: he never took the credit to himself.

Mr. E. W. Hudson said he thought it would be a good thing if there could be prepared for the help of students a diagram or chronological list of recovered ancient Ionic capitals which would give an idea of the origin, and of the different steps by which the volute in its most perfect form had been arrived at.

The Chairman, in putting the vote of thanks, said it was certainly most interesting to find that a temple that in one's schooldays was always heard of as the Temple of Athena Nikè, or Wingless Victory, probably took its name not from Nikè, but from the form of the Temple itself. It was quite new to him, and very interesting. What must have struck those who had listened to Dr. Murray was the great pains and care required in attempting any restoration or reconstruction of a piece of work such as that which had been described. Dr. Murray told them how he had been fascinated by the fragments of materials he saw in the Museum, and it was evident that only by great patience and the exercise of much care was he able to reconstruct them and apply them as he had. The rosette capital which he had thrown upon the screen, showed, he understood, no sign of any connexion of the mouldings on the different sides of the capital. He presumed that no pieces had been found which would enable them to say whether there was any connexion between the mouldings on the different sides. With the vote of thanks to Dr. Murray he would include their thanks to Mr. Stannus for bringing his slides there and describing them.

The vote of thanks having been heartily agreed to,

Dr. Murray, in the course of his reply, said the chairman's question indicated a difficulty. They had only a piece of the moulding which ran above the eggs from one side to the other, but how it exactly impinged on the rim of the rosette they did not know nor how the bit under the abacus joined on to the rim of the rosette. The fragment which ran from rosette to rosette immediately above the egg moulding must join with the anthemion in the corner somehow, but how it would work out they did not know yet. As to the Ionic capital of Bassæ, he thought it was quite clear that there must have been an abacus. As to whether, among these archaic Ionic caps an angle volute had been found, he did not know; he did not think one ever had been found, but what had not been found to-day might be found to-morrow. As to the length of the abacus in the rosette capital, it certainly seemed to be excessive, but he thought they might be able to reduce it 2 in., but he did not suppose that would satisfy the architects. As to the projection, there was no question at all. It was on the same plane as the top of the shaft. As to the date, the date of the Temple was perfectly well assured. The columns of the Temple were the gift of Crœsus, and the time of his greatest prosperity was 560; that was the date of the Temple and the two caps. As to contemporary caps, they had a fragment from Samos which Cockerell found, he believed. As to the dimensions, the small terra-cotta cap was merely a model—a thing about 1 ft. in width, but in the new capital from Ephesus the spread from the outer edges of the rosette was 9 ft. 8 in., which was 3 in. in excess of the volutes of the former one and the shaft was certainly greater in diameter by 3 in.

The Chairman announced that the next

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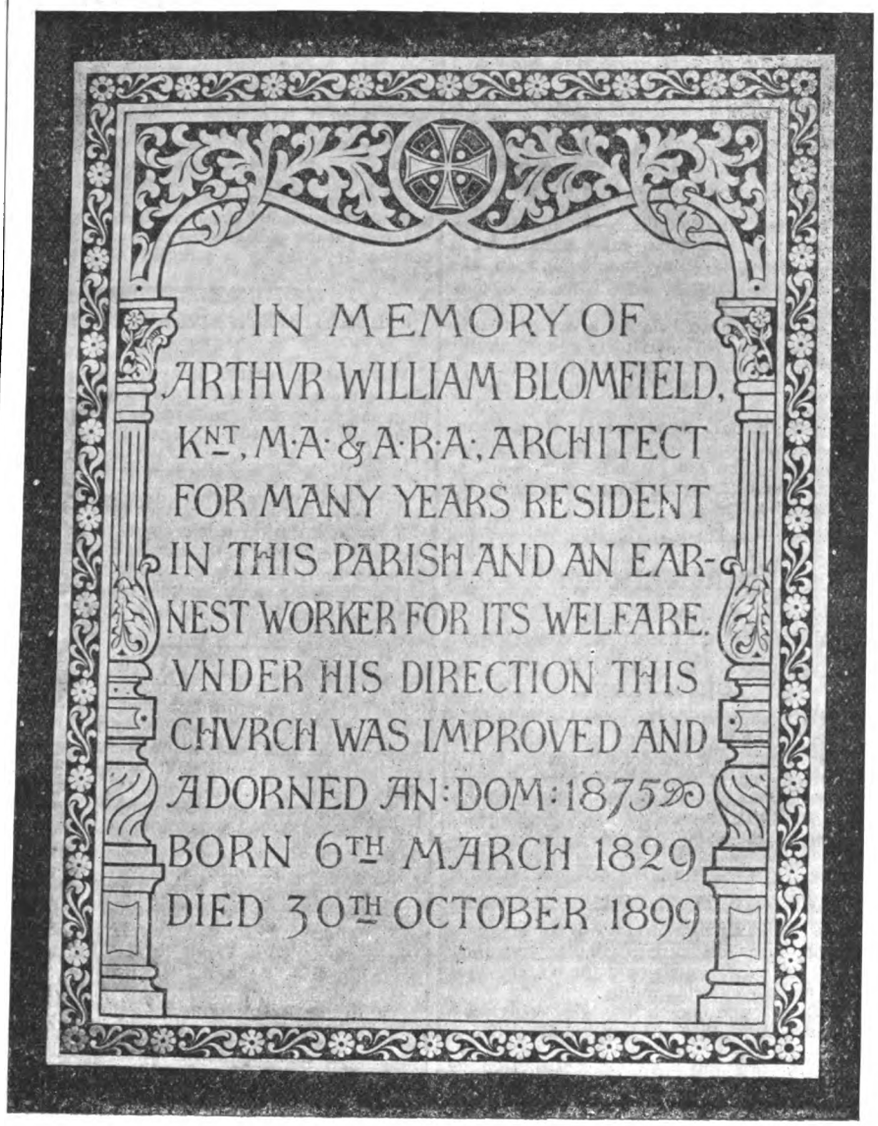
IN MEMORY OF
ARTHVR WILLIAM BLOMFIELD,
KNT, M·A· & A·R·A·, ARCHITECT
FOR MANY YEARS RESIDENT
IN THIS PARISH AND AN EAR-
NEST WORKER FOR ITS WELFARE.
VNDER HIS DIRECTION THIS
CHVRCH WAS IMPROVED AND
ADORNED AN·DOM·1875
BORN 6TH MARCH 1829
DIED 30TH OCTOBER 1899

Memorial Brass to Sir Arthur Blomfield in St. Mary's Church, Bryanston-square.

meeting would be held on the 20th inst., when the award of prizes and studentships would be read, and Mr. Detmar J. Blow would read a paper on "The Architectural Discoveries of 1901 at Stonehenge."

The meeting then terminated.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—At the meeting of the Liverpool Architectural Society (Incorporated) held on Monday, January 6, the President, Professor Simpson referred to the death of Mr. Frederick W. Hornblower, who was for many years hon. secretary to the Society. The paper for the evening was read by Mr. James Parkinson on "Old English Cottages," with special reference to half timber work in the villages of Shropshire and Herefordshire. He pointed out how the lack of adequate tools influenced both construction and design, and showed how much of the best work in the district owed its origin to John Abell, architect and builder, appointed by Royal warrant chief carpenter to Charles II. On Abell's tombstone can still be read a pathetic appeal to

> "They who list and they who wist,
> For he can build no more."

During the paper numerous views, taken by Mr. Parkinson, were shown by a lantern. The legend selected for the Society's new seal is taken from Virgil (Æneid, ii., 15) and runs—

> —"Divinâ Palladis arte
> Ædificate."

CENTRAL LONDON RAILWAY LIFTS.—An English firm, Messrs. Waygood, have been commissioned to carry out some additional lifts required by the Central London Railway; a point worth noting, as the first collection of lifts for this railway were given to American firms.

MEMORIAL BRASS TO SIR ARTHUR BLOMFIELD.

A SMALL memorial brass, of which an illustration is here given, has just been fixed in the Church of St. Mary, Bryanston-square, to the memory of the late Sir Arthur Blomfield. It is erected, in this his parish church, by some of his fellow-workers in the parish, among whom his valuable help and personal charm will long be remembered. The church was reseated and decorated some twenty-five years ago under Sir Arthur's guidance, and has lately been further remodelled by his eldest son. The brass was designed by Mr. J. D. Crace and executed by Messrs. Hart, Son, & Peard.

ENGINEERING SOCIETIES.

INSTITUTION OF JUNIOR ENGINEERS.—At the meeting of this Institution, held on January 3, at the Westminster Palace Hotel, the Chairman, Mr. Percival Marshall, presiding, a paper on "The Utilisation of Exhaust Steam" was read by Mr. John Buley. In introducing the subject, the author criticised the several methods adopted with the view to disposing of the lime scale deposit on the tubes of evaporative condensers, and suggested that in many cases it would be feasible to overcome the difficulty by periodically circulating a dilute solution of hydrochloric acid over the fouled surfaces. Special attention was directed to the employment of exhaust steam for heating circulations, and for hot-water supplies for hospitals and asylums, and also its utlilisation by equivalent methods for raising the temperature of the water delivered to the ponds in public baths and wash-houses. An interesting illustration was given in which the exhaust steam from a 7½-in. by 6-in. duplex pump was utilised for heating the day-rooms of an asylum, where the cubical content was 54,864 ft.; with an external temperature of 37 deg. Fahr., with ample provision for ventilation, an internal mean temperature of 63 deg. Fahr. was maintained. Reference was made to the relative merits of direct heating, and inducing the flow of exhaust steam throughout a main circuit by means of an air-pump, as against the adoption of a central heater through which low-pressure water would have an accelerated circulation derived from an ordinary plunger pump. Where a complex system over a widespread area was a necessity, the latter system was advisable on the score of efficiency, first cost, and the general up-keep. Where exhaust steam was utilised for the concentration of liquors, the writer advocated the "Lille" system as the one from which perhaps the most favourable results had been obtained. With it an efficiency so high had been reached as to evaporate 40 lbs. of liquid per pound of coal. The direct return of condensation water to steam boilers was not commended, on account of the liability of intermittent shocks occurring. The writer considered that in practice trapping was the most satisfactory arrangement, and in spite of the disadvantages that sometimes attended the working of steam-traps, it was best to adopt this method of drainage, and to depend upon the condensation being returned to the boilers from a central hot-well, into which all the discharges should be led. The trap that relied for its action upon the concentration of the vapours of surplus heat was the one commended, rather than that on the expansion principle, by reason of the extreme fluctuations of pressure and consequent temperature where steam was employed in such a way as to bring about heavy spasmodic demands.

SANITARY INSPECTORS' ASSOCIATION.

AN extraordinary general meeting of the Sanitary Inspectors' Association was held on Saturday evening at Carpenters' Hall, London Wall, City. Sir James Crichton Browne presided, and was supported by Sir H. Gilzean Reid, the ex-President.

Sir James Crichton Browne, as President, contributed a New Year's address in which he said that their Association was increasing in numbers, improving in quality, and steadily rising in public estimation. It was, therefore, more potent in safeguarding the interests of its members and in advancing those beneficient objects and aims that it had persistently held in view. They could scarcely escape the influence of the Imperial ideal that was in the air, and if they were to attain to full strength and usefulness they must become a truly national society. They should receive into their pale all who were engaged in the work of sanitary inspection in every part of the kingdom, and while allowing to local branches a reasonable autonomy, should unify and co-ordinate these in a central authority. It was of great importance that they should perfect their organisation as soon as possible, because, if he read the signs of the times aright, a great sanitary upheaval — for which they should be prepared — are certain to occur very shortly. On all hands he saw signs of awakening on sanitary subjects. A somnolent public, hitherto only startled occasionally into a transient interest in health questions when some big epidemic wave swept across the land, was now permanently aroused to their significance. It began to realise what the sanitary reforms of the past, achieved in the face of so many difficulties, had done for it in the reduction of the death-rate; to grasp the truth that it was still grievously loaded with an altogether unnecessary burden of disease; and it began to bestir itself. And surely it was high time that public attention was concentrated on those preventable diseases, not yet prevented, which caused such widespread misery! London was again suffering from a visitation of smallpox, after practical freedom from it for a number of years. It was well calculated to create anxiety, for it had been creeping onwards week by week, and if the present epidemic pursued the usual course, it would reach its highest level between January and May. It was consolatory, however, to remember that never before had London possessed means at all approaching in adequacy to those it was now employing against the variolus invasion, and

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never before had the whole country been so much on the alert, or so well prepared to resist its advances. During the prevalence of the epidemic in any locality the staff of sanitary inspectors should be increased, so that house-to-house visitation might take place. The precautions which devolved on the local authorities when notification had taken place and isolation had been effected, and in which they, as sanitary inspectors, were immediately interested, were of the usual kind, but should be carried out with special scrupulosity where smallpox was concerned. They consisted in free ventilation by open windows, in disinfection of rooms by formic-aldehyde vapour, in the burning of all soiled linen, in the saturation of sheets and garments in a strong corrosive sublimate solution, and in cases in which the eruption had appeared before notification had been made, in the smearing of the body with vaseline or olive oil before removal was undertaken.

He had spoken of smallpox on the suggestion of Mr. Tidman, their Secretary, putting aside for the present his own inclination, which was to discourse on the housing question—that most pressing of all the social problems of the day—or on a mere adjunct to it, the circum-housing question or the sanitary supervision of the curtilage of town dwellings, a topic deserving of serious examination. A number of years ago he made notes for a lecture on the back yards of London, but, like many other projected swift cruisers of his, that lecture was still on the slips; but none the less he felt sure that a careful study of the back yards of our towns and cities, and of the surface conditions of courts, alleys, and streets, would throw light on some social obscurities and help them in their sanitary campaign. The fronts of the houses in the mean streets of our working-class quarters, which, in their long drawn out squalid sameness, and in their endless repetition of door knockers and window blinds, where these existed, of exactly the same pattern, seemed to Ruskin, as seen in the south-eastern suburb of Bradford, the most frightful thing he had ever witnessed—suggested a dead level of wholesale indifference and imbecility—but the back yards of these same houses revealed a rich variety of human tastes, interest, predilections, and aspirations—individualism ranging from æsthetic refinement to hideous degradation. In the glimpses we obtained of them from the railway train as we passed from the centre through the suburbs of London, we observed in one a pretty and well-tended flower garden, in another a juvenile menagerie, and in still another a pile of pots-herds and debris. Over one floated the Union Jack from the top of a rigged mast, in another stood an oyster shell grotto, and in another was a measly grass patch bordered with pale-faced lettuces and sickly scarlet runners. Apart from these characteristics, he wished to draw their attention to the fact that in a very large proportion of these yards the ground enclosed was sodden and saturated with decaying organic matter. Our people were, on the whole, the most cleanly on the face of the earth, when they had a chance of being so; but still the ground of the backyards of their houses had, in many instances, become impregnated with organic refuse to an objectionable degree. The absence of the back yards marked the lowest point in insanitary habitations, as in those abominable back-to-back houses, of which Mr. Rowntree said there were still 1,396 in the city of York; and the next worst arrangement was the court, shared in common by a considerable number of houses built round it; unpaved, partly paved or cobbled, often full of holes, waterlogged, and reeking with filth. The backyard connoted emergence into a higher domiciliary sphere. It was a precious possession, the recreation ground of a family on a summer's evening, a breathing space, a field for the cultivation of hobbies, which should be jealously preserved; and therefore he was anxious that they should secure its wholesome condition, seeing, wherever they were entitled to do so, that it was paved or cemented for a certain distance from the dwelling, was kept swept and garnished, and was not sickened by an excess of excremental and waste matter thrown upon it, or converted into a cemetery by the interment of dead pets. For they as sanitary inspectors were the tutelar genii of the homes of the poor, and must include the backyards in their guardianship. In their anxious and arduous work they were sustained by the sights of the benefits immediately accruing from their labours, and by a vision of the greater good flowing from them that would be revealed hereafter. They were incessantly warring against two great curses of the age—dirt and pessimism—the one destroying the body and the other the soul. It was with dirt in its manifold epigenesis in these huddling days, in its nakedness unashamed, in its fantastic disguises, that they were primarily concerned; but in removing dirt they were lightening the discontent and despair that so often went with it. With sympathy, imagination, and worthy ideals before them—without some endowment of these no man should be a sanitary inspector—they would find in the faithful performance of their work an exceedingly great reward.

Sir H. Gilzean Reid moved a vote of thanks to the President for his timely and admirable address to the Association and the public.

Mr. Tidman formally seconded the resolution.

Mr. Grigg, Mr. Young, and others gave their experience in dealing with smallpox, and the resolution was carried.

After dealing with private business the meeting adjourned.

Illustrations.

LIVERPOOL TECHNICAL SCHOOL: DETAIL OF PORTION OF SOUTH FRONT.

THIS represents the detail of a portion of the fine building for the Liverpool Technical School, by Mr. E. W. Mountford, and is reproduced from a drawing made from the executed work. The sculpture is by Mr. F. W. Pomeroy. The drawing was exhibited at the last Royal Academy Exhibition.

NEW TOWN HALL, MARLBOROUGH.

THIS building, which is still in course of erection, was designed to provide accommodation for Quarter Sessions, for borough purposes, and for entertainments.

On the ground floor is the first court (to be used also for small meetings) and a council chamber. The greater part of the first floor is occupied by an assembly room, 76 ft. long by 37 ft. wide, furnished with movable fittings for a Sessions Court. The committee and retiring rooms are also on the same floor.

The basement provides cells for prisoners, heating-chamber, and a muniment-room, &c.

The elevations are of red brick, with Ham Hill stone dressings, and above the level of the first floor it is covered with rough-cast, the angles being accentuated by rusticated quoins. The roof will be covered with plain tiles.

The builder is Mr. B. Hillier, Marlborough, and Mr. A. A. Ellis is acting as clerk of works. The heating arrangements are being carried out by Messrs. Haden & Sons, Trowbridge.

The architect is Mr. C. E. Ponting, Marlborough, and the drawing was exhibited at the Royal Academy last year.

We regret that, owing to Mr. Ponting's absence from home, we have not been able to obtain from him a plan of the building in time for publication.

DESIGN FOR A TOWN HALL FOR A LONDON BOROUGH.

THIS design, by Mr. F. W. Newman, was one of the best of those sent in for the Royal Academy Gold Medal and Travelling Studentship in Architecture, the prize design for which we published last week. We believe this design ran the prize one pretty close, and in purely architectural treatment we are inclined to prefer it; the curved loggia on each side of the entrance is a very good idea; the very plain mass of wall above it and in the vestibule block is out of keeping with the rest of the design, though we know that it is a kind of point in fashion with the younger school of architectural designers at present. The internal areas for light are too small, though we observe that they are only used to light corridors and lavatories. But in the main this strikes us as a very pleasing and meritorious design.

The author sends us the following statement of his aim and intention in the design:—

"The conditions governing the design, required a 'Town Hall' for a London borough.

I had imagined the site to be on the borders of a London park, and in working out the design I had endeavoured to get, in the first place, a good hall, which would to a great extent govern the whole design, so that the building would not be mistaken for a block of municipal offices only.

The Town Hall is arranged on the ground floor, easy of access and egress, and separate from the municipal portion of the building, so that it could be used without disturbing the working of the council chamber or of the municipal offices.

The latter are arranged on the ground and second floors, with additional rooms in the basement. The whole of the first floor being used solely for committee-rooms, council chamber, Mayor's rooms, &c.

Access for the public to the gallery of the council chamber, by way of a staircase next to Rates office."

"LYNDHURST," WESTON-SUPER-MARE.

WE have not received any information from the architect in regard to this house; but the plan and perspective sufficiently explain themselves as far as the general design is concerned.

A COUNTRY RESIDENCE.

THIS is a design made some years ago by the architect, Mr. A. W. Cooksey, for a house for a site near Matlock, Derbyshire.

The drawing was exhibited in the Royal Academy Architecture Room in 1892.

THE ARCHITECTURAL ASSOCIATION.

ON Friday evening last week an ordinary fortnightly meeting of the Architectural Association was held in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., Mr. W. H. Seth-Smith, President, in the chair.

The minutes and some nominations having been read, Messrs. A. D. Thacker and G. M. Page were elected members.

It was announced that a meeting of the Discussion Section would be held on the 10th inst., when Mr. P. W. Mulready will read a paper on "The Work and Influence of Augustus Welby Pugin."

New Premises Fund.

The Chairman then announced the following additions to the subscriptions received for the new premises, *i.e.*, Messrs. T. G. Jackson, 50*l.*; F. T. Baggallay, 31*l.* 10s.; A. Saxon Snell, 25*l.* 5s.; E. J. May, 21*l.*; R. A. Briggs, 12*l.* 12s.; S. Flint Clarkson, 10*l.* 10s.; H. J. Blanc, 10*l.*; G. B. Carvill, 5*l.* 5s.; C. Harston, 5*l.* 5s.; T. H. Russell, 5*l.* 5s.; E. Howley Sim, 5*l.* 5s.; B. H. Webb, 5*l.* 5s.; E. R. Chambers, 5*l.*; A. Hill, 5*l.*; H. S. Noblett, 5*l.*; A. H. Belcher, 3*l.* 3s.; W. Stewart, 3*l.* 3s.; W. L. Lucas, 2*l.*; C. M. Armstrong, 1*l.* 1s.; W. J. Devlin, 1*l.* 1s.; A. S. Taylor, 1*l.* 1s.; and J. T. Woodow, 1*l.* 1s. The total amount so far promised or received is 3,448*l.*

The Chairman said the response to the appeal on behalf of the Fund had, on the whole, been satisfactory. At a previous meeting he urged members not to be backward in giving small sums if they were not in a position to give large amounts. The Committee wanted to know that they had the sympathy of the members in the matter and to feel that the whole Association was with them in the enterprise; and the feeling of the members would, to some extent, be gauged by the donations. Members who were in a position to give small sums should not be discouraged by seeing in print large donations to the Fund; they should put down their names for what they felt they could afford. He might add that the Committee had not received all the money promised, but they were putting the money they did receive into a separate fund, and it was in no way mixed up with the general funds of the Association. The money received, which was earning interest all the time, was being kept absolutely distinct for the purpose of providing new premises for the Association.

The Day School.

The Chairman also announced that the Spring Term of the Day School would commence on the 13th inst. The school so far had been an absolute success, and those who were present at the closing meeting of the School, when some drawings by the students were shown by the headmaster, would have been delighted by the work already done in three months. Nothing could have been more satisfactory than the result of the work so far.

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The Development of Domestic Architecture in England.

The Chairman, in calling on Mr. J. A. Gotch to read a paper on "The Development of Domestic Architecture in England from the Twelfth to the Eighteenth Century," illustrated by a large number of lantern views, said the Institute of Architects intended to help the Association to obtain a suitable sheet and another lantern, so that in future they would not be dependent on the oxy-hydrogen gas.

Mr. Gotch then read the following paper :—

The subject is large ; so large that one half of it has filled the four portly volumes of Messrs. Turner and Parker on the "Domestic Architecture of the Middle Ages," and as that work would take, on a moderate computation, four-and-twenty hours to read aloud to you, without any interval for rest or refreshment, it is quite obvious that the view which we take this evening of the subject must be cursory and confined to but a small part of the whole range of research.

It will be impossible to enter into minute details of style, decoration, and fittings, but it may be of interest to show, by means of plans and views, how the stately homes of England grew from their small beginnings, and what were the most important influences which affected their disposition and their appearance. We are accustomed to take the memorable houses of the country very much for granted, each one being characteristic of its own period. What I want to do is to show, if only by glimpses, how these great houses grew, and what relation they bear one to another.

In the present day we should classify the accommodation of a house in three main divisions: the reception-rooms, the bedrooms, and the kitchens or servants' quarters. Going back to the times of the early Georges, the same classification holds good, but the bedrooms were less important, and the reception-rooms much more so. Still further back, in Elizabeth's days, the same division is applicable, but we find the chief apartment among the reception-rooms to be the great hall. The bedrooms were largely left to take care of themselves. In all three periods the kitchen department is fairly commodious. But if we go back to the thirteenth or, further, to the twelfth century, the bedrooms practically disappear, and only the reception-rooms and the kitchens remain. Indeed, when we reach these primitive times it becomes necessary to alter our classification somewhat. There are still three kinds of rooms, but they consist of hall, solar, and kitchens, the solar being the private apartment of the master, or, to use a more appropriate word, the lord. These three rooms are the nucleus from which grew the vast mansions of Elizabeth and Anne ; and the development of domestic architecture consists largely of the development of this one single apartment for the lord into the separate apartments which are now provided for each of his household.

There is this initial difficulty in investigating the houses of the early Middle Ages—that most of them have disappeared. They were, as a rule, built of wood and plaster, only some of the more important being of durable materials. Those which have survived have suffered so many alterations in the course of their existence that their original arrangements are not always to be made out. Nevertheless, from such remains as survive, and from the rare references to such matters as have come down to us in contemporary writings, it is quite clear that houses consisted of, first and foremost, a hall, then at one end the solar or sollere (as it is also called), and at the other the kitchen with its subsidiary apartments. Writing about the year 1180, one Necham, who rose from being the master of the grammar school at St. Alban's to being Abbot of Cirencester, enumerates the apartments of a house as consisting of the hall, a private or bed chamber, the kitchen, larder, sewery, and cellar.

The houses of that time were comparatively limited in number. There were the King's houses, of which he had a good many in different parts of the country, the houses of the great barons, and the manor-houses. Besides these there were the great religious establishments, which, however, had their own special arrangements, hardly falling within the scope of this paper.

Many of the great barons lived in highly fortified houses, which we call castles, some of which were actually military strongholds. In the case of others it is not easy to draw a distinct line between the castle and the house, for they were all more or less fortified. But at present it is not the military strongholds which are under consideration, but those dwellings which were only fortified in order to secure their inhabitants. Such a house was the Peak Castle, in Derbyshire, which was built on a steep hillside on a triangular piece of land, protected on one side by one of the numerous and precipitous dales for which Derbyshire is famous, on a second side by the sheer descent of the gorge into which the Peak Cavern opens, and on the third by the steep hillside, at the top of which was the outer wall of the castle. The dwelling part of the castle was the keep or tower, the ruins of which still crown the summit of the isolated piece of land. This keep resembles the pele towers of the Scottish Border, many of which still remain both in Northumberland and in the Lowlands of Scotland. It is a square tower of three or four stories, each floor containing one room. The basement was a cellar ; the floor above it contained the hall ; over the hall was the lord's private apartment. This arrangement is very primitive, and represents what must have been the minimum in the way of accommodation which was tolerated. This vertical disposition of rooms, one over the other, soon gave way to a disposition which placed most of them on the ground floor, or if they were not on the ground floor they were spread out into a form less rigidly vertical.

Whatever arrangement was adopted, however, the hall was the chief apartment. It was the largest, the most permanent, and the most central. It was, in fact, the dwelling-place of the household and became synonymous with the house itself, which was in most parishes known as "The Hall." In this apartment the whole household lived, ate, and slept; all save the lord and, possibly, his family, who had a separate room into which they could retire, already mentioned as the solar. The solar appears to have been almost always an upper chamber, built over an apartment which was often used as a store place ; but there are so few remains of these very early houses that the exact arrangements can hardly be made out with certainty. The solar seems to have been approached in many cases by an outside staircase. But, at any rate, this much is clear, that the hall stood in the middle, between the solar and the kitchen, the latter being the third of the three main classes of rooms which these early houses contained. The cooking was not done in the hall, but in a separate building devoted to the purpose, attached to which were a few subsidiary rooms such as the larder, where the food was kept ; the sewery, where provisions, linen, and table furniture were stored ; the cellar, which was used for general stores and wine ; and the buttery, where the drink was distributed. These smaller rooms were not always provided; their presence depended on the importance and size of the house ; but there were always and in every house the three divisions of hall, solar, and kitchen, the hall lying between the other two. The arrangement of the hall was simple, and remained the same in principle from the earliest times down to the seventeenth century. It then underwent a change which marked a complete revolution in domestic architecture, and which will be described in due course.

The hall, lying, as already said, between the solar at the upper end and the kitchen at the lower, was entered, close to the latter, by a door in its side wall. Through the lower end wall were doors leading to the kitchen department, sometimes two, sometimes three. Of these, one opened into the buttery, one into the kitchen or kitchen passage, and the third (if there were a third) into the pantry. There was usually a screen stretching across the hall to keep off the draught from the open door, and more particularly to screen off the kitchen traffic, for draughts would still come through the windows, which were seldom glazed in early times. There were doors (generally two) through the screen into the hall itself, and there was a ceiling to the passage cut off by the screen, which formed a gallery usually known as the minstrel's gallery, although it is tolerably certain that very few of the ordinary households could have supported a private band. At the end of the hall, away from the screen, was the dais, which was a raised platform some few inches high, whereon the lord and his family and principal guests sat to dine. In this upper end of the hall was a doorway leading more or less directly into the solar. Both the solar and the kitchens were sometimes built of wood, as were also many of the subsidiary apartments. Such fragile buildings have disappeared, leaving in some cases little besides the hall to tell of the former extent of the house. This may have been the case at Oakham Castle, where the hall alone remains of the building erected about the year 1180 by Walkelin de Ferrers. But this hall is an extremely fine example of its kind ; it is of considerable width, and the roof is carried in three spans, one over a central nave, and the other two in the shape of a lean-to against it—an arrangement similar to that adopted in churches, and serving to remind us of the similarity of treatment adopted in both ecclesiastical and domestic buildings. The windows are small and low down, and they have, in common with the doorway, the characteristics that distinguish the transition from Norman to Early English. The interior might well be taken for that of a church, with nave and aisles, but the position of the doorways in the end walls, the treatment of the windows on the inside, as well as the absence of any indication of a chancel, would put the wary inquirer on his guard. The hall stands alone, the solar and kitchens—which must have existed—having disappeared. It may be that they were burnt, for accidents of that kind happened not infrequently. One, indeed, happened in 1182, two years after this hall at Oakham was built, to no less a person than Abbot Samson of Bury St. Edmunds, who, we are told, was nearly burnt to death in his solar, the only door being locked, and his Early English windows being too narrow to admit of his getting through them.

If not burnt down these rooms may have been blown down, as were the royal kitchens at Oxford in the seventeenth year of Henry III.

It seems quite clear from these and other specific references that many of the subsidiary rooms were built of wood, although the hall was of more durable materials. Its permanent character arose from the nature of its use. It was the sheltering place of the whole household. Temporary kitchens might be, and sometimes actually were erected, so might a temporary bedroom. But in the hall the family and its retainers ate and slept ; in it also the lord held his courts and received those who came to see him on matters of pleasure, of business, or of strife.

Personal comfort was not much studied in those days ; men were content to sleep where they could, and when there was no room in the hall they sought, without reluctance, the equally refined shelter of the stable. There was no indignity put upon Ivanhoe in sending him to the stable ; his fellow-knights often shared his fate in this respect. A little after his time we learn that Henry III. ordered the wood cellar at Clarendon to be fitted up as a chamber for the knights in attendance on him. As they were not particular about their beds, so also they had simpler views than we have about the heating of their rooms. In some houses only the solar had a fireplace, the hall was heated by a fire in its midst, the smoke finding its way out of a louvre on the roof. Here and there the hall had a fireplace of its own. The smoke from the central fire found other vents than the louvre, for but few of the windows were glazed ; wooden shutters served to keep out the weather. In some grand houses the part above the transome was glazed, while that below retained its shutters. But people were susceptible to draughts even in those hardy days, for Henry III. directed a window in the Queen's room in the Tower to be glazed, "so that the chamber might not be so windy."

It was in his reign, too, that the practice of wainscotting rooms—that is, lining the walls or the roof with wood—was introduced, and there are several instances in which he ordered a certain number of bays of a roof to be wainscotted, presumably in order to keep the draught from his own head and those of his principal guests.

But I must not enter too much into details : these matters have been mentioned rather with the view of showing how small an amount of what we call comfort was expected in those days, and how, therefore, it is not surprising

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that very few rooms satisfied the domestic needs of the times.

At Stokesay, which was built in the thirteenth century, the main dispositions conform to the usual type. There is the large hall entered at the end of one of its sides. At its upper end is a door which eventually gave access to an outside staircase leading to the solar. At its lower end is a cellar, over which is an apartment with a fireplace. This room was reached by a staircase in the hall, standing in what would ordinarily be the screens. Of the kitchen there do not appear to be any remains. Beyond the upper end of the hall is a tower which was used for defensive purposes, upon the particulars of which it is not now needful to dwell. The details of the work are characteristic of the thirteenth century. The hall windows are of two pointed lights surmounted by a circle. The lights, which are divided horizontally by a transome, were provided with shutters, but the circle was apparently always open for the winds of heaven to blow through, and doubtless it was through them that most of the smoke from the central hearth escaped.

Yanwath or Yanwith Hall, in Westmorland, was built early in the fourteenth century, but underwent considerable alterations in the sixteenth. The same arrangement was adopted here as in the former examples. The great hall was approached through a passage, which was enclosed by a stone wall on both sides instead of having one side formed by the wood screen of the hall. On the left of the passage was the kitchen, on the right was the hall. The hall itself had a fireplace instead of a central hearth, and this fireplace was at the lower end of the hall. In later times it was more usually placed near the lord's end. There is also a bay window, a feature which became subsequently of universal adoption. The solar, in this instance, is developed into several rooms, situated in a tower, and exhibiting the usual characteristics of the accommodation of a pele tower, namely, one fair-sized room on each floor surrounded by thick walls, in which are contrived various diminutive apartments, access being obtained from floor to floor by means of a narrow newel staircase.

In addition to the usual accommodation which has hitherto been mentioned, Yanwath had a number of other rooms arranged so as to form an enclosed courtyard, one side of which has, however, disappeared. The entrance to this courtyard was through a gateway nearly opposite to the hall door. This courtyard idea, which arose from the necessity for defence, lingered on, as we shall see, for reasons of appearance, long after the need for defence had ceased.

At Sutton Courtney, in Berkshire, is a house, built about the middle of the fourteenth century, in which the usual disposition of rooms is again found. The hall is entered at one end through the screens, and the roof is made to agree with the framing of the screen itself. At the lower end is a doorway which led to the kitchens, at the upper end is a wing, which contained the solar on the first floor, reached by an external covered staircase. There is no bay window, but it is worthy of note that below the main window at the dais end is a low side window, probably contrived for the pleasure of the occupants of the dais. In later times, while the hall windows were almost invariably high up from the floor, the bay window of the dais was equally invariably brought down low enough to afford an outlook. The lofty hall roof still remains (or remained when Turner and Parker wrote) and the general character of the work led to the hall being called the chapel, another illustration of the wide-spread, but fallacious, notion that Gothic forms must of necessity indicate a religious edifice.

The hall itself was usually a lofty building, with an open timbered roof. It divided the house into two separate halves, which, if they were of two stories, had to have their own separate staircases. The walls of the hall were often plastered, and for ornament they were hung with the spoils of the chase, or else with pikes, guns, and bows, with old swords and bucklers that had borne many shrewd blows. A good example is to be seen at Cothele, in Cornwall, and also at Haddon Hall, where the fifteenth-century wood screen still remains.

Haddon is a fine example of a large fifteenth century house built round two courts, and still exhibiting a considerable desire for defence. The hall, as was usual in double-courted houses, was placed in a wing between the two courts, thus being in the most central and best protected position. It was flanked, according to the usual custom, at one end by the buttery, pantry, and kitchen, and at the other by the family apartments, hitherto confined to the solar, but now developing into the parlour and other rooms, including a number of separate bedrooms. This plan of Haddon shows the great chamber and the long gallery, but it should be remembered that the Great Chamber was probably not so called prior to the sixteenth century, while the long gallery was contrived over the walls of a number of earlier rooms, towards the close of that century. The kitchens here are much more elaborate than in any of the previous examples, and they go to show that the wants of a large household and a hospitable lord were both great and permanent, and not so liable as in ancient days to interruption from hostile visitors.

The possibility of such interruptions was never absent from the minds of the builders of those days. Houses were nearly always surrounded by a moat where the nature of the ground permitted it. The entrance gateways still followed in many cases the ancient fashion of placing an archway between two towers. The courtyard plan still held the field in houses of any pretensions. As the years went on the character of the ornament changed just as it changed in churches. The tracery disappeared from the windows, which became flatheaded; doorways likewise became less aspiring, and assumed the obtuse angle of the Tudors. Fan tracery made its appearance in various places, such as the ceilings of bay windows and porches; circular stairs were placed in turrets, which were carried up above the main block of the building, and crowned with lead cupolas. The splendid brick chimneys of Henry VII. made their appearance, with all their intricacy of cut and moulded brickwork.

Then came the Italian influence, which first made itself felt in unimportant ornament, and then spread to shaping the building itself, reducing it to symmetry so far as the exterior was concerned, but leaving the interior still to be arranged after the old fashion.

It brought also that exotic feature, the loggia, or open arcade, which, however, never obtained a really firm footing in English houses. Indeed, all through the sixteenth century and the first quarter of the seventeenth, the new Italian influence never overmastered the old irregular English habits. But under the accomplished Inigo Jones, as we shall presently see, symmetry, which had hitherto been kept to the outside of the house, invaded the inside as well.

However much the character of the ornament may have varied, the character of the plan moved but slowly and always in one direction. Haddon and Apethorpe, two large houses, have shown how the old type grew at its two ends, the hall remaining as of old, but the kitchen and the private apartments undergoing considerable increase and development. On a smaller scale Canons Ashby tells the same story. So do the plans of Elizabeth's time, such as Cannons on a small scale and Kirby on a large scale, both taken from Thorpe's book. In looking at these plans it is obvious that the old idea is still the foundation of the arrangements, although in a great place like Kirby the accessory apartments have become vastly multiplied, and all thought of defence has been abandoned. Houses are no longer built for safety, but for show. Windows which once were sparingly introduced into the outside walls, that is, the walls looking out on to the country, are now used without restraint, and are regarded quite as much from the point of view of how they will help the composition of the design, as from that of usefulness in lighting the rooms. Cheerfulness, splendour, comfort (of a kind), these are the qualities now sought after. The hall had long ceased to be used as a sleeping apartment; when the family and servants retired to rest, it was left to Puck and the fairies, to Oberon and Titania and their train, who

> Through the house give glimmering light
> By the dead and drowsy fire.

It was not always used even as an eating place, at least by the master and mistress and their family, for many families had already sought a smaller and snugger room for their meals, where they could enjoy more comfort and privacy. Not only had the ancient solar developed into the parlour, but the parlour had been developed into the summer parlour, the winter parlour, and the dining parlour. It was no longer on the upper floors, but close to the hall on the ground floor. It was no longer the only bedroom, for bedrooms had been indefinitely multiplied, and, under the name of "lodging," fill up any space in old plans to which no more fitting name could be given. The solar had still further developed. In addition to the parlours on the ground floor, there had arisen the great chamber on the upper floor, and the long gallery—that feature peculiar to Elizabethan houses.

The finishing and embellishment of these rooms had developed along with their number. In the days of Henry III. we hear of plastered walls, and wainscotted walls and roof, but the rooms were extremely draughty, and the smoke from the central fires must have been almost intolerable; there was, indeed, no great inducement to abolish draughts so long as the smoke hung about the room. But the discomfort of draughts and smoke gradually told, even on the iron constitutions of mediæval knights, and by degrees fireplaces with a special flue for the smoke grew more common, and the smaller rooms were furnished with them. Draughts were excluded by filling the windows with glass, and later by plastering the ceilings as well as the walls. Indeed, the ceilings were plastered more frequently than the walls, which were usually covered either with tapestry or with pannelling. The plaster on the ceilings was not kept plain, as it usually is in our days, but was worked into an infinite variety of ornamental patterns. Indeed, by the period at which our story has now arrived, the fitting up of rooms had reached a point of development beyond which we have not gone very far. We have introduced a number of refinements in detail, but, with the exclusion of the weather, the furnishing of a means of heating, and the embellishment of the walls and ceiling, our ancestors of Elizabeth's time had really surmounted the chief difficulties of making an individual room pleasant. Its relation to the general scheme of the house is another matter.

Down to the end of the sixteenth century, and, indeed, as far as the first quarter of the seventeenth, the old type of house plan was still used—the old type which had prevailed in the days of the Norman kings. It is true that the ancient idea had been greatly developed: the kitchen department had been so much enlarged as sometimes to require a court to itself. The single private room, the solar, had been multiplied into several parlours, the great chamber, the long gallery, and many "lodgings" or bedrooms. But the hall still remained the centre of household life, and the dais, which indicates its use as a living room, is shown on nearly all the plans in Thorpe's book. This enormous development of household convenience and comfort would, of course, have been impossible had the first idea of the builders been, as of old, to secure safety; but it was not, and as the certainty increased that a man need not depend upon his own efforts to preserve his security, but the public authorities, so he found more leisure to attend to his comfort, and for securing greater privacy for himself and the members of his household. The great hall began to feel the influence of this change; it had long ceased to be used as a sleeping apartment, and now it ceased to be used for meals. The family withdrew at one end, the servants at the other, and it became merely a vestibule. Concurrently with this change of use there went a change of idea in planning. The symmetrical disposition of houses which the Italian influence produced demanded that the hall should be central. Long-established custom demanded an entrance at one end of the hall, in the "screens," which, therefore, could not be in the centre of the façade. There are a number of examples, both in Thorpe's plans and in actual houses, of how these difficulties were surmounted. But when the hall was no longer wanted as a living room, there was no longer need for the entrance to be in its old position at the end, and the imperious demands of symmetry were satisfied by placing the hall in the centre of the façade and the entrance door in the centre of the hall. This point is curiously illustrated by comparing Thorpe's plan of Aston Hall with that of the house as built. Thorpe shows the door in the old-fashioned situation at the end; it was actually built in the centre, and the hall here definitely ceased to be a living-room and

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became a vestibule. This change is a momentous one, it brings us out of the mediæval idea into the modern.

But although at Aston the plan shows a new departure so far as the hall is concerned, it still follows the old lines in its general grouping, and so does the external appearance. The triumph of foreign fashions over native was, however, near at hand, and it was Inigo Jones who brought it about. At Raynham Hall the plan is no longer founded on the old type. The hall is not the chief apartment, with the family at one end and the servants at the other. The latter have descended into a basement, and the whole ground floor is occupied by family rooms. Traces of the old fashions remain in the projecting wings and in the gables with which they are roofed. But in Coleshill, another house of Inigo Jones, the foreign influence is even more marked, the plan is still more symmetrical, the elevations are still more Classic. In neither house are the windows mullioned: they have sashes, and the change from mullions to sashes marks the final disappearance of the last traces of Mediæval treatment.

The lesson in foreign fashions which Jones gave his countrymen were continued by Wren, and bettered by his successors in the eighteenth century. At Raynham and Coleshill one cannot help thinking that the snugness of home is sacrificed to the demands of stateliness; but at Blackheath and Keddlestone it is lost altogether, and the inhabitants of those great houses must daily pay a penalty inflicted by grandeur. The component parts of the house are divided into separate blocks with tiresome corridors of communication. The great houses of the eighteenth century make a brave show, but they exhibit a profound scorn for the small amenities of household life. They were built in an artificial age, and like the huge wigs which their builders wore as an indispensable part of their costume, they were intended rather for the admiration of the beholder than the comfort of the owner.

But the pursuit of comfort, which was the propelling force in all the changes of domestic architecture which we have been tracing, although it was neglected by the great in the days of Anne and the Georges, was still followed by persons of humbler ambitions, and in the smaller houses of the eighteenth century there is much that is admirable. Much skill and care was expended upon their internal embellishment, and the woodwork of that period is always worth our careful study. This is not the occasion upon which to enter on a minute description of the respects in which it differed from that of Elizabeth's time, this only need be said, that it followed the general tendency of domestic architecture in adopting largeness of scale and dropping minuteness of parts. The two examples from Wilton House and the Brewers' Hall will be sufficient to indicate the change of treatment.

This long story must now come to an end. It has not dwelt much on details, it has rather sought to show by means of actual illustrations, as distinguished from mere assertions, that our domestic architecture has undergone a real process of evolution, and that it has reflected, as indeed one might suppose that it would, the habits and wants of well-to-do English people. The feudal lord, surrounded by his retainers, was satisfied with one great room for his household, a small room for himself when he desired rest and privacy, and a place to cook his food; the more important added to these a chapel. These few rooms were securely placed behind a surrounding wall. The feudal lord's Elizabethan descendant was no longer concerned about the safety of his household. This had increased in number rather than diminished, and while the courtier of the Virgin Queen still kept the old hall of his forefathers, he added a vast array of rooms in one direction for his household, and in another for his great guests and their retinues. His descendant of Queen Anne's time no longer made even the pretence of living in the midst of his household. His servants were banished to a basement or a distant wing, and his chief concern was to have stately halls for the reception of his guests, after whose departure he and his family sought the seclusion of such rooms as were of a reasonable size. But just as these habits were of a slow growth, so the changes which they wrought in the houses were quite gradual. A continuous thread runs through the whole series from the Conqueror to the Georges, and the vast Palace of Blenheim can trace its origin back to the lonely little tower perched on the hill above the Peak Cavern at Castleton.

The Chairman, in inviting discussion, said it was not often that two important architectural works so dovetailed into one another as Mr. Gotch's book on the Renaissance and Mr. Blomfield's. Mr. Gotch developed the history of Renaissance from the Gothic in the most admirable way in his book, and Mr. Blomfield followed that up by his work on the later Renaissance, and the two works came together in a very apt way. He had asked Mr. Gotch how far his book had been read by the public, and he (the speaker) had been rather astonished that the sale, as far as Mr. Gotch knew, was less, in proportion, to architects than to the public, and that the public were really buying the book. Of course, such a book was most useful to architects, but it was very satisfactory to know that the public were buying it and were in that way taking an interest in architecture, and it was a happy presage of what was in store for architects, viz., an increasing interest in English architecture on the part of the public. One point about the lecture had been particularly interesting to him, and that was that wherever *necessity* dictated any particular form or planning it was very tenacious and change was very slow. From such a lecture they could realise how very gradual indeed was the disappearance of any particular feature in a plan. The hall of the house, for instance, persistently retained its form and position, in spite of its being most inconvenient as compared with a central vestibule, when the particular purpose for which the hall was first designed to fulfil no longer existed. A hall was really a most dignified entrance, and they all felt that unless they could provide a large vestibule for their house, dignity was sacrificed. But as regards ornament, that conservative tendency was not observable. Directly there was any knowledge of another style, that style was adopted, and from that time forth fashion seemed to rule in the smaller features and ornament.

Mr. J. Douglass Mathews said the paper had been a most interesting historical one, and Mr. Gotch had succeeded thoroughly in showing in an able manner the natural development from period to period. He desired to propose a hearty vote of thanks to him.

Mr. H. H. Statham, in seconding the vote of thanks, said it was difficult to discuss a paper which was mainly historical. When a lecturer submitted opinions, one could express agreement or disagreement with them, and give one's reasons for doing so, but in a historical survey all one could say was whether the facts were right or wrong, and, in the present instance, he did not question Mr. Gotch's facts at all. It was very interesting to have brought before them the origin of the modern English word the "hall"—"the Hall" of the big house, which was nearly out of use now, and which signified a large and sumptuous dwelling. It originally came, as they had seen, from this utilitarian one-room apartment in which the whole family lived, and it was a very curious thing to find the name surviving when the use of the thing was absolutely and entirely changed. It was one of those points which the study of any particular class of building brought out very often. There was one matter about which he was rather inclined to differ from what seemed to be Mr. Gotch's view as judged from the tone of his lecture. There was rather too much of a snub thrown upon people who built magnificent houses and received their friends in magnificent rooms reserved for the purpose; while they lived in small rooms themselves. That seemed rather a noble and chivalrous thing to do—to keep the fine part of the house for the reception of your friends now and then, sacrificing the pleasure of living in it yourself because it was too costly to keep up all the year round. It rather reminded him of the advice of a wise man, one of the seventeenth-century philosophers, he believed, to a young friend, *i.e.*, "Let your living be below your means, your dress up to your means, and let your residence be beyond your means, for it is your residence that your friends will judge you by." There was a certain amount of worldly wisdom in that.

Mr. Arnold Mitchell said Mr. Gotch had made many interesting allusions to the historical aspect of the question without entering into that too fully, and dwelt particularly upon that period of housework in which, perhaps, the greatest change took place, *i.e.*, in the time of Elizabeth. It seemed an interesting matter to try and arrive at the reason for the radical change which took place about that time. For the reason of that change he thought they should go back a little, and if they did they would find, in his opinion, that the change he referred to was due to the famous law which, though passed some time before, was not put into force until the reign of Henry VII., *i.e.*, the Law of Maintenance, which undoubtedly influenced, if it did not cause, the change. That law proscribed the keeping of more than a certain number of retainers, and as soon as it was enforced there was a change in house-building. The times were more peaceable, and houses which up to that time had been fortified with outside turrets became dwelling-houses in the true sense of the word, rather than semi-fortified places, and it was then that the change occurred in their outside appearance. One expression Mr. Gotch used in describing these Elizabethan houses was most suggestive, and that was "comfort of a kind." The idea of comfort entertained by people in those days was curiously different from the idea of to-day. Recently he had had the experience of staying for a time in an Elizabethan house finished about 1580-85, which practically remained unaltered from the time it was built. The sole means of reaching the bedrooms where guests would sleep was by crossing the great hall, or, on the first floor, by crossing the drawing-room immediately over it. In winter time, hot water needed by any one dressing for dinner had to be taken across the hall or across the drawing-room. A more inconvenient arrangement could not be imagined; the slops, even, had to be carried across the hall or across the drawing-room. This afforded an interesting sidelight upon the idea of comfort existing then; nowadays such arrangements could not possibly be put up with, but in those days they were evidently not considered discomforts. The arrangement for hot water in this particular house was very primitive: the sole means of providing it was by a little copper. Mr. Gotch alluded to the luxurious appearance given to the houses of the time of Elizabeth, and possibly before, in the oak wainscoting of the walls. But it was curious to notice how the builders a short time after counteracted in a measure the luxurious effect of the oak panelling. In the house he had been speaking about the whole of the oak panelling of the twenty bedrooms was painted and grained on the top of the genuine thing. By cleaning off this stuff the cause was found. The panelling which was at first a luxury, became no doub, a grievance, for it made the rooms dark and gloomy, and a coat of white paint was putt over it to add to the brightness of the rooms. The owners then resorted to graining, which had later became the fashion. It was, indeed, a pleasure to have the opportunity of cleaning off the paint, &c., and ot finding, as in this case, that the work was inlaid with bog oak and boxwood.

Mr. Guy M. Nicholson said, in reference to Mr. Statham's remarks as to reserving rooms for the entertainment of friends, it seemed to him that the modern way of doing that on a large scale was very much better, *i.e.*, to hire a town or other hall for the purpose. To live in a house, three-parts of which were not used except on one or two days in the year, seemed to be a most wasteful and unsatisfactory arrangement. He thought the paper was rather comforting in one respect, for it seemed to show that there had becn an improvement by architects in the matter of plan, for one did not find houses built now with the wings difficult to reach one from the other, or the rooms one wanted close to the dining-room, for instance, the farthest from it. In one respect, perhaps, we might return to the old method of doing things. The open-air treatment of consumption might lead to doing without glass in the windows.

Mr. N. F. Barwell said the early history of these old houses and of castles was more a matter of archæological than of architectural interest, for there was not much that could be learnt from the study of them of a practical interest that could be applied to-day. It was impossible, for instance, to put our bedrooms in the thickness of the walls of the house. It was impossible to get modern accommodation and comfort in the old houses which had been referred to, nor did the owners desire it. As to cloisters, Mr. Gotch had said that the loggia never took firm hold in England, but he (the

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speaker) thought that a good many people took pleasure and delight in such a feature. The outside turret staircase was sometimes a useful feature, for it was nice to have a little staircase which would lead up to one's bedroom or study without going through the house.

The vote of thanks was then put to the meeting and heartily agreed to.

Mr. Gotch, in reply, said, as to the desirability of keeping one set of rooms for entertainment, that was a matter of opinion. He was inclined to think that the Elizabethan noble could have entertained his guests with equal grandeur and pleasure in rooms which he occupied himself on other occasions. Still, of course, the fact was that the houses referred to represented the feelings and desires of the people of the time when they were built, and that was of considerable interest, for it showed that at various times various ideas prevailed, and the ideas of to-day were not held by the noble of the Elizabethan or Queen Anne days. As to cloisters and loggie, there again experience had shown that in many of these large houses the cloisters had been enclosed: that was really the point—however much we might think they were pleasant and agreeable, the experience of the owners was to the contrary, and they had been built in and thrown into the house as being more useful. His object had been to show the gradual development of the plan chiefly; the views were shown rather to illustrate how style developed in houses in the same way as in other buildings. The great interest in the subject was to show how the plan grew from very small beginnings in early times and gradually developed, but still maintained the same idea quite up to the time of Inigo Jones, when the great change took place from the mediæval to the classical idea.

The meeting then terminated.

The next meeting will be held on the 17th inst., when Mr. T. C. Cunnington will read a paper on "Architectural and Constructional Engineering."

TRADE CATALOGUES.

MESSRS. W. F. STANLEY & Co., of London, send us their catalogue of surveying and drawing instruments, the first issued since the conversion of the business into a Limited Liability Company. The catalogue includes particulars and illustrations of nearly all the instruments and auxiliaries required by the architect and engineer, and amongst them are several new forms of surveying instruments which have already been noticed in our columns. Messrs. Stanley have recently added a new building to their surveying instrument works, equipped with electrically driven tools adapted to shape much of the work out of the solid, to avoid screwing and soldering as far as possible. This is clearly a move in the right direction, as the number of separate parts can be considerably reduced, rendering instruments more accurate, as well as better able to stand hard wear. Another advantageous feature is that instruments so made will remain in adjustment for a much longer period of time.

Mr. Thos. W. Ward, of Albion Works, Sheffield, sends us a book on "Constructional Steel Work," which is more in the nature of a reference-book than a mere trade catalogue, and is one of several kindred publications that have appeared since we called attention to the highly unsatisfactory nature of most of the handbooks hitherto issued by steel manufacturers and merchants. Some preliminary notes given on the selection of girders ought to be found useful, but the explanatory matter relative to stanchions is rather too brief, and unfortunately includes no reference to non-axial loads. In the numerous tables showing the strength of girders, indication is given of the lengths beyond which excessive deflection will result. This is a convenient hint to users as to the line at which absolute strength ceases to be the governing factor in the selection of a beam. It is a pity that values are not given for the moment of inertia and the moment of resistance; and also that thickness and sectional area should be omitted from most of the tables. With one or two exceptions, none of the tables of columns contain the factors of safety employed, and there is no information as to the formula used for the calculations. Moreover, as a general rule, neither the thickness, sectional area, nor the radius of gyration is stated for the benefit of those desiring to make their own computations of strength. Consequently, this portion of the handbook is of very little practical use. Various simple types of roofs are illustrated in the next section, where there are also particulars of many useful roofing accessories. The remainder of the book is devoted to a very useful and well arranged selection of reference tables. Even in its present form the volume is a distinct advance upon the ordinary section book, and if the essential data now omitted were included it would leave very little to be desired.

Messrs. D. Bruce Peebles & Co. have sent us an illustrated catalogue of their gas burners, governors, and meters. Peebles's needle governor burners are too well known to require description in these columns. House governors of both the diaphragm and the mercurial form are illustrated and described. Small governors for incandescent gas lamps are also manufactured by this firm for use in residences and for street lamps.

Mr. Charles E. Schlimpert, of Colchester, sends us a catalogue of his "Reliance" donkey pumps, which are made on the interchangeable system, and the most ample information is given as to the dimensions and duty of each size. Towards the end of the pamphlet a useful table is found showing the contents of different sizes of pump buckets, and this table is followed by some simple rules by the aid of which any one can determine for himself the most suitable pump to meet any specified requirement.

BOOKS RECEIVED.

FORMAL GARDENS IN ENGLAND AND SCOTLAND. By H. Inigo Triggs. (B. T. Batsford.)

Correspondence.

To the Editor of THE BUILDER.

THE DIRECT EMPLOYMENT OF LABOUR.

SIR,—In my first letter on this subject I gave some views for and against direct employment, founded on personal experience and trustworthy evidence, and, in response to Mr. Chappell's request, I endeavoured to make them more clear to himself. But I have failed, and his letter of last week does not encourage me to persevere. Besides, your correspondent is fully entitled to differ from me, and, although one does not gather that he has had much experience in the direct employment of labour, by private persons or companies, advocates of direct employment will be no worse for his cautions. The "labour" question—*i.e.*, the question of the wages and conditions of labour—is large enough to form a subject by itself, and I am not disposed to go into it.

THOS. BLASHILL.

SIR,—Your readers have heard what the builder and architect have to say on this subject, and I venture to add the testimony of one who is in charge of a staff directly employed in the expenditure of 75,000*l.* per annum in the maintenance, improvement, and repair of 1,043 miles of roads, 300 bridges, and fifty-eight county buildings.

This is the growth of some thirty years, and cannot be compared to a private owner getting together a scratch crew for one building. My advice to such a one would be *Punch's* to those about to marry—"Don't."

There are certain works where the large amount of labour involved and the difficulty of estimating, causes loss either to owner or contractor. These are best done by direct employment of labour. I find there is a loss of ten to twenty per cent. on the labour over contract work and a saving on the materials of about twenty-five per cent., with the satisfaction of knowing you get the quality you intended. I cannot buy cheaper than a responsible builder—if as cheap; he is a constant customer to the merchant, I am intermittent.

Mr. Chappell has hit the mark in pointing out the difficulty of finding a capable manager. You cannot conceive the difficulty of getting such a man that can get together a scratch crew of good workmen. I have a painful remembrance of advising a client to employ workmen to alter and finish a house at Kensington. It nearly ruined me. In another case a client thought the estimate too high, and did it himself at a cost of 600*l.* above the builder's estimate.

Only last year a case was brought to my notice. The builder's estimate was considered too high; the architect was instructed to cut all the expensive work out of it, and do the work direct. A competent clerk of works of the architect's was engaged at 5*l.* 5*s.* weekly and expenses to superintend, purchase material, and pay wages. He had no experience of the purchase or prices of materials, and the cost of an inferior building was some 500*l.* to 600*l.* over the lowest tender.

With good supervision, if a builder's men make mistakes in work, he sets it right at his own cost. With direct employment it is very often allowed to remain, and every opportunity to save is taken advantage of, whereas the contractor is compelled to give the pound of flesh and a little more.

For public bodies and institutions able to keep a continuous staff, and for small, difficult, and intricate works requiring supervision, the direct employment of labour is economical, and I could give hundreds of instances of great savings equal to 50 per cent. in my own practice; but wherever a building can be brought into a bill of quantities, the contract system, with competent supervision, still holds the field.

ROBERT PHILLIPS,
County Surveyor for Gloucestershire.

P.S.—Let me thank you, as a reader of the *Builder* for fifty years, for the splendid No. 3074.

LIVERPOOL CATHEDRAL.

SIR,—Your editorial note on my letter in your last week's issue calls for one remark. What is said about the importance of "axial lines" and "vistas" is all on the principle of putting the whole of one's goods into the shop window. It is a principle which no doubt has its value, and is an especial favourite with French architects. It has never, however, been much adopted in England, and as regards our cathedrals it is conspicuous by its absence. In the great majority of cases—for instance, at York, Canterbury, Salisbury, Norwich, Lincoln, &c.—the cathedral is surrounded by its own "close," retired a little from the main line of traffic, a sort of harbour of refuge from the din and turmoil of the city. Our old cathedrals show themselves grandly from a distance, but within the town they do not assert themselves strongly till one gets into their own neighbourhood.

St. Paul's is, of course, a conspicuous example of the other idea, and one of great weight.

Which of the two is the best for a place like Liverpool I do not presume to determine, but each has clearly its advantages, and neither ought to be condemned simply because it is not the other.

J. OLDRID SCOTT.

SIR,—Mr. J. Oldrid Scott's defence of St. James's Mount site, leads one to surmise that he found it a more difficult task than he had supposed to report in favour of the Cathedral Committee's selection. His letter seems to require some further elucidation, but, even as it stands, it excellently supports the Petition Committee's opposition to the selected site; for it may be summed up as an attempt, not to disprove that Monument-place site is the best available site, but to prove that St. James's Mount site is not worse than that of Monument-place, excepting in regard to what Mr. Scott thinks the "great" and "serious defect" of "want of orientation" and "the narrowness of the site."

For the former, Mr. Scott says that "unhappily, there is no cure;" but the latter, he suggests, "could be remedied easily by encroaching some 40 ft. on the upper terraces of the cemetery." It should be remarked that the cemetery is some 40 ft. to 50 ft. below the intended site, so that the effect of Mr. Scott's suggested remedy may be fully realised; but, in any case, no such remedy seems to be contemplated by the Cathedral Committee, for there is no provision in the Cathedral Committee's Parliamentary Bill and Plan for such addition to the building site.

Mr. Scott's letter, written after he had "lately visited the two sites in question," and after he had been "told" certain things, as he states, makes one regret that he did not further enlarge his acquaintance with the whole subject before he expressed his views; for, had he gathered his information from more than one source, he would not, I feel sure, have questioned "the justice of the very strong objections" which you, Sir, who, I believe, know Liverpool well, see to the St. James's Mount site.

As I think that Mr. Scott may, perhaps, have been unaware of the circumstances of the case when he wrote his letter, I should be glad if you would permit me to ask him, through your columns, the following questions, which seem pertinent to his expression of views, and the replies to which may help to elucidate Mr. Scott's letter.

1. Whether Mr. Scott is aware that Archdeacon Madden, a member of the Cathedral Committee, stated in his speech at the Conference of the Liverpool (South) Rural Deanery upon the 20th ult., that "when the cathedral is built, the whole space round about the Cathedral will be open to the public?" And if, in the case of St. James's Mount site, it is not intended there should be "room on it for buildings other than the Cathedral itself," will Mr. Scott please explain why, in the case of Monument-place site, such provision would be "a point of some importance?" Also, whether it would not be equally possible to acquire additional building sites "other than" for "the Cathedral itself" in the vicinity of Monument-place as of St. James's Mount?

2. Whether Mr. Scott really imagines that "the

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unceasing jangling of the car bells" of trams could be noticed from within a building of the massive construction necessary for a cathedral; and whether, as an experiment, he has ever noticed the "car bells" when he has been within, say, St. George's Hall, Liverpool, close beside which building the trams continually pass in rapid succession?

3. Whether Mr. Scott wishes to imply that "the petitioners seem to look on the jangling of the car bells as an advantage," and, if so, when and where did they do so? If, on the other hand, it is to the fact of Monument-place site being "surrounded by electric tram lines" Mr. Scott refers, will he please explain why an excellent tram service is "hardly an advantage which will be appreciated by those who have to make actual use of the Cathedral"?

4. When Mr. Scott expresses the opinion that "the site in itself is a particularly fine one, and one which any architect would take delight in dealing with," does he intend to speciously refer to "the site itself" only, and to ignore its geographical surroundings, to which reference has been several times made in your columns?

5. Does Mr. Scott seriously contend that to erect a cathedral upon an artificial "plateau some 15 ft. above the flanking road" (which latter would pass along the side of the building) "would give a splendid effect to the principal façade" if it only had an "open space about 500 ft. in depth leading up to it"? Would he also please state what area he would consider "ample room at the further end of the Mount for any further buildings which might be required," and what further buildings he had in mind when he made that statement? Whether, moreover, he, or Archdeacon Madden, correctly indicates the intentions of the Cathedral Committee regarding the purpose to which it is intended to put that portion of the site not required for the erection of "the Cathedral itself," as their respective statements in that regard differ?

6. Whether it is quite fair to, apparently, include the cemetery, which is some 40 ft. to 50 ft. below the site, as part of the latter, especially when it is remembered that by the Parliamentary plan it is so clearly not included?

7. Would Mr. Scott say why, if it "may be quite right in the case of a smaller town that all the great buildings should be grouped together as closely as possible," the same principle should not be applied, where possible, in the case of a large town; whether the object of such grouping is for the sake of "architectural interest" or for public convenience; and whether he does not think that the British Museum, for instance, would be more conveniently situated for the use of the general public were it less isolated from other public buildings in London?

8. If, in the case of St. James's Mount site, "the Cathedral would certainly, by degrees, form its own neighbourhood," is there any logical reason why there should not be the same result were Monument-place site adopted?

9. Would Mr. Scott name the authority who "told" him "that St. James's Mount is very little used"? Would he state the time of year, the day of the week, and the hour of the day when he "saw one young woman, one lad, two boys, and a policeman" using the gardens, and does Mr. Scott consider that a visit during one chance "hour" to the public gardens of a strange city enables him to form a reliable opinion as to the public appreciation thereof as public gardens and recreation grounds? And even were they never used as such, would that fact minimise their health-giving properties as mere open spaces?

Is Mr. Scott aware, moreover, that the St. James's Mount Gardens are the recreation grounds used by the adjacent School for the Blind; that they are largely used by the surrounding householders and by the general public; and that several meetings, attended by hundreds of persons, have been held at the St. James's Mount Gardens from time to time to protest against the proposed acquisition thereof by the Cathedral Committee for building purposes, instead of being continued for the purpose to which they were, some 130 years ago, dedicated for ever to the town?

10. Whether Mr. Scott knew when he formed his opinion upon the suitability, or otherwise, of St. James's Mount site, that test holes have been made, since the Cathedral Committee decided to adopt the site, to ascertain the depth at which a sound foundation could be obtained, and whether it is a fact that

No. 1 test hole is	22 ft. 9 in.	deep below the site.			
" 2 "	"	18 ft. 0 in.	"	"	
" 3 "	"	40 ft. 0 in.	"	"	
" 4 "	"	33 ft. 6 in.	"	"	

and whether he is of opinion that the walls of that side of the Cathedral which would face the cemetery would require to be carried down to about 40 ft. below the level of the site to ensure that they should rest upon a solid foundation?

11. Whether Mr. Scott has formed any estimate of the cost of foundation works, apart from the superstructure, which would be necessary to support a cathedral to be erected upon St. James's Mount site? If he has done so, would he please state his estimate of the amount and the basis of his calculation.

T. MYDDELTON SHALLCROSS,
Hon. Secretary, *pro tem.*, Liverpool Cathedral Petition Committee.

SIR,—Having read Mr. Scott's remarks in last Saturday's *Builder*, I was very much astonished. Is he quite sure that, "after all, people's legs are the same length in Liverpool as they are in London"? The real question is, Why take the Mount away from the people? Mr. Scott says "that to the west, at least, they are of a mean order." He also says that "this site has a great defect in running north and south instead of east and west." If it is a fact that the Mount site is most central, and is very open, then it is precious to the working-men constituency. My contention is that the Cathedral Committee will rob the poor of a much-needed open space. Consequently the objections made by the meetings held on July 1 and 8 last at the foot of the Mount are of a much more serious character than the committee and Mr. Scott think. We addressed 900 on July 1, and more than 1,000 people on July 8 last. Those meetings were representative of the general community. The cloth was not in evidence at those Monday meetings; parsons did not count. It will not be a revelation to say that their Monday meetings can only be described as "packed" ones. Certainly they are not representative of the working men. Of the two sites in question I can see no objection to the Monument; it is not extremely noisy, but is most central. With reference to the site selected, I quite agree with you that "no French architect would pass over want of central vista as being no serious defect." We, the Anti-Mountites, have another plaint against the building on St. James's Mount—that of robbing the children of a playground. The Mount is not a howling and blighted wilderness, it is a pleasure-ground. The Cathedral Committee have not heard the last of the opposition yet. We are going to win. At the battle of the sites in the Liverpool Town Hall on June 17 last, I submitted an amendment in the form of a memorial from ratepayers in St. Domingo, Breckfield, Netherfield, and other wards, protesting against St. James's site.

THOMAS PRITCHARD.
63, Hamilton-road, Liverpool.

THE HAWICK LIBRARY COMPETITION.

SIR,—The generosity of Mr. Carnegie in presenting the Scottish boroughs with libraries is now being realised. Numerous competitions for the new buildings are in anticipation, and several have already been settled. Amongst these, that for Hawick deserves some notice, and I should like to direct your attention to the unfortunate way in which it has been conducted since it left the assessor's hands.

The conditions stated that an assessor was to be appointed, but that the committee did not bind themselves to accept his award. They took full advantage of this clause, but apparently were quite ignorant of their obligations, both to myself, as author of the first premiated design, and also to the rest of the competitors, for without informing them of the public exhibition of the drawings, or offering any explanation for their exceptional proceedings, an architect was chosen by themselves, not the slightest consideration was paid to the assessor's award, and I myself, the winner, was not even afforded an opportunity of meeting them to explain my scheme.

Such proceedings as this will not tend to encourage architects to enter competitions similarly advertised, and it is much to be regretted in view of numerous others of a like nature which are in anticipation.

S. D. ADSHEAD.

BAPTIST CHURCH HOUSE TENDERS.

SIR,—Mr. King is not in possession of all of the facts of this matter, and some explanation is due from me as architect of the building in question.

Tenders were to have been delivered on November 11, but in consequence of the illness of the quantity surveyor, the bills could not be ready in time for that date, and accordingly the opening of tenders was deferred until the 18th; this was the latest possible date for it, as the Committee's report had to be submitted on the 19th to the General Council, the members of which are summoned from all parts of the country, and unfortunately it was found, at the last moment, that the final three bills could not be ready even for that date.

The lowest tender received on the 18th was only 118*l.* below that of Messrs. Higgs & Hill, who were actually at work on the site and who had done about 4,000*l.* worth of work in foundations, &c., and I therefore told the committee that, in my judgment, it was a case in which the rule of accepting the lowest tender might fairly be departed from, and I strongly advised accepting Messrs. Higgs & Hill's tender without reference at all to the remaining estimates. They were very unwilling to go from the usual custom, and, after much discussion, they settled to leave the matter open until the tenders for the remaining trades were received, in the hope that Messrs. Higgs & Hill's final price might alter the position and so save them from doing what might be considered to be unfair. Five builders, all firms of the highest standing, gave tenders on the second lot of bills, and they would hardly have done so if they had felt the proceeding to be unfair to them. The time lost in changing builders would have been a very serious matter, and, as the usual stipulation that the lowest or any tender would not necessarily be accepted had been made, I think we should have been justified, under the circumstances, in giving Messrs. Higgs & Hill the contract in either case.

ARTHUR KEEN.

SIR WILLIAM CHAMBERS.

SIR,—In connexion with your article on the above subject, which appeared in the New Year number, I observe in one of your footnotes that you have been able to refer only to a third edition of the "Treatise," and so I beg to inform you that none of Chambers' references tending to disparage Greek architecture occur in the previous one. In the second edition the chapter in question is named "Of the Origin of Building," and the few sentences devoted to it deal merely, as the title suggests, with legendary matter more or less remotely connected with architecture, including the hazardous speculation of the origin of the Corinthian capital, which Chambers appears to have believed.

Criticism of Greek architecture is totally absent from the second edition, and, indeed, I fancy this is made fairly clear in the third edition itself, for in the closing sentences of the chapter on "The Origin *and Progress* of Building," Chambers says:—

"All that has been said respecting the superiority of Roman architecture was written a considerable time ago, when the Grecian had been extolled into repute: and structures were being erected in different parts of England after Attic designs. Fortunately, the sight of these first specimens excited no desires for more; after a few ineffectual struggles, the Roman manner obtained a complete victory. There seemed at that time no necessity to fight its cause, and these observations intended for the second edition were then suppressed. But latterly the 'Gusto Greco' has again ventured to peep forth and once more threaten an invasion. What, therefore, was omitted in the second edition it has been judged necessary to insert in this as a caution to stragglers."

This contemptuous criticism of the "first specimens" of Greek architecture most probably refers to the early work of James Stuart, who, in 1760, designed the front and some of the interiors of St. James' Place, and as Stuart in his "Critical Observations of the Buildings and Improvements of London" (published in 1771) makes reference to his own design for Lichfield House (No. 15, St. James-square), I think it may also be included among them. The fact that "Grecian had been extolled into repute" is, of course, obvious, since we know that Le Roy's—"Les Plus Beaux Monuments de la Grece" was published in Paris in 1758, and that "Stuart and Revett" first appeared in 1762. These facts prove that Chambers, in addition to having viewed actual modern Greek buildings, had had (prior to 1768) ample opportunity to see "good and reliable drawings" of Greek work, as far as such could be obtained at that period.

Under these circumstances then, and for additional reasons, I venture to take the liberty of questioning the accuracy of your statement that Chambers, while uttering his opinion on the merits of Greek architecture, was "speaking entirely in the dark," though I agree that he had an evident desire to make the least of them. That part of the paragraph which you quote no doubt supports the theory, but if it be continued to the end a very different view presents itself. After discussing the deficiency in constructive skill—"such as their gouty columns, their narrow intercolumniations, their disproportionate architraves, their hypæthral temples which they knew not how to cover," he continues:—

"And their temples with a range of columns running in the centres to support the roof, contrary to every rule of beauty or convenience."

Now I think it would be impossible for any man to invent such an elaborate and particular criticism—more especially as the state of affairs described has an actual existence.

In the temple at Pæstum, which is called the Basilica, there are sixteen columns on each flank and nine on each front. In addition to this peculiarity, the central columns on either front are joined by a colonnade which supported the roof. A plan and perspective of this may be seen in "L'Architecture Grecque," by V. Laloux (page 184 *et seq.*) and in Messrs. Murray & Sons' guide to "Southern Italy and Sicily" (page 178 *et seq.*) there are these dimensions:—

Total height of column 21 ft.
Diameter at base 4 ft. 9 in.,

while a note states that the shaft from top to bottom is in one continuous curve. From the dimensions which are supplied I find the intercolumniation is exactly equal to the lower diameter.

Of course we know that Chambers never visited Greece, but his tour in Italy was for upwards of two years, and so I believe that the evidence proves that he either visited the Greek temples at Pæstum *in situ*, or else had seen an accurate drawing of the Basilica, and had it in mind when he wrote the passage I have quoted.

That his critical judgment may have been unjustly biassed is quite another matter.

MACLAREN ROSS.

*** Mr. Ross's information as to the first edition of the "Treatise" confirms the suggestion we had already made, that some of the remarks in the third

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edition were prompted by the appearance of Stuart's book. What he says as to Pæstum seems probable; but then we should deny that any one who had seen the Pæstum remains *only* had, in the true sense of the words, seen "Greek architecture." It is a long step from Pæstum to the Parthenon.—ED.

MR. BREWER'S DRAWINGS OF OLD LONDON.

SIR,—I should be very much obliged if one of your readers could lend me for a few days the reproductions of Mr. Brewer's drawings of mediæval London which appeared in the *Builder* at various dates between 1884 and 1888. As they are out of print I cannot get them from your office.

I will take great care of them, pay postage both ways, and return them promptly.

The ones I want particularly are those of:—Westminster Hall and its Surroundings, November 15, 1884; Westminster Hall; Old London Bridge, May 10, 1884; Tower Hill, January 7, 1888; Smithfield, Clerkenwell, Southwark, dates unknown to me; but I should be very glad to see the whole set. D. BEDE CAMM, O.S.B.

Erdington Abbey, Birmingham.

The Student's Column.

DRAINAGE AND PRIVATE SEWAGE-DISPOSAL.

CHAPTER 2.—THE LAW IN ENGLAND AND WALES, EXCEPT LONDON *(continued)*.

DRAINAGE RIGHTS (3).—If a sewage conduit is not a drain, it must, according to the definition given in the Public Health Act, 1875, be a sewer, but it is not every sewer into which a building owner has the right of connecting his drain. By Section 13, all existing and future sewers within the district of a local authority shall vest in and be under the control of that authority, except:

"1. Sewers made by any person for his own profit, or by any company for the profit of the shareholders; and

"2. Sewers made and used for the purpose of draining, preserving, or improving land under any local or private Act of Parliament, or for the purpose of irrigating land; and

"3. Sewers under the authority of any commissioners of sewers appointed by the Crown."

Sewers within the district of one local authority may also vest in and be under the control of another local authority. Again, by the definition of the word "sewer" which has already been quoted, the drains of county roads are not sewers.

The sewers to which drains may of right be connected (on conditions to be now stated) are those vested in a local authority, whether this authority be that of the district in which the sewers are laid or of another district.

By Section 21: "The owner or occupier of any premises within the district of a local authority shall be entitled to cause his drains to empty into the sewers of that authority on condition of his giving such notice as may be required by that authority of his intention so to do, and of complying with the regulations of that authority in respect of the mode in which the communications between such drains and sewers are to be made, and subject to the control of any person who may be appointed by that authority to superintend the making of such communications." Failure to comply with these provisions may involve a penalty not exceeding twenty pounds and the closing of the communication.

The owner or occupier of premises within a district has therefore the right of connecting his drains to the sewers vested in the Local Authority of that district, provided that he fulfils certain conditions; but, of course, in order to make such connexion he may not trespass over another person's property or commit a nuisance. Note that, according to the definition in Section 4, the word "premises" includes "messuages, buildings, lands, easements, and hereditaments of any tenure," and that the work must be carried out in accordance with the Authority's "regulations" (not "by-laws"). According to Lumley, the regulations are at the entire discretion of the Local Authority, but the regulations contemplated appear to be general regulations applicable to all cases in the district. In the case of Baxter *v.* Mayor, &c., of Bedford, Mr. Justice Cave decided that the sanitary authority was justified in cutting off the connexion between a house-drain and a sewer, because the owner of the house had not given the two days' notice of his intention to make the drains which the authority's by-laws demanded.

Section 22 gives the owner or occupier of any premises "*without* the district of a Local Authority" the right to "cause any sewer or drain from such premises to communicate with any sewer of the Local Authority on such terms and conditions as may be agreed on between such owner or occupier and such Local Authority, or as, in case of dispute, may be settled, at the option of the owner or occupier, by a Court of Summary Jurisdiction or by arbitration in manner provided by this Act."

The terms and conditions will probably include a monetary payment and compliance with the regulations of what may be termed the foreign Local Authority.

These two Sections (21 and 22) confer important drainage rights on the owners and occupiers of premises. These rights are, however, modified by Sections 16 and 17 of the Public Health Acts Amendment Act, 1890. These sections are among those which may be adopted by both Rural and Urban Local Authorities. Section 16 declares it illegal for any person to suffer to pass into any sewer of a Local Authority, or into any drain communicating therewith, "any matter or substance by which the free flow of the sewage or surface or storm water may be interfered with, or by which any such sewer or drain may be injured." The person committing such offence is liable to a penalty not exceeding ten pounds and a daily penalty not exceeding twenty shillings. Section 17 prohibits the discharge into sewers, or into drains communicating therewith, of

"(*a*) Any chemical refuse, or

"(*b*) Any waste steam, condensing water, heating water, or other liquid (such water or other liquid being of a higher temperature than 110 deg. of Fahrenheit), which, either alone or in combination with the sewage, causes a nuisance or is dangerous or injurious to health."

The maximum penalty for an offence, after seven days' notice has been given by the Local Authority, is 10*l.*, and the maximum continuing penalty 5*l.* per day. By Sub-Section 2 the Local Authority is empowered to enter premises for the purpose of ascertaining whether the provisions of Section 17 are being contravened.

Section 18 of the P. H. A. Amendment Act, 1890, may also be adopted by Rural as well as Urban Authorities, and empowers the owner or occupier of premises to cause the Local Authority to make the communication between "any sewer or drain from those premises" and the Local Authority's sewer. The cost of the work must be estimated by the Surveyor of the Local Authority, or, in case of dispute, by a Court of Summary Jurisdiction (if the estimate is under 50*l.*), and by arbitration (if the estimate is above this amount). The estimated cost must be paid by the owner or occupier before the work is commenced.

4. *Drainage Duties and Responsibilities.*—The most important sections of the Public Health Act (1875) dealing with the duties and responsibilities of building-owners in regard to drainage are Sections 23 to 25:—

"Section 23.—Where any house within the district of a Local Authority is without a drain sufficient for effectual drainage, the Local Authority shall, by written notice, require the owner or occupier of such house, within a reasonable time therein specified, to make a covered drain or drains emptying into any sewer which the Local Authority are entitled to use, and which is not more than 100 ft. from the site of such house; but if no such means of drainage are within that distance, then emptying into such covered cesspool or other place, not being under any house, as the Local Authority direct; and the Local Authority may require any such drain or drains to be of such materials and size, and to be laid at such level and with such fall, as on the Report of their Surveyor may appear to them to be necessary."

A second clause of the section empowers the Local Authority (in case of non-compliance with the notice mentioned above) to do the work, and to recover the expenses in a summary manner from the owner of the house, or to declare them to be private improvement expenses.

A third clause gives the Local Authority the option of constructing a sewer and causing the drains of two or more houses to empty therein, and of recovering the expenses from the owners of such houses, or of declaring them to be private improvement expenses.

The word "house" used in this section "includes schools, also factories and other buildings in which persons are employed." This definition differs from that given in the Public Health Act itself, certain words in this Act having been repealed by the Factory Act, 1878. A Dissenting chapel has been held to be a house within the meaning of the Metropolis Management Acts, as "the chapel had not been consecrated and thus dedicated to permanent and unalterable uses." What is meant by the "site" of a house is not clear; Lumley inclines to the opinion that it means "that piece of land upon which the house itself stands," and not the curtilage. Note that the section gives the Local Authority power to regulate the construction of drains in four respects and in four only—namely, (1) materials, (2) size, (3) depth, and (4) fall. It is, to say the least, doubtful whether a Local Authority can insist on the construction of inspection-chambers, and this view is indirectly supported by a recent decision, which will be noticed under Section 25.

Section 24 empowers a Local Authority to close a drain which, "*though sufficient for the effectual drainage of the house, is not adapted to the general sewerage system of the district, or is, in the opinion of the Local Authority, otherwise objectionable*," and to construct a new drain instead of it, but the work must be done at the Local Authority's expense.

Sections 23 and 24 apply to Local Authorities both urban and rural. Section 25, however, is restricted to Urban Authorities, and to those rural districts or portions thereof to which urban powers may have been granted by the Local Government Board under Section 276.

"Section 25.—It shall not be lawful in any urban district newly to erect any house or to rebuild any house which has been pulled down to or below the ground floor, or to occupy any house so newly erected or rebuilt, unless and until a covered drain or drains be constructed, of such size and materials, and at such level and with such fall, as on the report of the Surveyor may appear to the Urban Authority to be necessary for the effectual drainage of such house; and the drain or drains so to be constructed shall empty into any sewer which the Urban Authority are entitled to use, and which is within 100 ft. of some part of the site of the house to be built or rebuilt; but if no such means of drainage are within that distance, then shall empty into such covered cesspool or other place, not being under any house, as the Urban Authority direct.

Any person who causes any house to be erected or rebuilt, or any drain to be constructed in contravention of this section, shall be liable to a penalty not exceeding fifty pounds."

The meaning of the words "house" and "site" was briefly considered under Section 23. The Local Authority's powers of regulating the construction of drains can best be illustrated by means of a recent decision, which will be quoted in the next chapter.

OBITUARY.

MR. F. W. HORNBLOWER.—We have to record the death, on December 31, of Mr. Frederic W. Hornblower, architect, of Liverpool, eldest son of the late Lewis Hornblower, a prominent Liverpool architect of his day. Mr. F. W. Hornblower was associated with his father in the laying-out of Sefton Park, Liverpool, and their joint plans were awarded the second premium when the designs for similar work at Roundhay Park, Leeds, were under consideration. The deceased was also successful in taking the second place with the plans which he submitted in conjunction with Mr. Francis Holmes for the Government and library buildings at Dublin, the first place being taken by an Irish architect. The late Mr. Hornblower was also entrusted with the execution of a large amount of private work, among others by the members of the Laird family, Lord Brassey, Sir Thomas Brocklebank, Sir F. G. Hesketh, Bart., &c. He also took a prominent part some years ago in the reconstruction of the Liverpool Architectural Society, of which he was for many years hon. Secretary, and subsequently vice-President. He gained, with his father, the first premium for the enlargement of Liverpool Corn Exchange Buildings, and also the second premium for rebuilding the Liverpool Stock Exchange. In 1886 he was awarded the first place in the competition for municipal abattoirs at Birkenhead, and the second premium for laying out Bidston Hill Estate (over 300 acres) for Mr. Vyner. Mr. Hornblower also carried out with his father a very extensive "model" village on fireproof principles at Millom, Cumberland, for the Hodbarrow Mining Co., and laid out with him a building estate near Preston some hundreds of acres in extent.

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GENERAL BUILDING NEWS.

CONGREGATIONAL CHURCH, LONDON.—The London School Board having acquired the site of Trinity Congregational Church, Hanbury-street, Mile End, a new building has been erected at The Broadway, Victoria Park. The church is of red brick, and yellow terra-cotta dressings. It has been planned to permit the old gallery front and other fittings, including pews, from Hanbury-street to be used. The old organ (by Willis), with modern improvements, has been rebuilt, and several of the old stained-glass windows have been replaced. The memorial to Dr. Tyler, who was for long the minister in Hanbury-street, has been re-erected. The seating accommodation is for 800. The school, with entrances in Rutland-road, which runs alongside the church, has accommodation for 300 persons. The buildings are heated with hot water radiators, and ventilated on Honeyman's system, and lighted by electricity. The architect was Mr. P. Morley Horder.

CONGREGATIONAL CHURCH, BRISTOL.—On the 1st inst. Mr. C. E. Hobhouse, M.P., laid the memorial stone of the new Castle Green Congregational Church, which is to be erected at Greenbank, Easton. The main entrance to the chapel is in Kingsley-street. The building will be built of brick, and will accommodate 800 persons. The designs were prepared by Mr. Frank Wills, and to Mr. George Humphreys has been allotted the contract.

ELDER LIBRARY, GOVAN.—Mrs. John Elder, who some years ago gave a park to Govan, has now given to the Burgh a new library. The building occupies a site at the south-east corner of the Elder Park. The style is Classic, and the principal elevation, which is towards the corner where Langlands-road and Thomson-street intersect, contains an entrance colonnade, surmounted by a balustrade, in the centre of which will be carved the Govan coat of arms. The building consists of three floors, basement, ground, and upper. The basement contains a lavatory, furnace-room, packing-room, bookstore, and workshop. On the ground floor there are newsroom, 53 ft. by 23 ft., reference libraries for ladies and gentlemen, committee-room, and librarian's room. The lending library, which is 45 ft. by 22 ft. 3 in., and capable of storing between 20,000 and 30,000 volumes, is also situated on this floor. The feature of the entrance consists of a semi-circular colonnade, from which a vestibule is entered; that in turn leads into a broad corridor, the walls of which are of marble and mosaic. From the corridor a stair leads to the upper flat, which is intended to be used as a museum and juvenile room, separate days being formed in the latter for boys and girls. From the roof, and over the centre of the front entrance, rises a small dome. The architect is Mr. J. J. Burnett, A.R.S.A., Glasgow.

BUILDING IN DUNFERMLINE.—1901 has been a busy one in connexion with the building trade in Dunfermline, and there is every prospect of 1902 being one of the most active experienced in the city. So far as large buildings are concerned, building has been confined to the completion of St. Leonard's School, Pilmuir Works, and the extension of St. Margaret's Roman Catholic School during 1901. This year Pittencrieff School and the new baths and gymnasium are to be erected. In addition to these public buildings, a big increase is to be made in the dwelling-house accommodation of the city. The agitation about the housing problem has brought the necessity for workmen's houses specially before people who like to invest money in building property, and within the past two months such a number of plans for tenements of workmen's houses have passed the Dean of Guild Court as give the impression that the housing problem will soon be solved in Dunfermline.—*Dunfermline Journal.*

CO-OPERATIVE HOUSING SCHEME, PLYMOUTH.—The Plymouth Co-operative Society have inaugurated a scheme for the erection of workmen's cottage dwellings at Laira. The site, acquired three years ago, embraces an area of twenty-three acres, divided into five fields, situated on the southern slope of a rather steep hill overlooking the Laira Old-road. The plans which have been passed by the Corporation provide for the laying out of the estate in streets running along the face of the hill parallel to the Laira-road. It is intended to erect in the first instance 120 four-room cottages. With a frontage of 16 ft. each, the dwellings will be two stories high, and built of brick, with a bay window on each floor. On the ground floor will be a kitchen and parlour, with a scullery in the rear, and on the first floor two bedrooms and a bathroom. In front of each dwelling will be a small garden. Eventually it is intended to build about 500 houses on the estate. Their erection will be carried out by the society itself under the direction of Mr. E. Carwithen, manager of the Works Department.

INFIRMARY, WORKSOP.—On the 1st inst. Mr. Sydney Smith, J.P., Chairman of the Worksop Board of Guardians, laid the foundation-stone of the new Kilton Hill Infirmary, which is being erected for the purposes of the Union by Messrs. J. H. Vickers, Ltd., Nottingham. The building, which will comprise wards for eighty-four male and female patients, administrative and receiving blocks, connected by corridors, porter's lodge, mortuary, stables, &c., is being erected from the designs of Mr. Herbert C. Scaping, of Grimsby. It is to be of brick, with stone dressings, and the contract price is 15,490*l.* The site acquired by the Guardians is eleven acres in extent.

HARROGATE KURSAAL.—The memorial-stone of the Kursaal which is being erected at Harrogate was laid on the 1st inst. by the Mayor, Alderman David Simpson. Mr. R. J. Beale is the architect, and Messrs. Graham & Sons the contractors. The building was illustrated and described in our issue for September 16, 1899.

BUILDING IN BELFAST.—Various causes have combined to keep the building trade in a rather somnolent condition during the past year. The length and duration of the war has no doubt caused some little deflections in the prosperity of the trade as a whole, most people preferring to wait until a time more befitting for the spending of money in any new venture. The building of artisans' dwellings has slackened off much during the last year. The strike in the carpentering branch, which was reported last year, was settled satisfactorily some months ago, both employers and employés conceding several points to arrive at an amicale solution, and many differences which may have been caused by this regretted disturbance of the skilled labour market have now totally disappeared. Prices of steel and iron products used for building purposes have resumed their normal condition. The rear portion of the new City Hall appears now to be almost completed as regards the outside stonework.

PUBLIC OFFICES, YARDLEY, BIRMINGHAM.—Yardley's new public offices adjoin the Sparkhill Police-station. They have been erected and furnished at an approximate cost of 14,000*l.* The building is Renaissance in style, and is of brick with stone dressings and Cotswold stone tiled roof. The design is symmetrical, there being a gable at each end, whilst the central portion is relieved by a circular bay running up to the roof. The arches of the gables are filled in with stone figures carved by Mr. Benjamin Creswick, and the roof surmounted by a small turret. At the north end is a clock tower about 80 ft. high. There are two entrances at the front. One communicates with the main staircase leading to the council chamber, and the other is adapted for visitors to the Surveyor's department. On the ground floor there are eight offices. Two of these, a general and a private office, are reserved for the Clerk to the District Council. The rate collectors will be accommodated in two offices. The department of the District Surveyor (Mr. Arthur W. Smith) will occupy a considerable portion of the ground floor, and will comprise a general office, clerks' office, private office, and plan store, and provision is also made for the sanitary inspectors' department. A stone staircase leads to the first floor, and opens on to a long corridor, broken into bays by piers and panelled ceiling, and running the whole length of the Council Chamber and committee-rooms. The Council Chamber measures 50 ft. by 27 ft. It is entered through double swing-doors at each end. To the height of 4 ft. 6 in. the walls of the chamber are panelled; the roof is open-timbered, supported by five principals springing from carved stone corbels; and the apartment is lighted by stone mullioned windows and leaded lights facing Stratford-road, and a line of clearstory windows, filled with stained glass, on the opposite side. The oak mantels at each end have the monogram of the Yardley District Council in the centre. In addition to a couple of committee-rooms, one on either side of the chamber, the surveyor's drawing-office and a "Mayor's parlour" in miniature, two rooms have been reserved on the first floor as retiring-rooms. There are extensive buildings at the rear of the main block. Entering from Court-road is the depot comprising fire-station, mortuary, stabling, blacksmiths' and wheelwrights' shops, lamp-store, harness-room, fodder and coal stores, mess-room for the firemen, &c. The buildings are heated on the low-pressure system and by radients. Provision has been made for electric lighting, but for the present gas will be used. The buildings have been erected to the designs of Mr. Arthur Harrison, of Birmingham, who also designed the fittings and furniture, supplied by Chamberlain, King, & Jones, Ltd. Mr. William Bishop, of King's Heath, is the builder.—*Birmingham Gazette.*

HOSPITAL BUILDINGS, SEACROFT.—The Sanitary Committee of the Leeds Corporation are about to receive tenders for the erection of twenty-six blocks of buildings for the extension of the City Hospital at Seacroft. The plans have been prepared by Mr. Edwin T. Hall, architect, London.

HOTEL, DONCASTER.—A contract for the erection of a new hotel, to be built at the corner of Bridge-terrace and Hexthorpe-road, Doncaster, for Messrs. Hewitt Bros., Ltd., brewers, Grimsby, and for pulling down the property at present on the site, a portion of which is required for street improvement, has been secured, at about 2,000*l.*, by Messrs. Mullins & Richardson. The new hotel will be built under the superintendence of the architect, Mr. Athron, of Doncaster.

BUILDING IN BRADFORD.—The building trade, which was certainly quiet previous to May 1, was almost stopped at that date by the dispute as to reduction of wages and alteration of rules. For obvious reasons, there have been few contracts let, or even tenders asked for, since the early part of the year. Of the contracts let were a new warehouse in Peckover-street for Messrs. Edelstein, Moser, & Co., the permanent tramshed for the Corporation at Duckworth-lane, the new passenger station at Bowling Junction for the Lancashire and Yorkshire Railway Co., a relief station at Usher-street for the Bradford Board of Guardians, an extension of the Lidget Green Board School, an enlargement of the Corporation Electricity Works at Valley-road, a new warehouse for the Yorkshire Woolcombers' Association at Fairweather Green, and an alteration of Bowling Dyeworks for the Bradford Dyers' Association. Notwithstanding the labour dispute, a number of house-builders have proceeded, with the result that although not so many houses as in former years have been put up, there has been a fair increase in this class of property. The local stone industry has, in conjunction with the building trade, been necessarily quiet, with diminished prices in some classes, but the provincial and London trades have remained fairly good throughout the year, and prices have been well maintained. Locally the timber trade has felt the effect of the curtailment of building operations, but the general and miscellaneous demand has been fairly good.

NEW THEATRE AT MOTHERWELL, EDINBURGH.—The opening ceremony in connexion with the New Century Theatre at Motherwell took place recently. The new theatre, which has been erected at a cost of over 11,000*l.*, is situated in Windmillhill-street. The architect is Mr. Alexander Cullen. The theatre is a two-tier one, and will provide accommodation for about 1,500. The stage is 35 ft. by 50 ft., with proscenium opening of 26 ft.

BUILDING IN DUNDEE.—Mr. Thomson, Assistant Burgh Engineer, reported to a meeting of the Works Committee of Dundee Town Council on the 30th ult., that during the year 1901 the Town Council had approved of 205 new buildings in the city, the total value being 143,000*l.* He stated that thirty-six more plans and sections were approved of during the year than in the past year, but the money value represented a decrease of 15,000*l.*, caused by the buildings erected during the year being of a less important character.

CONGREGATIONAL CHURCH, NORTHAMPTON.—The foundation-stones of the new Congregational Church on Primrose Hill, Kingsthorpe-road, Northampton, were laid recently. The chapel, which is in the Renaissance style, will be of red brick, with white stone dressings. The entrance, which is about 10 yards from the road, will have a bold stone portico, through which entrance to the vestibule will be gained. The auditorium, which will be practically square, will have a domed roof, surmounted by a ventilating turret. The gallery will be at the rear, above the vestibule. The chapel, when opened, will accommodate a congregation of about 500 persons. The cost of the building, excluding the site, will be about 2,800*l.*, and the total cost will be about 3,000*l.* Mr. Alexander Anderson, of Northampton, is the architect; and Mr. G. W. Souster, of Northampton, the builder.

NEW THEATRE FOR NORWICH.—It is proposed to erect a new theatre at Norwich, from plans prepared by Mr. W. G. R. Sprague, of London. The contract for the building has been given to Messrs. Kirk & Randall, of Woolwich. The upholstering will be done by Messrs. Dean & Co., of Manchester, and the decoration by De Jong, of London. The theatre will be built to seat about 2,000 persons. The stage will be 70 ft. broad and 45 ft. deep.

NEW BUILDINGS, NEWCASTLE BREWERIES, LTD.—In connexion with the annual meeting of the Newcastle Breweries, Ltd., held for the first time at the new offices of the Company in the Haymarket, Newcastle, the shareholders were invited to inspect that building, and also the buildings behind, containing the Company's mineral-water factory, wine and spirit stores, and duty-free bond. The main building of the factory, about 120 ft. by 80 ft., by 60 ft. high, contains four floors, the three lower ones being divided into two nearly equal sections. In one section the basement is occupied by beer-bottling stores, and the ground and upper floors by the mineral-water works. In the other section the whole of the floors are occupied as duty-paid wine and spirit stores. In front of this main building there is a large receiving yard, with loading-out quays, approached from the Haymarket by two alternative roadways, and the basement extends under this yard. Large hoists, driven by electricity, connect the loading quays with the various floors above and below. Behind the main building is a large covered yard, among the buildings surrounding which is an electric power station. At the extreme end of the factory building there is stabling for thirty-six horses. On the top floor above the stables there is a granary. Abutting on the stable-yard are coopers' and joiners' shops, harness-room, shoeing-forge, &c. Dining-rooms for the workpeople are also provided. In the basement under the stable-yard there is extensive cellarage connected with and reached through the company's bonded warehouse in St. Thomas's-street. The new office buildings front on the Haymarket. The exterior is of polished granite plinth, and red brick and stone superstructure. In all the rooms the floors are of oak, and the doors

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panelling, chimney-pieces, and other fittings of mahogany. In the basement, besides the strong-rooms, there are wine cellars, lavatory accommodation for the office staff, and the Plenum heating and ventilating apparatus. Mr. Walter Scott was the general contractor for the whole of the buildings, and the architects were Messrs. J. Oswald & Son, of Newcastle.

NEW BUILDINGS FOR GLASGOW PARISH COUNCIL.—New offices for Glasgow Parish Council are being erected from the designs of Messrs. Thomson & Sandilands, architects. The buildings are situated in George-street, immediately opposite the side group of the municipal buildings. The lower part has been kept plain, while above is a series of columns in strong relief, grouped in pairs, supporting a massive cornice and balustrade. The side wings are treated so as to give emphasis to the dome of the central portion. The ground floor is to be occupied by the treasurers and collectors, the first floor by the clerical staff, the second floor by the rooms of the chairman and the principal officials; while the third floor has the board-room, an apartment rising through two stories. When finished the lower part of the walls is to be covered with mahogany panelling, above which rise pilasters surmounted by ornament in bold relief. The rear section of the building is arranged for the purpose of relief of the poor. This section is connected by corridors besides the special entrance by John-street for the relief of applicants. The following are the principal contractors:—Mason and joiner, Messrs. William Shaw & Son; slater, Messrs. Hamilton & Co.; plumber, Mr. Robert S. Renfrew; plasterer, Messrs. Stevenson & Leitch.

ROYAL VICTORIA EYE AND EAR HOSPITAL, DUBLIN.—New buildings are being erected in connexion with this hospital in Adelaide-road. The new building will unite under one roof St. Mark's Ophthalmic Hospital, Lincoln-place, and the National Eye and Ear Infirmary, Molesworth-street. The new buildings will consist of the hospital proper, fronting Adelaide-road—to accommodate 120 indoor patients, with nursing staff—and an out-patients' department. The main frontage of the latter will be in Hatch-lane, by which the out-patients will reach it. The hospital proper will consist of a building of four stories, including the basement. The official and operating block is in the centre, connected by the main corridors with the pavilions, beyond which again are the sanitary annexes. The entire basement will be utilised. The architects are Messrs. Carroll & Batchelor, Dublin; and the general contractors are Messrs. J. & P. Good, Ltd.

MUNICIPAL SCHOOL, GRAVESEND. — Additions have recently been made to this building in Darnley-street. The new assembly hall, 60 ft. by 30 ft., is the central feature. The entrance to the buildings for the girls, with their necessary offices, is at the north-east corner of the hall, whilst those for the boys are at the south-east corner. The hall has on its north side the four old large classrooms, the lighting of which has been improved. It has on its south side a classroom, 30 ft. by 20 ft; a carpenter's shop, averaging 17 ft. by 30 ft.; and a vestibule, which leads to a physical laboratory, 24 ft. by 30 ft., and to a staircase communicating with the first floor, on which are placed a kitchen, averaging 17 ft. by 30 ft.; a classroom for seniors, 25 ft. by 20 ft.; the head-master's room, 13 ft. by 19 ft. (also intended to be used as a committee-room); and the chemical laboratory, 24 ft. by 30 ft. Though the connexion is direct with the classrooms generally, the external entrance to the chemical laboratory is from the open landing, by which means it is hoped to render the school free from unpleasant odours. This landing also forms the connexion with the first floor of the original building. Store and cloak rooms have also been provided. The assembly hall will also be used for calisthenics and gymnastics. The playground for the girls and that for the boys have been cemented, whilst the latter has been considerably enlarged. Mr. E. J. Bennett was the architect, and Messrs. Multon & Wallis the builders.

SANITARY AND ENGINEERING NEWS.

SEWAGE DISPOSAL, STAINLAND, YORKSHIRE.—Mr. W. O. E. Meade-King, C.E., conducted a Local Government Board inquiry in the Stainland Mechanics' Hall on the 31st ult., into an application for sanction to borrow 16,200*l.* for outfall works and sewerage. Mr. Charles Henry Hebblethwaite, the engineer, having explained the scheme, was cross-examined at length.

DOCK IMPROVEMENTS, LONDON.—To meet the demand for more accommodation for large vessels in the Port of London, the directors of the London and India Docks Co. have for the last two years been carrying out alterations and new works at the river entrance to the South-West India Dock. These works have just been completed, and the temporary dams are being removed, so that vessels 450 ft. long and of a carrying capacity of 6,000 tons will be able to enter the dock by the new lock. This dock is, with the exception of Tilbury, the deepest in London, having a depth of 29 ft. With its basin, it has an area of 32 acres, and the quay walls are of sufficient length to accommodate twelve ships 450 ft. long, in addition to a few shorter vessels. But as the old entrance lock was only 300 ft. long, with a depth of 27 ft. on the sill in the centre, reduced to 24 ft. at the sides of the invert, it was decided to increase the length to 480 ft. and lower the sill and invert to 29 ft., and also to construct under the lock a sewer for the London County Council for the drainage of the Isle of Dogs, to replace an old sewer in the bed of the river in a somewhat dangerous position across the entrances to several docks. To exclude the water from the site of the works the contractors placed a timber caisson across the lock at the river end and drove a semi-circular dam in the basin. This dam had a length of 360 ft., and was formed of a single row of double timber piles 45 ft. to 50 ft. long by 26 in. thick, driven 15 ft. into the bottom of the basin, and supported at the top by a timber rib 16 ft. wide to preserve a true circular curve to the dam. The bottom of the basin, being composed of very fine silt and running sand, gave a great deal of trouble, and serious delay occurred in consequence of the water blowing up under the piles until the contractors weighted the bottom with a bank of sand in bags 15 ft. high, and tipped a bank of clay on the water side, after which the dam was perfectly watertight and stood very well. The extra pair of gates required for the extension were obtained from another part of the dock where they were no longer required. As the mud in these docks causes great inconvenience in working the gates, iron pipes connected with the sluice culverts have been embedded in the concrete of the new gate platform, so that the act of lowering the water in the lock draws away the mud from the roller paths. The sluices are in duplicate, one set worked by hydraulic power, the other by hand in case of a breakdown. The sewer, which is 500 ft. long, is carried under the lock by two cast-iron culverts, each 4 ft. 6 in. in diameter, bedded in concrete. These culverts enter penstock chambers 50 ft. deep, built in brickwork through the centre of each quay wall, and can be closed by hydraulic sluices. The approach sewers on either side from the public road are 4 ft. 9 in. in diameter, and built of brickwork in tunnels which were driven through the sand. The cost of the works, including the sewer, has been about 52,000*l.*—*Times.*

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The partnership of Messrs. Dalgleish & Dickens-Lewis, architects, of Shrewsbury, has been dissolved, and they will practise separately at the undermentioned addresses, viz., Mr. C. R. Dalgleish at Central Chambers, Wellington, and 18, Talbot Chambers, Shrewsbury; and Mr. G. Dickens-Lewis at 12A, Talbot Chambers, Shrewsbury.

CHURCH OF ST. STEPHEN, POPLAR.—A faculty has been granted by Dr. Tristram, K.C., Chancellor of the Diocese of London, for the erection of a side chapel, and the placing therein of a second Holy Table, in the parish Church of St. Stephen, Poplar, which was built in East India-road in 1866, after Francis's plans and designs.

ELECTRIC LIGHT, LONG EATON.—On the 1st inst. Colonel W. Langton Coke, C.E., held an inquiry in the High-street Board School, Long Eaton, touching the application to borrow 15,000*l.* for the installation of the electric light at Long Eaton. Mr. Williams, Clerk to the Council, explained that the Report of Mr. Crowther, electric engineer, Wallasley, was practically endorsed by Messrs. Hopkinson & Talbot. Time had been lost, and the Council had lost customers, and unless the matter was proceeded with expeditiously more customers would be lost. Provisional contracts had been entered into for the work. Mr. J. H. Crowther and Mr. Worrall, C.E. (Surveyor) gave evidence as to the details of the scheme.

HOUSING, BLACKLEY ESTATE, MANCHESTER.—The Sanitary Committee of the Manchester City Council instituted recently a series of inquiries into certain objections raised by the Citizens' Committee as to proposals of the Council for the execution of the first set of houses on the Higher Blackley Estate, which was purchased some time ago under the Allotments Act. As a result of investigations by the Housing Sub-Committee and the City Surveyor, new plans were prepared for adoption by the Sanitary Committee, and the Local Government Board will be asked to give their approval to these. In the main the new plans are drawn upon the lines adopted in some model cottages recently erected at Leek, Staffordshire. They provide for several improvements on the original proposals. The chief additions are a bathroom and a bedroom, the bathroom being placed on the ground floor immediately behind the kitchen fireplace. Folding doors are placed between the bathroom and the scullery to give access and to separate the two apartments when the bath is in use. The bath is available for washing purposes generally, and will be fitted with a shower appliance. The bath will be supplied with water automatically, and will have an independent small fireplace underneath it for use during hot weather, when the kitchen range is not required. The third bedroom is in the centre of the building, the floor being 3 ft. 6 in. higher than that of the bedrooms. The light is derived from a dormer window set back in the roof and overlooking the main street at the front. The alterations in the scheme will involve an additional expenditure of about 7,000*l.*—*Manchester Courier.*

LONDON TOPOGRAPHICAL SOCIETY.—In regard to the remarkable survey drawings of the roads of Knightsbridge, made by Salway in 1811, and referred to in the article on old Knightsbridge in our last, we are glad to hear that the London Topographical Society are issuing a reproduction of this remarkable work. There are thirty sections of the plan, extending from Hyde Park Corner to Counter's Bridge, some of which have been issued to members of the Society, and the remainder will be in their hands during the year.

ASPLEN'S TRENCH CUTTER AND ROAD SCARIFIER.—This newly-patented machine is mounted on a trolly provided with draw-bar so that it may readily be transported from place to place. When required for use, the apparatus can be attached to any road-roller or traction-engine, and the larger size has a side attachment for this purpose. The portion carrying the teeth is adjustable by means of a central handwheel and screw, at each side of which are smaller screws for regulating the teeth themselves.

CAPITAL AND LABOUR.

THE BRADFORD BUILDING TRADE DISPUTE.—Negotiations between the representatives of the labourers employed in the Bradford building trade and the Bradford and District Master Builders' Association have resulted in the settlement, so far as the labourers are concerned, of the dispute which has been in progress since May 1. The cause of the dispute was the refusal of the masters to grant an advance of 1d. per hour in the wages paid, and the men left work at the same time as the masons and joiners, who were, and are still, resisting a reduction of ½d. per hour and certain alterations in the rules regulating employment. Recently the secretary of the Labourers' Union wrote to the Master Builders' Association stating that the men desired to withdraw their demand for an increase of wages, and asking that they might be reinstated as early as possible, without prejudice or malice. A conference followed, at which the men expressed their willingness to come to terms on the basis of the arrangement which prevailed in 1894. This offer was accepted, and the masters decided to circularise the federated employers, stating that "Although they feel that it will be difficult to find employment for all the men at once, it is hoped they will replace the men as early as ever possible without prejudice." The terms of settlement provide that the wages shall be 6d. per hour. During the course of the dispute the men have been in receipt of 10s. a week as strike pay, but the funds are now nearly exhausted. The number of men ready to start work again is about 120. As regards the masons and joiners, the settlement of the dispute seems as far off as ever. In both cases the men are receiving an out-of-work allowance of 1*l.* per week, and as they have wealthy unions behind them, it would seem that they will be able, unless the improbable contingency of a general strike should arise, to continue the struggle indefinitely.—*Yorkshire Observer.*

BUILDING DISPUTE AT MAIDSTONE.—A dispute has arisen between masters and men in the building trade in Maidstone, as to the hour at which the latter should start work during the winter months. One of the largest firms in the town has locked out its men because they arrived at 8.30 instead of 8 p.m., the time fixed by the Master Builders' Society.

PERTH PLASTERERS' STRIKE. — Some time ago the master plasterers of Perth sent a circular to the men intimating a reduction of wages from 8½d. to 8d. per hour. The men thereupon came out on strike. A meeting of the masters and men was held a few days ago, when the masters agreed to a compromise—that the wages would be reduced on and after March 10. A letter has since been received by the secretary of the Masters' Association from the men's secretary intimating that the men were quite prepared to accept the terms offered.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

15,954. — A MOTOR FOR GENERATING ELECTRICITY: *D. McGregor.*—A vertical spindle carries a drum upon which blades are mounted, the opposite pairs of blades being linked together and so arranged that as the water current extends one blade the other blade becomes closed against the drum. For a tidal current the water is directed with hinged flaps which will be reversed as the tide turns. The top of the drum is fairly level with the stream, and the drum may be caused to slide upon the shaft, and, through its own buoyancy, to adjust itself to variations in the level, or it may be carried upon floats in wells of which the buoyancy can be adjusted at will by changing the amount of air that they contain.

16,122.—SAFETY MECHANISM FOR LIFTS AND ELEVATORS: *C. L. Buddenbohn & W. Speer.*—A

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governing mechanism automatically causes cams upon a flexible rock-shaft carried by the car to engage with their guide-rails when an excessive rate of speed is attained. It has a rotary shaft, from which extend arms, of which the spring-pressed side-blocks can be thrown outwards by the rotation of a pulley, and is driven with a shaft-cord passed around pulleys and weighted at its lower end. The flexible shaft is worked, in opposition to a dead weight, with a vertical slide joined with a chain to a bell-crank lever pivoted on to the car, in which is a hand-lever joined to a bent link that will serve by means of its vibration as an indicator, and can be used for arresting the car.

16,123.—A BRAKE FOR USE WITH FIRE-ESCAPES: *C. L. Buddenbohn and W. Speer.*—For an automatical brake the inventors pass the lowering rope from an idle reel many times around the drum and thence to the escape-ling. A sleeve upon the main axis is rotated at a high speed by gearing from the drum, and its radial arms carry sliding weights, which centrifugal force acting in opposition to springs will impel outwards; the rate of descent can be regulated by means of the action of the weights on inclined planes, so as to press braking-shoes against the sides of the drum; for a more rapid descent one can control the movement lengthwise of the sleeve with a face-cam and lever, and for arresting it another lever is fitted; a fixed ring, having a spiral groove, guides the turns of the rope sideways; spring-pegs force the rope against the drum, which should have a polygonal periphery.

16,132.—A TRAP FOR DRAINS: *F. Edrick.*—In order to prevent back-flow a flap-valve is adjusted at one end of a cone-shaped length of pipe; a disc faced with indiarubber, and having an eccentrical orifice, constitutes the seating of the valve, which is made of a rubber disc encased within two smaller metallic discs.

16,164.—AN ELECTRICAL CURRENT METER: *A. C. Heap.*—The novelty consists of an improved mounting of the coil, a divided magnetical circuit, and insulated magnets (in order to obviate electrostatical effects) for a moving-coil ampère or volt meter for continuous current. An open, rectangular, metallic frame upon which the coil is wound has end-holes that fit upon an undivided axle which extends through the coil and to which the coil is clamped with nuts, one end remaining free enough for expansion by variations of temperature. There are two spiral controlling and connecting springs and a balanced pointer. Two angle-pieces upon a base-plate carry two permanent magnets which have four pole-pieces. On each angle-piece is a semi-cylindrical core that will pass between the axle and the coil. The insulated base-plate carries the scale of the meter, being joined with the circuit for prevention of electrostatical effects or discharge between the magnets and the coil when the flow of a high-pressure circuit is being measured. In another shape one magnet only is used; it is mounted upon a fixed bracket which carries one half-core and two pole-pieces that fit within the magnet, which carries the other half-core and two pole-pieces, together with the scale.

16,166.—AN ADJUSTMENT FOR WINDOWS: *E. Reiss.*—A lazy tongs frame-work joins the window or skylight to the frame, as well as to a set of louvre frames. For purposes of lifting, a rod with levers or other gear is provided. One line of pins are guided in slots of the frames, the other line of pins are pivoted on to the frames.

16,167.—CONSTRUCTION OF PAVEMENTS: *A. Metz.*—A thin stratum of melted bitumen or asphalt is laid over a cement foundation of lime or common cement; in or upon that is laid a strengthening frame, made of either cement roughened blocks or a trellis-work of sheet metal. Above is laid an admixture of bitumen, asphalt, gravel and ground stone. Before the topmost layer has become set, a non-slipping surface is spread over it, consisting of ground stone, rammed and rolled.

16,193.—FASTENERS FOR WINDOWS: *G. C. Brown.*—For sashes that can be turned inwards (*see* No. 23,489 of 1898) is devised a flanged and slotted locking-plate to which the cord is secured, and which will engage with a sash-plate, being held with a spring catch which passes into the slot as one turns the sash inwards; with the turning of the sash into the frame again the catch is forced back out of action by means of a bevelled projection upon the sash-plate. In the pulley-stile is a recess within which a portion of the parting-bead will slide backwards against the pressure of springs, and wherein it will be held by an inclined and flanged bolt that slides down through its own weight; the bolt is forced backwards as one lifts the sash in its frame so that the freed parting-bead will thereupon spring out.

16,220.—TREATMENT OF SMOKE: *W. Wild and D. Rigby.*—The smoke from kilns, furnaces, &c., is washed with water or milk of lime as it passes through a receiver fitted with balls or pierced plates of earthenware, wood, metal, &c., and dipped into a trough of water. The smoke is conveyed thence into a set of inverted troughs, which are dipped into water or milk of lime in a second chamber, narrow slots are made in the bottom edges of the troughs for the passage of the smoke, and a fan, or steam jet, draws the washed smoke into the chimney.

16,233.—PAVING-BLOCKS, PAVEMENTS, &C.: *A. Metz.*—Slabs, tiles, panels, &c., of granite, and so on are embedded in a layer of cement or asphalt for a non-slipping surface. They are laid upon a cement or concrete bed, over a shallow layer of asphalt or cement (as above). *See also* No. 10,841 of 1896.

16,241.—A CHECK FOR DOORS AND GATES: *T. Clements.*—A spiral spring forces a roller having a rubber tyre on to the floor, its casing being secured to the door, and its tension controlled with a screwed cap; a crank or an eccentric upon the door handle enables one to raise the spring as one opens the door; a connecting rod from the crank has a pin that works within a vertical slot having an L-head, whereby the roller is sustained by the lifting and turning of the rod; it is stated that the door will be held in any position by the friction of the roller against the floor.

16,248.—A SOCKET FOR ELECTRICAL COUPLINGS: *G. A. G. Davies, H. W. Kent, and B. G. Stewart.*—The insulating body of a floor or wall socket is fashioned with an extended part that fits into a recess formed in an insulating-disc of porcelain, &c., affixed with screws so that the metallic portions shall not be liable to accidental short-circuiting; dirt can escape from the metallic tubes through apertures in the insulating-disc.

16,301.—A VENTILATING SHAFT-TOP: *F. Orr and T. McCulloch.*—Two compound hollow cones, whereof one is encompassed by the other and which are held asunder with fins, divide the top portion of a flared shaft into inner and outer passages having a common axis. At the top of the inner cone is a covering cap, and at its base is a small inverted cone secured within the outer cone; a change of position for the ducts is provided by means of slotted tongues upon the fins that engage with rivets on the flange of the head-piece, or the parts can be kept down in position with a bolt from the cap to a saucer which collects the rain.

16,311.—SLEEVE AND SPIGOT-AND-SOCKET JOINTS: *F. Wigham and G. A. Wigham.*—The inclined faces of the half-socket of the one pipe will engage with the similar faces upon a loosely sliding sleeve, a recess being provided for the packing material.

16,380.—MECHANISM FOR WEIRS: *Vereinigte Maschinenfabrik Augsburg und Maschinenenbau-A. G. Nürnberg A. G.*—To provide means of opening a weir against the action of ice, alluvium, and so on, a beam which is laid across the top of the weir wall carries a roller, made up of strong iron plates arranged at a radius about equal to the height of the normal water-level above the beam. Water can pass into or out of the roller through holes in its ends, which repose in quadrants. A motor serves to turn chain-wheels at the ends of the roller, whereby a toothed ring upon the roller engages with an inclined, or otherwise a horizontal, rack so as to lift the roller.

16,381.—A WATER-BOILER FOR DOMESTIC AND OTHER USES: *O. Whitaker and G. Whitaker.*—A dish-shaped earthenware cover having a rib upon its under surface and being salt-glazed or enamelled upon its top surface and fitted with a hinged lid that affords access to the boiler, is made for the casing. A damper regulates an opening which is formed between the hood, which conveys steam from the pan to the uptake, and the uptake itself. The hood can be bolted to the cover by means of a groove having dove-tailed edges. For the boilers confer No. 19,368 of 1898.

16,393.—A VENTILATION-TOP FOR SHAFTS AND CHIMNEYS: *W. H. Dingle and J. M. Urquhart.*—An under-hood fashioned with a convexed side and a re-entering side, that contract the passage between its two flat sides, is mounted upon the conical outlet of the chimney-top. At the mouth of the cone, and above the air-inlets made with the space between the hood and the cone, are set two deflectors, and there is another deflector underneath an outlet in the side of the bend. In another shape, the hood takes the form of a wide bottle, and within it are disposed two deflectors which provide a bent or zig-zag passage, which in that case has no outlet in its side.

16,430.—HOISTING APPARATUS FOR BUILDERS' USE: *L. Müller.*—The apparatus is intended for use in the building or repair of chimneys. A framing, through which a pair of pins is inserted, is laid upon a socket or pillar, which is carried by cross-bars built into the chimney. Two pulleys with ball bearings are mounted on the two pins, and another pulley is carried by the forked end of the stem of the pillar. The distance between the two end pulleys on the pins may be altered by means of holes made at intervals in a pair of parallel bars that constitute the framing, the holes being formed for engagement with the pins.

MEETINGS.

FRIDAY, JANUARY 10.

Architectural Association Discussion Section.—Mr. P. W. Mulready on "The Work and Influence of Augustus Welby Pugin." 7.30 p.m.

Birmingham Architectural Association.—Mr. John Ward on "Pictures from Penzance and the Land's End."

Glasgow Architectural Craftsmen's Society.—Mr. A. B. M'Donald, M.Inst.C.E., on "The Highlands of Central Europe." 8 p.m.

SATURDAY, JANUARY 11.

Dundee Institute of Architecture.—7 p.m.

MONDAY, JANUARY 13.

Surveyors' Institution.—Mr. John H. Hanson on "Rivers' Pollution: Purification of Trade Waters from a Mill Occupier's Point of View." 8 p.m.

Society of Arts (Cantor Lectures).—Dr. Samuel Rideal, D.Sc., F.I.C., on "The Purification and Sterilisation of Water." I. 8 p.m.

Clerks of Works' Association (Carpenters' Hall, London-wall, E.C.)—Mr. Herbert M. Ellis on "William Morris, Poet, Artist, and Craftsman." 7.30 p.m.

Bristol Society of Architects.—Mr. F. Bligh Bond on "Rood Screens, English and Continental," with lime-light illustrations." 8 p.m.

Clerks of Works Association (Carpenters' Hall).—Paper by Mr. Herbert M. Ellis. 8 p.m.

TUESDAY, JANUARY 14.

Institution of Civil Engineers.—Mr. H. B. Molesworth on "American Workshop Methods in Steel Construction." 8 p.m.

Institution of Electrical Engineers (Glasgow Section).—"Practical Notes on Continuous Current Distributing Mains," by Mr. John C. A. Ward. 8 p.m.

WEDNESDAY, JANUARY 15.

Society of Arts.—Mr. Frank J. Gray on "Elliptographs." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Annual meeting of the members. 8 p.m.

Northern Architectural Association.—Mr. J. Bruce on "Recent Data Concerning Concrete Beams and Concrete Floors." 7.30 p.m.

British Archæological Association.—8 p.m.

THURSDAY, JANUARY 16.

Royal Institution.—Dr. A. S. Murray, F.S.A., on "Recent Excavations at Delphi and in the Greek Islands." I. 3 p.m.

Leeds and Yorkshire Architectural Society.—Dr. N Bodington, Principal of the Yorkshire College, on "Schliemann's 'Troy.'" 6.30 p.m.

FRIDAY, JANUARY 17.

Architectural Association.—Mr. T. C. Cunnington on "Architectural and Constructional Engineering." 7.30 p.m.

Royal Institution.—Rt. Hon. Lord Rayleigh on "Interference of Sound." His Grace the President will, after the discourse, unveil and present to the Institution a bust by Mr. Onslow Ford, R.A., of Sir Frederick Bramwell, Bart., D.C.L., LL.D., F.R.S., Hon. Secretary of the Royal Institution from 1885 to 1900. 9 p.m.

Institution of Civil Engineers (Students' Meeting).—Captain H. Riall Sankey on "The Theory of Heat-Engines." 8 p.m.

Institution of Mechanical Engineers.—(1) Nomination of officers for election at the annual general meeting on February 21; (2) Mr. H. F. L. Orcutt on "Modern Machine Methods." 8 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

December 17.—By W. & T. T. Iveson (at Newcastle).

Thorneyburn, Northumberland.—Low Eals Farm, 195½ a. f.	£5,130
Thropton, Northumberland.—A freehold farm, 41¾ a.	2,150

December 19.—By ROGERS BROS.

Dulwich.—25, Lordship-lane, u.t. 78 yrs., g.r. 5*l.* 5*s.*, r. 30*l.*	300
2 and 4, Hansler-rd., u t. 79 yrs., gr. 10*l.*	525
128 and 130, Melbourne-grove, u.t. 74 yrs., g.r. 13*l.*, r. 60*l.*	555

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS &c.

	£	s.	d.			
Hard Stocks	1	12	0	per 1,000	alongside,	in river.
Rough Stocks and Grizzles.....	1	10	0	,,	,,	,,
Facing Stocks	2	12	0	,,	,,	,,
Shippers	2	8	0	,,	,,	,,
Flettons	1	8	0	,,	at railway depôt.	
Red Wire Cuts ..	1	12	0	,,	,,	,,
Best Fareham Red	3	11	0	,,	,,	,,
Best Red Pressed Ruabon Facing.	5	5	0	,,	,,	,,

[*See also page 51.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*Plans for Rebuilding Institution	Liverpool Infirmary Committee	Four Premiums of 50*l.*	Jan. 31
*Laying-out Pleasure Ground	Aldershot U.D.C.	20*l.*, 10*l.* and 5*l.*	Mar. 1
*Proposed Public Offices	do.	100*l.*, 75*l.* and 50*l.*	Mar. 29
*New Buildings at Langho, near Blackburn	Chorlton, &c., Jt. Asylums Com	200*l.*, 150*l.* and 100*l.*	April 4

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Making-up Russell-rd. Herbert-rd. &c., West Hendon	Hendon U.D.C.	S. Slater, Grimley Public Offices, Hendon, N.W.	Jan. 13
*Paving Materials	Metropolitan Borough of Stepney	M. W. Jameson, 15, Great Alie-street, Whitechapel, E.	do
Repairs to Salvation Barracks, Neyland		S. W. Evans, Architect, Front-street, Neyland	Jan. 14
School, Oak-street	Bath School Board	W. J. Willcox, Architect, 1, Belmont, Bath	do.
Inn, Westgate, Rotherham	R. J. Bentley's Trustees	G. A. Wilson, Architect, Hartshead Chambers, Sheffield	do.
Police Station, Woodhouse, near Sheffield	Standing Jt. Com. West Riding C.C.	J. V. Edwards, County Surveyor, Wakefield	do.
Cottage, Clontail	Ardee (Ireland) R.D.C.	L. Turley, Civil Engineer, 17, Laurence-street, Drogheda	do.
Road Works, Walton-street, &c.	Enfield U.D.C.	R. Collins, Council's Surveyor, Court House, Enfield	Jan. 15
*Making-up Streets	do.	do.	do
Building Work at Workhouse	Farnham Guardians	Friend & Lloyd, Architects, Aldershot	do.
Sewers, Northfield-lane, &c.	Ealing Borough Council	C. Jones, Civil Engineer, Town Hall, Ealing	do
Sewerage Works, Bargoed and Gilfach	Gelligaer R.D.C.	J. P. Jones, Surveyor, Council Offices, Hengoed	do
Houses, Birdwell, Yorks	Messrs. Thorpe & Robinson	A. Whitaker, Architect, Worsborough, Barnsley	do.
Three Houses, Birdwell	Mr. T. Greenwood	do.	do.
House, Double Mills	Cockermouth U.D.C.	J. Fearon, Council Offices, Cockermouth	do.
Baths and Gymnasium, Dunfermline		H. J. Blane, Architect, 25, Rutland-square, Edinburgh	do.
Stone, &c.	Banbury Town Council	N. H. Dawson, Civil Engineer, Town Hall, Banbury	do.
Road Works, Broomhall & Glossop-rds., Sanderstead	Croydon R.D.C.	R. M. Chart, Surveyor, Town Hall, Croydon	do.
Road Works, Greyhound-lane, Mitcham	do.	do	do.
Additions to The Hollies, Halfway-street, Sidcup	Greenwich Guardians	T. Dinwiddy, Architect, 12, Croom's-hill, Greenwich, S.E.	Jan. 16
Stone, &c.	Rugby U.D.C.	D. G. Macdonald, Civil Engineer, Rugby	do
Waterworks	Lochgelly Town Council	Buchanan & Bennett, Civil Engineer, 12, Hill-street, Edinburgh	do.
Filter Bed, &c., Arelid	Congleton Guardians	C. R. Hall, Engineer, Congleton	do.
Dep t, Queen's-road	Hastings Corporation	P. H. Palmer, Civil Engineer, Town Hall, Hastings	do.
Business Premises, Letterkenny, Ireland	Miss Rooney	M. O'Callaghan, Architect, Letterkenny	do.
Road Works, Carlton-road	Friern Barnet U.D.C.	E. J. Reynolds, Civil Engineer, Barnet	do
Stonework, &c., Otterbourne Waterworks	Southampton Corporation	W. Matthews, Engineer, 18, French-street, Southampton	Jan. 17
Paving Works, &c., Market Hill	Alnwick U.D.C.	G. Wilson, Surveyor, Green Bat, Alnwick	do.
Sewerage Works	Kilmalcolm (N.B.) District Com.	J. Murray, Civil Engineer, County Buildings, Paisley	do
Culverts and Road Diversion, Turweston	Buckingham R.D.C.	T. R. Hearne, 23, West-street, Buckingham	do.
Broken Granite (6,700 tons)	Spilsby R.D.C.	T. A. Busbridge, Civil Engineer, Spilsby	do.
Slag and Gravel (7,000 tons)	do.	do.	do.
Additions to Asylum, Parkside, Macclesfield	Committee	H. Bestwick, County Architect, Chester	Jan. 18
Sewerage Works, Bloxwich	Walsall Corporation	Borough Surveyor, Bridge-street, Walsall	do.
Warehouse, Clarence Mills, Cleckheaton		T. Barker & Son, Civil Engineers, 5, Bank-street, Bradford	do.
Organ Chamber, &c., Ton Pentre		J. Rees, Architect, Pentre, Glam	do
Tramway Depot, Rochdale-road	Bury (Lancs) Corporation	A. W. Bradley, Civil Engineer, Bank-street, Bury	Jan. 20
Church Tower, Bettws-y-Coed		Wright & Sons, Surveyors, Lancaster	do.
House, Brownlow-street, Liverpool	Lancs County Council	H. Littler, Architect, County Offices, Preston	do.
School, Aberfan	Merthyr Tydfil School Board	J. L. Smith, Architect, 50, High-street, Merthyr	do.
Hospital, Llandough	Penarth U.D.C.	E. J. Evans, Civil Engineer, Penarth	do.
Additions to Munster Institute		H. Williams, Office of Public Works, Dublin	do.
Hospital, Eskdale		R. M'George, Langholm	do.
Buildings, Change-alley, &c.	Messrs. T. A. Ashton, Limited	Gibbs & Flockton, Architects, 15, St. James'-row, Sheffield	do.
Footbridges, Colwall, Twerton and Hirwain	Great Western Railway Company	G. K. Mills, Paddington Station	Jan. 21
*Making-up Junction-road	Brentford U.D.C.	W. Nowell Parr, Clifden House, Boston-road, Brentford	do.
*Supply of Guernsey Granite and Flints	Acton District Council	Council's Surveyor, 242, High-street, Acton	do.
*Pulling down Buildings, Brook-street, S.E.	Lambeth Guardians	W. Thurnall, Brook-street, Kennington-road, S.E.	Jan. 22
Sewerage Works	Marlborough Town Council	Fairbank & Sons, Civil Engineers, Leudal, York	do.
Restoration, Church, Lockingate, Luxulyan, Cornwall	Vicar and Churchwardens	Vicar, The Rectory, Luxulyan	do.
Sewers, &c., Warth Fold to Starkies	Bury (Lancs) Corporation	A. W. Bradley, Borough Engineer, Town Hall, Bury	do
Firebricks, &c.	Salford Corporation	W. W. Woodward, Engineer, Broom-street, Salford	Jan. 23
*Road Making, Kerbing, Paving, &c.	Hackney Borough Council	Borough Engineer, Town Hall, Hackney	do
*Extension of Electric Light Works	Hull Corporation	City Engineer, Town Hall, Hull	do
Drainage Works at Workhouse	Clonmel (Ireland) Guardians	E. A. Hackett, Civil Engineer, Workhouse, Clonmel	Jan. 24
*Enlargement of Head Post Office, Norwich	Commissioners of H.M. Works, &c.	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	do
Road Materials, &c.	Hailsham (Sussex) R.D.C.	J. Huxley, Civil Engineer, 17, London-road, Hailsham	Jan. 25
*Petty Sessional Courts and Offices	City and County of Bristol	H. Williams, Imperial Chambers, Corn-street, Bristol	Jan. 30
Schools, Penygraig, Wales	Ystradfellte School Board	T. Roderick, Architect, Clifton-street, Aberdeen	Jan. 31
New Infirmary at Hatfield	Hatfield Union	C. Smith & Son, 164, Friar-street, Reading	No date
Four Houses, Littleborough, Lancs		T. Wild, Hollingworth-road, Littleborough	do.
Stabling at Workhouse, Longtown		J. Murray, Surveyor, Kirklinton, near Carlisle	do.
Rebuilding Beach Hotel, Hollingworth Lake, Lancs.		Openshaw & Gill, Architects, 6, Fleet-street, Bury	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Draughtsman	Met. Borough Bethnal Green	110*l.*	Jan. 17
*Architectural Assistant	Southwark Council	3*l.* per week	Jan. 20

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x & xxii. Public Appointments, pp. xviii & xxii.

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PRICES CURRENT (*Continued*).

BRICKS, &c.

	£	s.	d.	
Best Blue Pressed Staffordshire ..	4	6	6	per 1,000 at railway depot.
Do., Bullnose	4	10	0	,, ,, ,,
Best Stourbridge Fire Bricks	4	4	0	,, ,, ,,
GLAZED BRICKS.				
Best White and Ivory Glazed Stretchers.....	13	0	0	,, ,, ,,
Headers	12	0	0	,, ,, ,,
Quoins, Bullnose, and Flats	17	0	0	,, ,, ,,
Double Stretchers	19	0	0	,, ,, ,,
Double Headers..	16	0	0	,, ,, ,,
One Side and two Ends	19	0	0	,, ,, ,,
Two Sides and one End	20	0	0	,, ,, ,,
Splays, Chamfered, Squints.....	20	0	0	,, ,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12	0	0	,, ,, ,,
Quoins, Bullnose, and Flats	14	0	0	,, ,, ,,
Double Stretchers	15	0	0	,, ,, ,,
Double Headers..	14	0	0	,, ,, ,,
One Side and two Ends	15	0	0	,, ,, ,,
Two Sides and one End	15	0	0	,, ,, ,,
Splays, Chamfered, Squints.....	14	0	0	,, ,, ,,
Seconds Quality White and Dipped Salt Glazed	2	0	0	,, less than best.
				s. d.
Thames and Pit Sand			7	3 per yard, delivered.
Thames Ballast			6	0 ,, ,,
Best Portland Cement			32	0 per ton, delivered.
Best Ground Blue Lias Lime..	25	0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 28s. od. per ton at rly. dpt.

STONE.

	s.	d.	
Ancaster in blocks	1	11	per ft. cube, deld. rly. depôt.
Bath ,, ...	1	7	,, ,,
Farleigh Down Bath ..	1	8	,, ,,
Beer in blocks	1	6½	,, ,,
Grinshill ,, ...	1	10	,, ,,
Brown Portland in blocks	2	2	,, ,,
Darley Dale in blocks..	2	4	,, ,,
Red Corsehill ,,	2	5	,, ,,
Red Mansfield ,,	2	4	,, ,,
Hard York in blocks ..	2	10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2	8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3	0	,, ,,
,, ,, 5 in. sawn both sides slabs (random sizes)	1	3	,, ,,
,, ,, 2 in. self-faced Ditto	0	9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube. deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2	7	per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1	2½	,, ,,

SLATES.

in.	in.	£	s.	d.	
20×10 best blue Bangor..		11	15	0	per 1000 of 1200 at ry. dep.
,, best seconds	,,	11	5	0	,, ,,
16×8 best	,,	6	12	0	,, ,,
20×10 best blue Portmadoc ..		11	5	0	,, ,,
16×8 best blue Portmadoc		6	0	0	,, ,,
20×10 best Eureka unfading green....		12	2	6	,, ,,
16×8	,, ,,	7	5	0	,, ,,
20×10 permanent green		10	5	0	,, ,,
16×8	,, ,,	5	17	6	,, ,,

TILES.

	s.	d.	
Best plain red roofing tiles..	4	6	per 1,000, at rly. depôt.
Hip and valley tiles....	3	7	per doz. ,, ,,
Best Broseley tiles	48	6	per 1,000 ,, ,,
Hip and valley tiles....	4	0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57	6	per 1,000 ,, ,,
Do. ornamental Do.	60	0	,, ,, ,,
Hip tiles	4	0	per doz. ,, ,,
Valley tiles	3	9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50	9	per 1,000 ,, ,,
Hip tiles	4	1	per doz. ,, ,,
Valley tiles.....	3	8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	13	10	0	15	10	0
Deals: best 3 by 9.....	13	0	0	14	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	10	0	0	11	0	0
Battens: best 2½ by 6 and 3 by 6 ..	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best		
Battens: seconds	0	10	0	,, ,, ,,		
2 in. by 4 in. and 2 in. by 6 in. ..	8	10	0	9	10	0
2 in. by 4½ in. and 2 in by 5 in. ..	8	0	0	9	0	0

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £	s.	d.	£	s.	d.
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0	10	0	more than battens.		
¾ in.	1	0	0	,,		
	At per load of 50 ft.					
Fir timber: Best middling Danzig or Memel (average specification)	4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Swedish balks.....	2	15	0	3	0	0
Pitch-pine timber (30 ft.).....	3	0	0	3	10	0
JOINERS' WOOD.	At per standard.					
White Sea: First yellow deals, 3 in. by 11 in.	22	0	0	23	0	0
3 in. by 9 in.	20	0	0	21	0	0
Battens, 2½ in. and 3 in. by 7 in.	15	0	0	16	0	0
Second yellow deals, 3 in. by 11 in.	17	0	0	18	0	0
,, ,, 3 in. by 9 in.	15	10	0	16	10	0
Battens, 2½ in. and 3 in. by 7 in.	12	0	0	13	0	0
Third yellow deals, 3 in. by 11 in. and 9 in.	12	10	0	13	10	0
Battens, 2½ in. and 3 in. by 7 in.	10	10	0	11	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	19	0	0	20	0	0
Do. 3 in. by 9 in.	16	0	0	17	0	0
Battens.....	12	10	0	13	0	0
Second yellow deals, 3 in. by 11 in.....	14	0	0	15	0	0
Do. 3 in. by 9 in.	13	0	0	14	0	0
Battens.....	11	0	0	12	0	0
Third yellow deals, 3 in. by 11 in.....	11	10	0	12	10	0
Do. 3 in. by 9 in.	11	0	0	12	0	0
Battens.....	10	0	0	11	0	0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	13	10	0	14	10	0
,, ,, ,, 3 in. by 9 in.	12	10	0	13	0	0
Battens.....	10	10	0	11	10	0
Second white deals 3 in. by 11 in.	12	10	0	13	10	0
,, ,, ,, 3 in. by 9 in.	12	0	0	12	10	0
,, ,, ,, battens.....	9	10	0	10	10	0
Pitch-pine: deals	16	0	0	18	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes..	32	0	0	33	10	0
Broads (12 in. and up).....	2	0	0	more.		
Oddments	22	0	0	24	0	0
Seconds, regular sizes	24	10	0	26	10	0
Yellow Pine Oddments	20	0	0	22	0	0
Kauri Pine—Planks, per ft. cube..	0	3	6	0	4	6
Danzig and Stettin Oak Logs— Large, per ft. cube	0	2	6	0	3	0
Small ,, ,, ...	0	2	3	0	2	6
Wainscot Oak Logs, per ft. cube ..	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	8	0	0	7
¾ in. do. do.	0	0	7	-	-	-
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	16	0	0	20	0	0
American Whitewood Planks— Per ft. cube.....	0	3	0	0	3	6
Prepared Flooring—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	0	0	16	6
1 in. by 7 in. yellow, planed and matched	0	13	6	0	17	6
1¼ in. by 7 in. yellow, planed and matched	0	15	0	1	0	0
6 in. at 6d. per square less than 7 in.						
1 in. by 7 in. white, planed and shot	0	11	0	0	12	6
1 in. by 7 in. white, planed and matched	0	11	6	0	13	6
1¼ in. by 7 in. white, planed and matched	0	13	6	0	15	6
6 in. at 6d. per square less than 7 in.						

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	6	5	0	7	5	0
Compound Girders ,, ,,	8	0	0	9	0	0
Angles, Tees and Channels, ordinary sections	8	2	6	9	2	6
Flitch Plates	8	10	0	0	0	0
Cast Iron Columns and Stanchions, including ordinary patterns	7	0	0	8	0	0

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON—						
Common Bars.....	8	0	0	8	10	0
Staffordshire Crown Bars, good merchant quality	8	10	0	9	0	0
Staffordshire "Marked Bars" ..	10	10	0	-	-	
Mild Steel Bars.....	9	0	0	9	10	0
Hoop Iron, basis price.....	9	5	0	9	15	0
,, ,, galvanised.....	16	0	0	-	-	-
(* And upwards, according to size and gauge.)						
Sheet Iron, Black.— Ordinary sizes to 20 g.....	10	0	0	-	-	-
,, ,, to 24 g.....	11	0	0	-	-	-
,, ,, to 26 g.....	12	10	0	-	-	-
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	12	10	0	-	-	-
,, ,, 22 g. and 24 g.	13	0	0	-	-	-
,, ,, 26 g.....	14	0	0	-	-	-
Sheet Iron, Galvanised, flat, best quality :— Ordinary sizes to 20 g.....	16	10	0	-	-	-
,, ,, 22 g. and 24 g.	17	0	0	-	-	-
,, ,, 26 g.....	18	10	0	-	-	-
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12	10	0	-	-	-
,, ,, 22 g. and 24 g.	13	0	0	-	-	-
,, ,, 26 g.	14	0	0	-	-	-

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON—						
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12	5	0	-	-	-
,, ,, 22 g. and 24 g.	13	5	0	-	-	-
,, ,, 26 g.	14	5	0	-	-	-
Cut nails, 3 in. to 6 in.	9	10	0	10	0	0
(Under 3 in. usual trade extras.)						

LEAD, &c.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3 lbs. & up.	13	0	0	-	-	-
Pipe in coils	13	10	0	-	-	-
Soil Pipe.....	16	0	0	-	-	-
ZINC—Sheet—						
Vieille Montagne..... ton	24	10	0	-	-	-
Silesian	24	0	0	-	-	-
COPPER—						
Strong Sheet..... per lb.	0	1	0	-	-	-
Thin ..... ,,	0	1	1½	-	-	-
Copper nails..... ,,	0	1	1½	-	-	-
BRASS—						
Strong Sheet..... ,,	0	0	11	-	-	-
Thin ,, ... ,,	0	1	1	-	-	-
TIN—English Ingots..... ,,	0	1	3	-	-	-
SOLDER—Plumbers' ..... ,,	0	0	6½	-	-	-
Tinmen's ..... ,,	0	0	8	-	-	-
Blowpipe ..... ,,	0	0	9	-	-	-

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths.....	3¼d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, fourths	4¼d. ,, ,,
32 oz. thirds	5¼d. ,, ,,
,, fourths	5¼d. ,, ,,
Fluted sheet, 15 oz.....	3¼d. ,, ,,
,, 21 ,, ...	4¼d. ,, ,,
½ Hartley's Rolled Plate	2½d. ,, ,,
⅜ ,, ,, ,, ...	3d. ,, ,,
¼ ,, ,, ,, ...	3½d. ,, ,,

OILS, &c.

		d
Raw Linseed Oil in pipes.....per gallon	0	2 10
,, ,, ,, in barrels ..... ,,	0	2 11
,, ,, ,, in drums ..... ,,	0	3 1
Boiled ,, ,, in pipes ..... ,,	0	3 0
,, ,, ,, in barrels ..... ,,	0	3 1
,, ,, ,, in drums ..... ,,	0	3 3
Turpentine, in barrels ..... ,,	0	2 3
,, in drums ..... ,,	0	2 6
Genuine Ground English White Lead per ton	21	10 0
Red Lead, Dry..... ,,	21	0 0
Best Linseed Oil Putty ..... per cwt.	0	8 6
Stockholm Tar ..... per barrel	1	12 0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Elastic Copal Varnish for outside work ..	0	16	6
Best Elastic Copal Varnish for outside work ..	1	0	0
Best Elastic Carriage Varnish for outside work	0	16	0
Best Hard Oak Varnish for inside work.....	0	10	6
Best Extra Hard Church Oak Varnish for inside work	0	10	6
Fine Hard Copal Varnish for inside work.....	0	16	0
Best Hard Copal Varnish for inside work.....	1	0	0
Best Hard Carriage Varnish for inside work....	0	16	0
Extra Pale Paper Varnish	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
Best French and Brush Polish	0	10	0

TO CORRESPONDENTS.

A. W. B. (Amount should have been stated).

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

CHINGFORD.—For new house, Rowden Park Estate Chingford, for Mr. J. J. Spencer. Mr. T. Wilson, architect, 24, New Bridge-street, E.C.:—

Wood*..... £750

[*See also next page.*

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CHURSTON FERRERS (Devon).—For the erection of three houses, Galmpton, for Mr. T. B. Bolitho. Mr. W. F. Tollit, architect, Totnes :—

R. E. Narracot, Stoke Gabriel* £784

COLCHESTER.—For the erection of two pairs of cottages on the Tomlinson Estates. Messrs. Start & Rowell, architects, Colchester, and 54, New Broad-street, E.C. :—

Dupont & Co.	£1,238	A. Diss	£1,050
T. J. Ward	1,220	W. Chambers	990
J. Grimes	1,195	R. Beaumont*	920

CORK.—For rebuilding saw mills, for Messrs. Eustace & Co., Limited. Mr. Arthur Hill, architect, 22, Georges-street, Cork. Quantities by Mr. Butler, Dublin :—

M. Lynch	£5,200	Delany & Co.	£4,451
D. Hegarty	4,900	S. Hill	4,380
D. O'Callaghan	4,547	E. & P. O'Flynn* ..	4,360
P. Murphy	4,455		

CROYDON.—For the construction of sewers, Beddington, Coulsdon, and Mitcham, for the Rural District Council. Messrs. Chart, Son, & Reading, surveyors, Union Bank-chambers, Croydon :—

	Beddington.	Coulsdon.	Mitcham.
Pedrette	£4,900 0 0	£2,860 0 0	£3,400 0 0
Hawkins & Co.	2,310 0 0	1,226 19 6	2,135 15 6
Jackson	2,388 0 0	1,566 19 0	1,843 11 0
Manders	2,228 17 2	1,239 18 0	2,053 2 5
Green	2,532 19 8	1,440 19 8	1,392 19 8
Rayner	2,177 10 6	1,231 0 0	1,772 7 0
Johnson & Langley	2,172 0 0	1,282 0 0	1,535 0 0
Killingbeck & Co.	2,197 0 0	1,277 0 0	1,370 0 0
Langridge	2,030 0 0	1,115 0 0	1,532 0 0
Iles	2,066 0 0	1,128 0 0	1,457 0 0
Streeters & Todhunter	1,895 0 0	1,037 6 9	1,332 3 0
Oseuton, Westerham†	1,738 0 0	1,011 0 0	1,292 0 0

HERNE BAY.—For the erection of twenty-five cottages, Minster Drive, for the Central Cottage Building Club. Mr. E. J. Hammond, C.E., 3, Marlborough-buildings, High-street, Herne Bay :—

C. W. Welby	£6,075	C. Jorden	£5,375
E. T. J. Adams	6,050	J. Wilford	5,125
Berry Bros.	5,575	J. F. Thompson	5,125
L. Seager	5,500	C. S. Smillie	4,875
F. Griggs	5,500	A. S. Ingleton, Herne Bay*	4,750

WATFORD.—For the erection of the New Victoria Boys' School, for Watford School Board. Mr. J. Hunt, architect, 40, Upper Baker-street, N.W. :—

S. W. Moscrip ..	£8,856 16	J. Appleby	£7,093 0
G. Wiggs	8,298 0	Varnell & Son....	7,064 0
Dupont & Co.....	8,218 0	C. Eames.....	6,956 0
Holliday & Greenwood, Ltd.	7,929 0	Honour & Son ..	6,933 0
		Clifford & Gough	6,899 0
Smith & Sons, Ltd.	7,519 0	G. & J. Waterman	6,867 0
		Coulson & Lofts..	6,751 18
Tyler & White ..	7,500 0	C. Brightman....	6,638 0
H. Martin	7,308 0	R. L. Tonge, Watford*.....	6,508 0
Martin, Wells, & Co., Ltd.....	7,243 0	R. Morton Hughes	6,461 0
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Beer & Co.....	384 10		
Wontner Smith, Gray, & Co.	377 0		

LONDON.—For the erection of workshop at Great Hermitage-street, Wapping, for Mr. A. W. Birt. Mr. John Parrish, architect and surveyor, Clapton Park, N.E. :—

Alexander Edwards, Cambridge-road* £1,600

NORTHWICH.—For the erection of a house at sewage outfall works, for the Winnington Urban District Council. Messrs. H. Bancroft & Son, C.E., 88, Mosley-street, Manchester :—

T. Appleton, Northwich* £340

WARWICK.—For proposed infirmary at the Warwick Union Workhouse, for the Board of Guardians. Mr. Francis P. Trepess, architect, Warwick. Quantities supplied by the architect :—

Building Estimates.

Fincher & Co.	£15,815 16 0	W. Harvey Gibbs	£13,600 0 0
G. Jackson..	15,618 0 0	Whitehouse & Sons	13,575 0 0
J. Bloxham..	15,212 14 2		
R. Bowen ..	14,999 0 0		
W. Hughins	14,888 7 10	M. Hughes..	13,522 0 0
J. Rowbotham	14,747 0 0	Gowing & Ingram ..	13,509 0 0
Parnell & Son	14,708 0 0	F. Johnson..	13,414 0 0
Lindsay & Son	14,514 15 0	S. Warburton	13,000 0 0
C. Gray Hill	14,352 0 0	Smith & Pitts	12,947 0 0
Thompson Bros.	14,331 0 0	Exors. of C. Garlick ..	12,900 0 0
Smith & Sons	14,300 0 0	W. Faulks ..	12,767 2 3
Pattison & Sons	14,292 0 0	Kelley & Son	12,735 10 0
Giles & Son..	14,196 0 0	Moss & Sons, Ltd., Loughborough*..	12,000 4 1
E. Talliss ..	14,037 18 3		
Broad & Son	13,811 16 10		

Engineering Estimates.

Summerscales & Sons	£3,700 0 0	Williams & Sons, Ltd...	£2,495 2 9
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Dargue, Griffiths, & Co.	3,280 19 6		
Flavel & Co.	3,190 0 0	Dinning & Cooke	2,462 0 0
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The Builder.

VOL. LXXXII.—No. 3976. JANUARY 18, 1902

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Selected Design, Municipal Buildings, Walton-on-Thames ..... Messrs. Macintosh & Newman, Architects.
Palazzo Bevilacqua, Verona ..... Measured and Drawn by Mr. W. Crum Watson.

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Students' Designs at the Institute of Architects.

WE are glad to see that the competitions for the prizes offered by the Institute of Architects for designs by students are beginning to revive, and that this year the competition for the Soane Medallion reminds the elder among us of some of the Soane competitions of old days, which used to produce drawings and designs far superior to those which we have been in the habit of seeing during the last eight or ten years. The prizes which depend mainly upon drawing have indeed always kept their place; the work done for the Pugin and Owen Jones Scholarships and for the Measured Drawings Medal has never materially fallen off; it is in the two prizes which are given for design, the Soane and the Tite, that there has been such a feeble appearance lately, both in regard to the number and the quality of the designs; in fact, there has been more than one year recently in which, in our opinion, the Soane Medallion ought to have been withheld altogether, as a hint to students that something better was expected of them if they would win the leading prize the Institute has to bestow. This year we have, however, sixteen competitors for the Soane and twenty-four for the Tite, and these include a great deal of very good work, and two or three at least which may be called remarkable designs.

The revival of interest and energy over these two competitions may perhaps in great measure be attributed to the fact that the subjects are more interesting from a purely architectural point of view than usual, and that they are such as leave the designers free to consider architectural effect as the principal object. It is nearly always in plan that the Soane competitors have been most deficient; and in the subject for this year, a swimming-bath for a seaside town, to be treated (the interior of the bath especially) in a monumental architectural manner, and in which the "engineering" connected with a swimming-bath was allowed to be ignored, the competitors had a subject of the greatest architectural suggestiveness, while at the same time presenting no great difficulties in planning; and in the case of the Tite prize the plan was furnished to them. A concert-hall, which is a subject that has been twice given for the Soane, and produced very poor results, ought to have been an inspiring one, but the subject is a good deal complicated with difficulties in regard to planning, seating, and acoustics, which seem to have rather deterred competitors. Of course it is not quite right that practical difficulties should be evaded in competitions of this kind, part of the value of which consists in preparing architectural students for the practical problems which they will have to solve in actual practice; but it is exceedingly natural that young architects, to whom architecture still presents the dream of great opportunities of poetic effect, and whose enthusiasm for the art is in full blossom, should feel more drawn towards subjects in which they can develop the full capacity of architecture for effect on a grand scale; and we are not without sympathy with them in this respect.

There could hardly be a finer opportunity for an architect than to be invited to design a great swimming-bath as an architecturally treated hall, regardless of cost, and with the added beauty of the water surface and its effects of reflection. The particular point of the instruction that it was to be "in a seaside town" we do not quite perceive, nor, as far as we noticed, have any of the competitors endeavoured to give special point to this requirement in the character of their designs; it may have been intended as an intimation that it was a locality in which a spacious and open site would be more likely to be found than in an inland town, and that a seaside town would be more or less a pleasure resort, and would therefore give excuse for treating the building in a more than usually decorative and festive manner. Of the designs submitted there can hardly be a question that "Iona" is the finest; it has the advantage of being set off by splendid draughtsmanship, but even putting this aside it is before all the others in general conception, and is a design which would do honour to any architect. For one thing, the author's plan is a distinct and original conception. On the ground floor the two long sides of the design assume the form of two great sweeping curves, which form a loggia on each side for walking; the straight walls of the main swimming-bath forming the chord of the arc. This is really an architectural idea worth note; it is something quite out of the ordinary run of planning: there is a touch of genius in it. The centre part of the space between the curved loggias and the swimming-bath is occupied on one side by the separate private baths, on the other side by a Turkish bath, the remainder of the space being open courts. The entrance-hall and other apartments at one end, and the gymnasium at the other end, form cross blocks at each end of the swimming-bath block, the curved loggias coming into the re-entering angles. The straight side walls of the swimming-bath rise above the lower buildings, and are treated very effectively with large semicircular windows with an order of columns which stand free in front of the two vertical divisions of the windows. It is an unusual treatment to place columns in front of a window of this kind, but we do not see any objection to it, and it has the effect of carrying on the architectural composition across the wide spaces of the windows, and giving the apparent support required to the entablature. Exterior perspectives were not asked for, the interior perspective of the bath presenting quite enough work in itself; it might be a question how the grouping would look in perspective, with the lower curved building in front and the straight wall rising behind it; but at all events the main arrangement of the plan would be completely indicated in the grouping of the building. The small dome over the entrance hall is a very good bit of design. The interior perspective is a very fine drawing showing a circular barrel vault rising from

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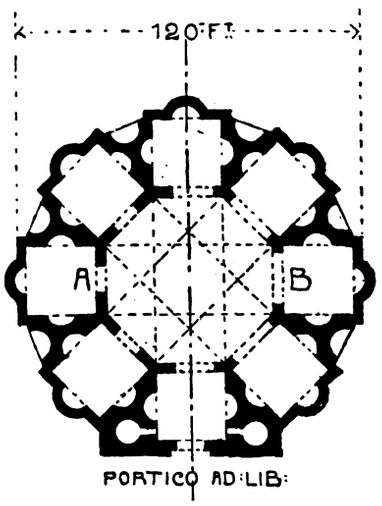
an arcade carried on massive square piers, the coffered arches being shown right back to the external walls, and the side galleries carried in colonnades between the piers; the arches spring from an entablature carried from the large piers to the outer wall, leaving square-heading openings between pier and wall. The piers and vault are richly decorated with sculpture boldly sketched in, the centre portion of the vault being left in panels of plain surface, with the object, no doubt, of getting a white reflecting surface over the centre of the bath. This is so necessary for securing a bright and attractive effect in the water, that it has been rather generally assumed that top-lighting is almost a *sine quâ non* in a swimming-bath, to lighten up the water; and practically this is true, but it must be admitted that in an architectural sense this advantage is secured at the cost of destroying the monumental effect of the roof, and as this was to be a piece of monumental architecture we are inclined to think, as both "Iona" and some other competitors have evidently thought, that side-lighting best meets the architectural conditions. The dressing-boxes are ranged along the outer walls behind the colonnaded screen, and are thus prevented from interfering with the architectural effect, while they are sufficiently close to the water. This is an important point; some of the competitors have hidden the dressing-boxes away too far from the bath; they should be as close to the water as they can be without interfering with gangway room round it, otherwise the bather gets a chill before getting to the water, and the space between the bath and the boxes leaves a great amount of wet floor from the drippings from bathers coming out. Some of the competitors appear to have thought it a good plan to have entrances to the boxes both back and front—a back corridor for coming in dressed and a front door for issue to the bath when undressed; but this is a mistake; dressing-boxes are necessarily small, and to have a door both in front and back is inconvenient, besides promoting draughts. We do not see why "Iona" provided a small "sea-water bath" in his gymnasium block; in a seaside town it stands to reason that the main bath would be supplied with sea-water; we only wish we could get it into our London swimming-baths.

The two next best designs are perhaps "Balneæ" and "Tepidarium." Both of them show somewhat the same general idea as "Iona" in the treatment of the swimming-bath hall—a great side arcade on massive piers, with a semicircular vault. The general effect of the interior of "Balneæ" is very good, though it does not derive much advantage from the drawing, which seems to have been done in a hurry, and the Classic columns which are used (not very happily) in the manner of angle columns to the main piers are disagreeably attenuated in proportion, and have no diminution; they look like Classic columns used in a Gothic manner. The geometrical drawings are however very good and carefully treated, and the building would be a fine one as a whole. It is rather a pity that the author has planned his fine octagonal entrance-hall so as to cut into one side of the bath hall; the junction is cleverly managed, and as the competitors were not limited in regard to space we presume that he considered this as a point in his design, but it must spoil the effect of the bath hall to some extent. The arrangement of the dressing-boxes behind a row of rather wide masonry piers has the effect of subordinating them to the architecture, but it necessitates some of their doors being rather inconveniently narrow. "Tepidarium" shows a somewhat similar idea in the treatment of the hall, but there is a separate column in front of the main piers, and the side arches are not carried back to the outer wall, the gallery having a flat ceiling behind the arcade—not so bold and effective a treatment. The dressing-boxes are



Plan given for the Tite Prize Competition.

better arranged for access than in "Balneæ." The perfectly plain vault, with its "Welsh" groins at the side, looks rather crude in the perspective view, but as a whole this is a very meritorious design.

Among the other designs "Silhouette" shows a fine coloured perspective of the bath hall, somewhat reminiscent of St. Mark's in general effect; it is not very apparent what is intended to be the material of the warm-tinted walls. In the plan the dressing-boxes are badly arranged, facing each other on each side of a narrow corridor; on days of full attendance there would be inconvenient crowding here, and the boxes are not in sufficiently close connexion with the bath. The exterior elevations are good in the main; the chimney is well treated; the transition from the square to the circular plan in the dome is rather crudely managed. In "Io," in many respects a clever design, the bath interior is treated in a dignified and effective manner, with side lighting and a rather heavy segmental-arched ceiling; the plan shows the same mistake as in "Silhouette," of crowding the dressing-boxes on each side of an internal corridor, instead of facing them all towards the bath. "Zeno" shows a very clever design in which brick and coloured faïence are largely used, and the dressing-boxes are divided by columns picturesquely treated; there is a tie-beam roof with a continuous lantern-light down the centre. There is a good deal of ability in this design, but it is hardly what we should call monumental architecture. This is one in which the dressing-boxes are shown between two corridors and with front and back doors, which, as already observed, we regard as a mistake. "Amphibious" is also a ceramic design with much cleverness but somewhat eccentric, and it seems a mistake to put square piers above the gallery carried by coupled columns below, inverting the usual structural order of things; nevertheless, there is a great deal of ability shown in the details. "Faust" is a design which fails by being too clever; the interior architecture of the bath hall is all cut up into bits; a good deal of clever detail, but the whole wants breadth and does not hang together.

The Tite prize is less important than the Soane in so far as it is a study in style only, apart from practical requirements, but we may feel a special satisfaction in seeing that it has been so largely and ably competed for, as there is no harm in saying, now, that the subject was the suggestion of the editor of this journal, who is very glad to find that it has proved so attractive. The problem was to give a treatment, in Italian architecture, of the subjoined plan, which is drawn out from a sketch plan of Leonardo da Vinci's to be found among his miscellaneous architectural sketches and ideas published in a book by Baron de Geymüller. The plan has been familiar to us for many years, and we have long thought it was worth doing something with. Leonardo gives a very rough sketch of his notion of its architectural treatment, which is not worth much, but the plan itself is an original conception, and a very suggestive one. The designs show a very high average of merit, and the award of the prize will, we should think, be a matter of some difficulty. Our own very decided opinion is in favour of that signed "In Memoriam," which, not without weak points, shows more unity of conception and more of architectural genius than any other. The design is treated in a severe and restrained manner; the weak points in it are the curved out buttresses at the base of the coupled columns in the upper story, which want a little more "treatment" to carry them off—they look rather as if the author did not quite know what to put there: and it is a question whether the upper order should not have been on a smaller scale than the portico order; as it is, the upper story seems rather to crush the lower. There is a grandeur, nevertheless, about the whole thing, and the perspective drawing shows a great deal of artistic power. It should be mentioned that the instructions were that the building should be treated as a "Royal Memorial Chapel," an idea which the nature of the plan seemed rather to suggest. Among the other designs there are very few that are not interesting and meritorious more or less; several that are of remarkable excellence. Among these we may mention "Nimrod," a very refined design shown in admirable drawings and with a great deal of very pretty decorative detail, but rather wanting in the solemnity of character proper to a memorial chapel; "Marble," a very good design in Early North Italian Renaissance, with flat surfaces and a good deal of marble inlay; the drawings of this are also admirable. But this is not what Tite intended; his prize was to encourage "The Study of Italian Architecture," and what he meant was Classic Renaissance, and to that phase of architecture, as we have before said, competitors are bound to keep. Not that there should be no original detail, but that the treatment and the effect should be such as are founded on and in harmony with the Classic Renaissance—carrying it further, if you will, but not going back, as "Marble" does, to a

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phase of Italian architecture earlier than that, and essentially different from it. Among other good designs are "Gibbs;" "R. I. P.;" the one marked by a sprig of foliage—the author has rather overdone rustication, but there is a certain power about it; one marked by three red spots, graceful but not very original; "Tendimus," who shows his building finely placed on a terraced platform; "Bramante da Urbino," who is to be credited for the bold and original treatment of the buttresses to the drum of the dome; "Rex," who shows a graceful and severe design, not very striking but very correct; "Pax," in whose design the lower pavilions, with their decorative sculpture, are very effectively and powerfully treated; and "Rex *A*," whose perspective drawing is the best executed in the collection, but the design is very much copied from St. Paul's, and there is no artistic invention about it; only beautiful drawing—which is not the same thing.

Of the six competitors for the Grissell medal the one who signs his drawings with a red fleur-de-lis seems to have best combined a simple and satisfactory treatment of construction with good lighting and a certain eye to architectural effect, a point which must not be lost sight of; for though the medal was instituted for a constructional competition, one must consider that construction the best which, *cæteris paribus*, keeps in mind the requirements of architectural effect and truthfulness in structural expression, without which the competition would become only an engineering one. There are clever points in "Cædmon's" drawings, but they are more those of an engineer than an architect.

The competitions for the prizes in which drawing alone is concerned, excluding original design, must be more briefly noticed. There is unusually large competition for the measured drawings medal and 10*l*. We wish this prize were larger, not because the subject of study needs greater attraction, but as a more suitable recognition of the good work that is done. Such measured drawings as those of Lindisfarne Priory are valuable records of fine Mediæval work, which must, as years pass, grow more and more ruinous, however well conserved. It is a difficult subject—particularly the plan—and it is very well done. "Inca" sends a set of drawings of Houghton Hall, a plain, well-disposed building, designed by Campbell early in the eighteenth century. The subject is rather a dull one for choice, and the interest of sculpture and ornament is rather slurred over. Aston Hall is again represented by "H. T.," and there are two sets of Bolsover Castle, the best being that by "Cavendo Tutus." King Henry's Gate, St. Bartholomew's Hospital, is a good subject well drawn. In all there are twelve sets, and the year is remarkable for there being no Gothic building represented. This is due partly to the prevailing Renaissance phase, and also, we are inclined to think, to the ease with which English Renaissance work can be measured and drawn, compared with English Gothic of the thirteenth and fourteenth centuries.

The Pugin Studentship is given expressly to promote the study of Mediæval architecture, and generally produces excellent studies both in freehand and from measurement, but this year the twelve sets sent in are hardly up to the usual standard. Mr. C. Wontner Smith shows a fine collection of studies, a number of which are not very suitably chosen. We imagine that the drawing of the main western portal of St. Sauveur at Aix, in Provence, was drawn from the cast in South Kensington Museum—at any rate, the stone joints are not shown, and it is therefore useless as a working drawing. His water-colour drawings are good, if somewhat hard, and they seem to be chosen rather more for their picturesqueness than as severe architectural studies in light and shade. Mr. A. Muir has gone in for monochrome brush drawings with success, and his measurement drawings in pencil are well chosen, especially Bishop Bridport's tomb at Salisbury. For direct hasty sketches, those by Mr. J. Harold Gibbons have considerable charm. W. S. A. G. sends drawings in both pencil and ink, the best being the pencil ones. Our advice to students who desire to attain to excellence in draughtsmanship is to study drawing from the round, and to draw direct in pen and ink. The first will teach them the value of light, shade, and shadow; the second will teach proportion and the use of as few lines as possible. The choice of subjects is, of course, most important.

The best single drawing sent in this year for the Owen Jones is that of the Baptistry, Ravenna, by Mr. Edward Bennett. We think the chances of this gentleman winning the prize are somewhat spoiled by his choice of a large coloured enamel, his drawing of which has merit for beautiful colour, but the thing itself is a decadent and worthless piece of art. Mr. James McLachlan also sends a drawing of the Ravenna Baptistry, and a bay of St. Appollinare Nuovo, Ravenna, rather harshly drawn. The remainder of his subjects are very well drawn and well selected, including a beautiful head of St. Catherine of Alexandria, from the church of St. Domenico, Siena. Mr. L. Rome Guthrie has been to Spain, and has made a good drawing of the remarkable wrought iron screen in the Royal Chapel, Granada. He also shows a very true—though slight—perspective study of one of the doorways of St. Mark's, Venice, and a portion of the ceiling from the church of Santa Maria dei Miracoli, Venice, one of the most beautiful cinque-cento churches in Italy. Mr. Percy E. Nobbs has made a careful drawing of the marble wall facing at the west transept of St. Mark's, Venice, and a scheme of mosaic decoration for a church of the form and scale of St. Fosca, at Torcello, showing considerable feeling for colour decoration. Mr. V. T. Cummings and Mr. Ramsay Traquair also show interesting work.

NOTES.

Liverpool Cathedral.

WE are informed that at the last meeting of the Liverpool Corporation Finance Committee it was resolved (one member dissenting) "that so far as that Committee were concerned the preamble of the Liverpool Cathedral Bill be not opposed, and that the Town Clerk, Controller, and Surveyor bring up the heads of agreement as to the transfer of St. James's Mount to the Cathedral Committee." If, however, it is the fact, as we are informed, that three members of the Finance Committee are also members of the Cathedral Committee, one of them being its Hon. Secretary, the significance of this resolution is rather discounted. The matter does not seem to be getting fair or open discussion in Liverpool at all. We have received further complaints as to the action of the leading Liverpool journals, which it appears are ready to print or reprint any letters or remarks favourable to the St. James's Mount site, and refuse to print anything on the other side. It seems to be getting a party or partisan question rather than an architectural one.

The New Admiralty Buildings.

IT is stated that the Departmental authorities have under consideration a further scheme for making an addition to the Admiralty buildings now in progress. At present the foundations are being laid, by Messrs. J. Chessum & Sons, of the block, being the third of the group, which will take the place of the originally proposed gallery or covered way joining the two blocks that have lately been erected upon the Spring Gardens and New-street site, after the plans and designs of Messrs. Leeming & Leeming, architects for the new extensions, and which are already occupied, in part, by the executive staff. Even the sacrifice of the gallery, which would have constituted a pleasing and unwonted feature of the quadrangle as seen from the Horse Guards' Parade-ground, will not, it is apprehended, sufficiently meet the increase of official requirements. There is some probability that at no distant time a site will be cleared for a fourth block of buildings to extend eastwards to Whitehall by the removal of the existing Paymaster-General's Office, which stands between the Horse Guards and the south wing of Ripley's Admiralty at Whitehall. If the whole building were pulled down and a new one erected we should be much better pleased. It might be well worth the expenditure.

Electric Lighting and Settled Estates.

A DECISION of a good deal of practical importance, that of Kinnaird *v.* Treake, is reported in the current number of the official Reports. By the Settled Land Act, 1890, capital may be spent on additions to the estate which are reasonably necessary, and the question arose whether capital sums could be expended on an electric light installation on a number of London houses in South Kensington. It was given in evidence that the houses in question in Cranley-place, Sumner-place, and Onslow-gardens were all unlet, and in order to meet modern requirements it was necessary that they should be fitted with electric light—a noticeable illustration, by the way, of the manner in which electricity is becoming the normal method of illumination in domestic buildings. The application was granted by Mr. Justice Joyce on the ground that the system of lighting fell within the words of the Statute. But he confined his sanction to the wiring of the houses, and would not extend it to fittings such as are usually provided by a tenant. Probably the same point will arise, sooner or later, in regard to country houses, which seem to be on a somewhat different footing. Presently, perhaps, we may have to consider the application of the Settled Land Act to steam heating and efficient ventilation.

The Testing of South London Gas.

THE South Metropolitan Gas Co. seeks power in a bill to be introduced during the present session of Parliament, not only to substitute

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the old method of testing for illuminating power during certain limited hours of the evening for the present system of testing at any hour of the day or night by the more satisfactory table photometer, but also to raise the limit of sulphur impurities during the summer months to 22 grains per 100 cubic feet on an average of six days. A clause is also introduced stipulating that the "testing places shall be those at present in use, one for each station for manufacturing gas, and in case of any change in any such station, the substituted testing place shall be on a leading gas main not less than 18 in. in diameter from which the supply of gas is taken, and at a distance not more than two miles from a manufacturing station." These testing clauses ought to be strenuously opposed by the Local Authorities and gas consumers of South London. The stipulation that the illuminating power of the gas may only be tested after 5 p.m. is ridiculous, unless a heating power test is substituted in the daytime for the illuminating power test. We are not, however, surprised to find that no reference is made to the heating value of the gas. We fail also to see any reason for raising the limit of the sulphur impurities. Other gas companies are able to keep the impurities well below the present statutory limits, and the proposed increase would be a retrograde movement. The stipulation that the testing-place shall not be more than two miles from a manufacturing station is also objectionable. The Company has undertaken to supply a certain district with gas, and should supply every street main in that district with gas of good quality. If the gas deteriorates by travelling, the manufacturing stations should be sufficiently numerous and well distributed to give a satisfactory supply to the entire district. Possibly the company may at a future date decrease the number of gasworks, and produce all their gas at one large station. In such case the provision that there shall be one testing-place for each manufacturing station at a distance of not more than two miles might be convenient for the company, but the present arrangement by which the number and location of the testing places is prescribed by officials appointed by the Board of Trade is better for the consumers.

Telephone Charges in London.

AT the conference of representatives of London local authorities last Monday to consider the question of telephone charges and service, a letter was read from Lord Londonderry in which he points out the few small reductions in the charges which the Post Office have effected. He also stated that the agreement between the Post Office and the National Telephone Co. was not subject to ratification by Parliament. The question seems to us to be rather a mysterious one. Modern telephony is very different from the telephony of even six years ago, yet Mr. A. R. Bennett then advised the London County Council to charge a 10*l.* rate, which would include a 10 per cent. Post Office royalty. The present Post Office charges are almost double that proposed by Mr. Bennett, and hence he must either have made a large error in his calculations or the London public must be grossly overcharged. The conference passed a resolution asking the Lord Mayor to bring the question of the agreements between the National Telephone Co. and the Post Office before the House of Commons in the reply to the King's Speech, so that it may be referred to a Select Committee. It seems to us that the prospects of telephony for the coming year are distinctly bright. At Glasgow there are at present 6,000 subscribers to the Corporation telephones, and new subscribers are coming in at the rate of nearly 200 per week. The National Telephone Co. have greatly improved their service in Glasgow by putting their cables in various of the underground railway tunnels, which they can do without asking the permission of the Corporation. We expect that the Company will not venture to cut rates in Glasgow in the way they are doing at Tunbridge Wells, where they are offering an unlimited service for 4*l.* per annum. It is obvious that this district will soon be one of the best telephone areas in the Kingdom. Portsmouth is going to start a municipal service, and Dublin, Manchester, Brighton, and Hull, all of which have prosperous municipal electric lighting stations, are seriously considering the telephone question.

Brixham Breakwater.

THERE is probably no place in England which retains so completely its immemorial character as a fishing port as Brixham. But modern requirements cannot be dispensed with even by an ancient port, and what is greatly needed at Brixham is the efficient completion of the outer breakwater. Brixham is a secure port except in north-easterly gales, and then it is completely exposed to the sea. The old breakwater, built in 1802, forms a small inner harbour. A new breakwater from Berry Head on the south-west of the port was commenced several years ago. It is still, however, uncompleted, and has the appearance of remaining in this state. If elongated to the north, and efficiently completed, it would give the Brixham trawlers complete protection, and render the port a secure anchorage in all weathers. The small old harbour was suitable enough a century ago; now it is obvious that the completion of the new harbour is urgently required. If the Harbour Commissioners are without funds to complete it, the Government should take up the matter again.

St. Olave's and St. Saviour's Grammar School Foundation.

THE Governors of the Foundation have agreed with the sanction of the Board of Charity Commissioners to effect a sale of the St. Saviour's Grammar School premises for 4,000*l.* The school buildings and dwelling house occupy a site of about 8,000 ft. superficial on the north side of Sumner-street, Southwark, adjoining the Church of St. Peter, which had been given by Dr. Charles Sumner, Bishop of Winchester; they were built of brick with stone dressings from Christopher Edmonds's designs, in 1839, after the domestic Elizabethan style, the cost being defrayed by contributions from the parishioners (1,700*l.*) and the trustees of the local Hyndman Bequest. Mr. W. Campbell Jones has prepared plans and designs for the new girls' school of the Foundation to be erected on the north side of New Kent-road, near Buckenham-square. On June 4, 1562, a charter of incorporation was granted to Queen Elizabeth's Free Grammar School of St. Saviour's, Southwark, as first established by Thomas Cure, the Queen's saddler (*ob.* 1588), and William Emerson (*ob.* 1575), with "some other discreet and more sad inhabitants of St. Saviour's" for thirty boys of both poor and rich parishioners. In "Bygone Southwark," 1895, Mrs. Boger mentions that the founders bought in May, 1562, a part of the Green Dragon, formerly Cobham's Inn, a town mansion of Lord Cobham of Sterborough. Those old buildings, standing on the south side of churchyard, were blown up with gunpowder for staying the course of the fire that consumed much of that quarter of the Borough in May, 1676. The later schoolhouse, which in its turn gave place, 1839, for an extension of the Borough Market, is illustrated in Wilkinson's "Londina" and in the *Mirror* of April 18, 1840. A scheme of the Court of Chancery ratified in 1850 recast the statutes of the foundation, of which the advantages are no longer restricted to resident parishoners, and the income of the charity has materially increased during recent years.

The Fine Art Society.

AT the Fine Art Society's Gallery there is on view a collection of drawings by the late Miss Kate Greenaway, which goes to confirm us in the opinion we expressed in regard to a former exhibition, that this artist's range was very limited, and that she failed in the attempt to produce finished pictures. The only one at least of the larger water-colour drawings here which can be considered a success is the "Boy with Basket of Apples" (57), and even this wants the breadth and freedom of style of true water-colour art; it is more like a decorative picture. Miss Greenaway's real success was in her small drawings for what may be called decorative pages; in these she struck a new vein, and they are charming in their grace and delicacy of design and execution. Did Miss Greenaway study Stothard specially? Her work rather suggests it; she has both his good and bad qualities; his peculiar airy grace in treating small figure groupings, and his bad drawing of figures walking, in which Miss Greenaway fails in exactly the same kind of way. In the middle room at the same gallery is a small but charming collection of water-colour landscapes by Mr. Newton Benett, which are well worth a visit. There is a certain sameness of tone about them; all the subjects seem to be treated, so to speak, in the same key; but they are most delicate and beautiful landscape work, and most conscientiously executed. There is not one among them without its attraction, but among the best may be mentioned "Eton;" "Streatley Mill;" "Fairford Mill;" "The Dean's View, Canterbury;" "Greyfriars, Canterbury;" and "Dorchester Abbey." Mr. Benett, it may be observed, treats old buildings, as in the pictures of the Thames-side mills, with great accuracy and character; in this respect his work should be quite satisfactory to architects.

Isle of Wight Victoria Memorial Competition.

A CORRESPONDENT sends us a copy of the conditions for this competition, which are such that we warn architects against competing. The committee require a design for a memorial to cost not more than 1,000*l.* What competitors are to expect may be gathered from the following quotation from the conditions:—

"A premium of 25*l.* is offered for the accepted design; but if in the opinion of the committee

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none of the designs submitted are found to be suitable such premium may be withheld. The accepted design will, on payment of the said premium, become the property of the committee, *and no commission is to be paid to the competitor on the design being carried out.*

Every design submitted is to include ground plan, elevation, sections, and other details to enable the same to be carried out, and be drawn to a scale of one inch to the foot."

Even if an ordinary building were in question the architect's commission would amount to 50*l.*; but a work such as this memorial must be could not be reckoned as paid for at a 5 per cent. commission; it is decorative work of a special character. The Committee propose therefore that the successful (?) competitor should present them with the whole design and working details of a work of art, at half the charge which would be due to him for carrying out a villa; and (which in the eyes of many will be a more serious injury) propose to carry it out themselves without his supervision. It is stated that a "duly qualified adjudicator" will be appointed to make the award, "if in the opinion of the Committee it is necessary." No "duly qualified" adjudicator would consent to act on such a competition, and we hope no duly qualified architect will enter into it; he will be very foolish if he does.

THE SURVEYORS' INSTITUTION.

ON Monday evening last a meeting of the Surveyors' Institution was held at No. 12, Great George-street, S.W., Sir John Rolleston, M.P., President, in the chair. The minutes having been read and confirmed, and some donations to the Library and Library Fund announced, a paper on "Rivers' Pollution: Purification of Trade Waters from a Mill-Owner's Point of View," was read by Mr. John H. Hanson. The following are the principal portions of the paper:

The question of the purification of the rivers of the country has occupied the attention of Parliament from time to time since the appointment of a Commission, in 1857, to inquire into the best means of preventing the pollution of rivers. At that time rivers and running waters were used as practically the only available means of carrying away the sewage of towns and populous places, as well as the refuse arising from industrial processes and manufactures. The effect of this had been to seriously prejudice the general health of the public, to silt up the bed of many rivers and streams so as to obstruct the natural flow, to interfere with the navigable portions of the rivers, and to cause the flat low-lying lands to become subject to floods, which left deposits of the solid matters.

The object of this Paper is to deal more particularly with that part of the question which relates to the refuse arising from industrial processes and manufactures, as distinct from domestic sewage, and to consider the effect of the legislation on the subject upon the owners and occupiers of works which are brought within the scope of the various Acts of Parliament passed since the report of the Royal Commission in 1867. My experience on the subject has reference more particularly to the Aire and Calder Basin, or the district which is within the special powers of the West Riding of Yorkshire Rivers Act of 1894, where the industries largely consist of the manufacture of cotton, woollen, and worsted cloths, including the dyeing and finishing processes; and at the outset I should like to say that so far as I have been able to gather the opinion of the manufacturers, they do not object to or wish to put difficulties in the way to prevent the purification of the rivers and streams, but they find difficulties which affect them very materially. At the date of the Commission appointed in 1857 the mills and factories in these districts were almost wholly situate on the sides of the rivers and streams, from which water was taken for water-power and also for the various processes of the trade. The Aire and Calder Basin is supplied with water from mountains of millstone grit, largely covered with moorland to the north and west, and it is from this stratification that much of the pure spring water is derived. The chemical character of this water is peculiarly suitable for the several processes of the manufacture of cotton, woollen, and worsted cloths, and in consequence of this and the proximity of coal the trade has settled in these districts.

Many of the manufacturers had gained rights by prescription, as against the riparian owners down stream, to discharge their trade refuse water, as well as ashes and cinders from the firing of the boilers, into the streams, and millions of gallons of fouled trade waters per day, while hundreds of thousands of tons of ashes and solids per annum were put on to the banks and into the beds of the rivers and carried down by the floods to the lower reaches, there to be dredged out by the navigation so as to keep the channel open. In cases where rights had not been gained by lapse of time, the rivers were so polluted that many riparian owners took little trouble to prevent further pollution. So far as the public authorities were concerned, a manufacturer could discharge his effluents into a river without let or hindrance unless he caused a nuisance injurious to health, or damaged a public fishery, &c. Thus, in practice, a manufacturer had an easy means of disposing of his trade waters.

It will be well, perhaps, at this point to refer briefly to the various Acts of Parliament which have been passed since the Commission of 1857, so far as they relate to manufacturers and trade refuse waters.

The Public Health Act, 1875.—Section 21 provides that "the owner or occupier of any premises within the district of a local authority shall be entitled to cause his drains to empty into the sewers of that authority," subject to his giving notice of his intention so to do, and complying with the regulations of the authority as to the mode of connexion. Section 4. "Land and premises are defined to include messuages, buildings, lands, easements, and hereditaments of any tenure," which clearly appears to include factories.

Rivers Pollution Prevention Act, 1876.

By the passing of this Act prescriptive rights to pollute rivers or streams were largely affected, as it was made an offence to put into a stream "any poisonous, noxious, or polluting liquid proceeding from any factory or manufacturing process." But the sweeping effect of this enactment was considerably curtailed by other provisions which clearly showed that Parliament did not intend the Act to be made a means of harassing the manufacturing community, and that the Legislature recognised the importance of interfering as little as possible with the staple trade of the country. With one exception (immaterial to the present Paper) proceedings are only to be taken by a sanitary authority, and then only with the consent of the Local Government Board. Before giving any consent that Board are to "have regard to the industrial interests involved in the case," and to the "circumstances and requirements of the locality," and must further be satisfied that "means for rendering harmless" the polluting liquids "are reasonably practicable and available under all the circumstances of the case, and that no material injury" to the industry involved will result. In other words, the mere fact that polluting liquids are discharged from a factory is not in itself to constitute an offence. Questions of cost to the manufacturer and efficiency of any possible treatment are amongst other matters to be considered by the Local Government Board in connexion with any proposed proceedings.

Local Government Act, 1888.

The Act of 1876 remained practically a dead letter until the Local Government Act of 1888 enabled County Councils to enforce it, and also provided for joint committees of local authorities being formed for the same purpose. In 1891 the Mersey and Irwell Joint Committee and the Ribble Joint Committee were formed, followed two years later by the body now known as the West Riding of Yorkshire Rivers Board. Since then the Mersey and Irwell Joint Committee and the West Riding of Yorkshire Rivers Board have obtained special Acts of Parliament, by which proceedings, under similar restrictions to those contained in the Rivers Pollution Prevention Act of 1876, may be taken in the magistrates' court and penalties recovered without an order being made.

With respect to solids, under the Act of 1892 the manufacturer would be prevented from putting his ashes, &c., in such a position as to render it liable to fall or be carried into a stream. In other respects these special Acts did not materially alter the law, but their enforcement has given rise to great controversy.

The question will suggest itself here: If a millowner can no longer discharge his waste liquids into the streams without fear of litigation, can he not solve the difficulty by passing them into the public sewer?

The answer to this question depends upon the construction put upon the two Acts of Parliament already referred to—viz., the Public Health Act, 1875, and the Rivers Pollution Prevention Act, 1876. Section 21 of the first-mentioned Act, as already stated, empowers the owner or occupier of any premises to empty his drains into the public sewer, and "premises" include factories of all kinds. But it has been contended that a local authority can only be compelled under this Act to receive domestic sewage, and not manufacturing liquids. Apart from other considerations, colour is given to this contention by the fact that Section 7 of the Rivers Pollution Prevention Act (that is to say, a section of an Act passed a year later) declared that facilities should be given by local authorities to enable manufacturers to carry their waste liquids into the public sewers.

The point has been before the courts several times of late years, but the judgments are not so clear as could be desired. Notwithstanding that two of them favour the view that a manufacturer has a right under the Public Health Act to drain into a sewer, yet having regard to the general view of the whole legal situation, it will probably be advisable for mill occupiers to carefully consider the provisions of the Rivers Pollution Prevention Act, 1876, Section 7 of which Act says, every "local authority having sewers under their control, shall give facilities for enabling manufacturers within their district to carry the liquids proceeding from their factories or manufacturing processes into such sewer." So far so good, but these "facilities" are considerably limited by the provisoes that follow.

1. The authority cannot be compelled to receive liquids which prejudicially affect the structure of the sewers.

2. The authority cannot be compelled to receive a liquid which would prejudicially affect the sale or the agricultural application of the sewage. Nowadays cases must be rare which could fall within this restriction so far as regards sale, although it should be borne in mind that a quarter of a century ago, when the Act was passed, it was no doubt more generally thought that sewage might be a marketable commodity.

3. Liquids which, by their temperature or other characteristics, cause a nuisance to health are likewise within the provisoes.

4. Facilities cannot be required when the sewers are only sufficient for taking the ordinary sewage of the district. Undoubtedly this is a ground of refusal behind which a Local Authority may easily shield itself from assisting its largest ratepayers. Moreover, it is by no means clear that in laying down new sewers it is the duty of the Authority under this Act to make provision for trade effluents; and, further, it is not clear that when preparing a scheme for sewerage works provision should be made for trade effluents.

5. The granting of facilities must not interfere with any order of a court respecting the sewage of the district. In other words the taking of trade effluents must not cause the Local Authority to break any order of court ordering them to abstain from the pollution of a stream.

From these provisoes it will be seen that the position of a manufacturer under the Rivers Pollution Prevention Act is much less favourable than it would be under the Public Health Act, if that Act was conclusively and finally held to confer an independent right to discharge trade liquid into the sewers.

But taking matters as they are, let us consider what conditions (if any) a local authority can impose before granting "facilities" under the Act of 1876. In the absence of any direct provision of the legislature on this point it may be assumed that the authority can impose such regulations as may be required to prevent any breach of the provisoes to Section 7 and kindred restrictions. Thus conditions may be made as to the extraction of solids, and for the preliminary treatment of such effluents as

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would otherwise, when in a sewer, cause injury to health, or interfere with the sale of the sewage, or damage the structure of the sewer, &c. In an ordinary way the authority could not demand any monetary consideration for allowing the connexion, but they might do so before they took any effluent which by law they were not bound to take. Perhaps they might also be entitled to lay down reasonable regulations as to the time and mode of discharge.

When a connexion with the sewer has once been permitted or authorised by the Local Authority, the latter will have great difficulty in legally cutting off the same, more especially after the lapse of years.

Shortly, it may be stated that a millowner can be prevented (unless he has acquired prescriptive rights, and whether he can do so or not is, perhaps, doubtful) from discharging into the sewer matters falling within the provisoes to Section 7, or being injurious to health or interfering with the free flow of the sewage. Apart from this the connexion cannot be interfered with. There is one set of cases where even the right of admission to sewers will not avail the millowner. That is where water is taken from a stream for manufacturing purposes; a riparian proprietor lower down may insist on the water being returned after user in order to prevent a diminution of the stream, unless, indeed, a prescriptive right to discharge the water elsewhere than into the stream has been acquired.

The legal position of a manufacturer may be summarised thus :—

1. A millowner can be proceeded against in respect of polluting liquids passing from his premises into a stream, but no proceedings may be taken without the consent of the Local Government Board, and upon the manner in which the Local Government Board construe their duty under this head largely depends the reality or otherwise of the safeguards imposed for the protection of the industries.

2. Even if, as Mr. Justice Charles held, Section 21 of the Public Health Act, 1875, gave an absolute right to discharge trade liquids into the public sewers, this right would appear to be qualified by the Rivers Pollution Prevention Act, 1876, Section 7, and, if so, is subject to the restrictions and limitations contained in the provisoes to that section.

3. If a connexion be once made with the sewer with the consent of the local authority, the latter can only prevent the discharge of such trade effluents through it as cause a breach of one of the above-mentioned provisoes.

As to the first of these positions, Section 11, Sub-section 5, is the clause which was inserted in the West Riding of Yorkshire Rivers Act, 1894, as a protection to "industry or trade," and this section provides that "the Rivers Board shall not take proceedings against any person under this part of this Act, and the Local Government Board shall not give their consent to such proceedings, unless the Rivers Board and the Local Government Board respectively are satisfied, after due inquiry, and having regard to the reasonableness of the cost and the effect on the industry or trade in question, that means for rendering harmless the poisonous, noxious, or polluting liquid are reasonably practicable and available under all the circumstances of the case, and that no material injury will be inflicted by such proceedings on the interests of such industry or trade."

On the face of it this clause appears to afford some protection to the industry, but in practice it is not so. The manufacturer expected that the Local Government Board would require the Rivers Board, who are the prosecutors, to prove their case by showing that "having regard to the reasonableness of the cost and the effect on the industry or trade in question means for rendering harmless the poisonous, noxious, or polluting liquid are reasonably practicable and available under all the circumstances of the case, and that no material injury will be inflicted by such proceedings on the interests of such industry or trade."

Instead of this, however, the Local Government Board throw upon the manufacturer the onus of proving the contrary.

The evidence given by the officials of the Rivers Board at the Local Government Board inquiries under this Act is confined to the following points :—

"1. That the trade liquid is polluting, which is proved by analysis.

2. That means are known for purifying liquids of the like character.

3. That the Rivers Board were not aware of any circumstances why such means should not be applied in the particular case under inquiry."

No evidence is given to show specifically by what process this can be done, or as to what may be the probable capital cost, or the annual cost of continuing the process, so as to enable the inspector to form an opinion as to whether the business can afford to undertake the cost, or will be unable to do so. The importance of this part of the question lies in the fact that the Local Government Board's inquiry is virtually the only opportunity afforded to traders by the Act, of ascertaining the nature and cost of the works and processes to be established and carried out for the purpose of rendering harmless the trade effluents; for whether the conditions of the sub-sections can or cannot be complied with, is a question which cannot be raised before the justices on the prosecution for penalties. When the consent of the Local Government Board has been given the only evidence required to be given before the justices is as to the fact of pollution. So that, practically, the only thing left for a manufacturer to do is to put down a plant and purify his trade waters before discharging them into either the river or into the public sewer. This involves the manufacturers and the trade generally in a very serious financial responsibility. In cases known to me, the annual cost of treating the trade waters would amount to more than the full rateable value of the works. This new tax upon the trade must be admitted to be a very serious one, and has caused considerable anxiety and trouble in the districts where the Acts are being enforced by Boards established for the purpose, such as is the case in the West Riding of Yorkshire.

But this feature of the position is not the only one the manufacturer complains of. Any new imposition which may fall upon a particular trade or industry, although not welcomed by the trade in these days when foreign competition is being so severely felt, is yet robbed of a ground for serious objection and complaint if it falls equally upon all engaged in the trade.

The following figures will show the position I refer to :—

—	No. of Manufactories discharging into Public Sewers.	No. of Manufactories discharging into Rivers and Streams.	Total.
Mersey and Irwell District	250	413	663
West Riding of Yorkshire	751	1,249	2,000
	1,001	1,662	2,663

By these figures it will be seen that out of 2,663 manufactories in these two districts, 1,001 are discharging their trade waters into the public sewers, and so escaping the cost and responsibility which falls upon the remaining 1,662 manufacturers, who discharge into the rivers and streams.

The effect of this is, that some manufacturers who are not connected to the public sewer, making the same class of goods as their neighbours who are connected to the public sewer, which goods have to be sold probably to the same buyer, or at all events in the same market, have not only to bear the expense of purifying their own trade waters, but contribute largely through the rates towards the cost of purifying those of their neighbours and competitors.

Thirty-eight per cent. of the trade get off practically scot free, and 62 per cent. have to bear a tax of, on the average, 10s. to 12s. in the £, and contribute, in addition, to rates which are increased by the advantageous position occupied by 38 per cent. of their competitors.

This seems to be fair ground for complaint. The manufacturers whose works are upon the stream have in times past been considered to occupy a position of great advantage by reason of the facilities for disposing of their fouled trade waters. That advantage has been taken away by the legislature, and they are now handicapped by a serious financial responsibility.

In other words, the liability to purify the trade waters in some cases renders the works, as such, of no value whatever, and this, with the uncertainty of being able to satisfy the officials of the Rivers Board (no standard of purity having been fixed), makes it advisable in some cases to close the premises and move into a district where the Sanitary Authority admits all fouled waters into the public sewers.

A most discouraging and unsatisfactory condition, which at the outset faces a manufacturer, is the fact that the known methods of dealing with trade waters, so as to render them fit to be discharged into a running stream, with a reasonable prospect of satisfying the Rivers Board, are only in the experimental stage, and the manufacturer has reason to fear that after he has expended his capital, he may be called upon to enter upon further capital expenditure by altering or extending his works so as to bring his effluent up to a standard of purity which may be raised from time to time. In the Mersey and Irwell district, out of 398 works which were constructed between 1893 and 1898, 144 were declared to be "not efficient."

Generally, the position seems to be that, prior to 1875, manufacturers were on an equal footing with respect to their trade waters. One section of them discharged into the rivers and streams, and the other into public sewers, neither having financial responsibility with reference to such discharge. Parliament then by the Act of 1876—if its true construction is that it limits the right which, according to Mr. Justice Charles, was conferred by Section 21 of the Public Health Act, 1875—practically confiscated the rights of those who discharged into the rivers and streams, for the provisoes attached to Section 7 of the Act of 1876 are really prohibitive. The whole question is a very difficult one, and objections can be taken to almost any remedy that can be suggested; but it does seem that the simple plan would be to put upon Sanitary Authorities the duty of receiving into their sewers all trade refuse waters, and so placing all manufacturers upon an equality, and letting the cost fall on the community, who benefit by the existence of the works which produce the trade waters.

Mr. Vernon, in proposing a vote of thanks to Mr. Hanson, said the Paper was a most interesting one, and the case had been clearly put from a mill-owner's point of view. All mill-owners had a difficulty in disposing of their trade refuse, and the law governing such disposal was irregular in its application. But it was obvious that districts must be treated differently, having regard to the natural features of the locality, and it was therefore necessary to allow room for the exercise of discretion to those whose duty it was to administer the law. He called to mind a river in Yorkshire on whose banks are a large number of mills, which was quite innocent of foliage, and he did not think that a mill in a place such as that should be placed under the same restrictions as one situated amid beautiful surroundings. Nevertheless, there was sometimes too little attention paid to trade wants, and at other times they were allowed to benefit at the expense of the remainder of the ratepayers. Mr. Hanson had cited the case of a mill having to dispose of 400,000 gallons of refuse water daily, and it certainly seemed unfair to call on the ratepayers, who had nothing to do with the manufactory, to provide a means of disposing of this enormous quantity of water. He did not regard the system of admitting trade effluent to the public sewers where land treatment was adopted as a success, because certain chemicals in a short time filled up the pores of the gravel and rendered it unfit for its purpose. They all looked to science, which had made such strides recently, to solve the problem, as it had already aided the gas factors, and enabled them to turn to excellent account those products which were formerly regarded as being not only useless, but a nuisance.

Colonel Jones said that the opinion he had held for many years was that land only was the proper mode of treating sewage, and the interim report of the Royal Commission recently issued supported his theory. It must be remembered that the country is so dependent on trade that in all legislation its interests must be considered. From the statistics supplied by Mr. Hanson it was seen that of the works which mill-owners had been compelled to erect for the purification of trade refuse nearly 40 per cent. were now declared to be failures, and this was very hard on the owners. He agreed with Mr. Vernon that their greatest hope of a satisfactory solution of the difficulty rested on the profitable realisation of waste waters, which the rapid advance of

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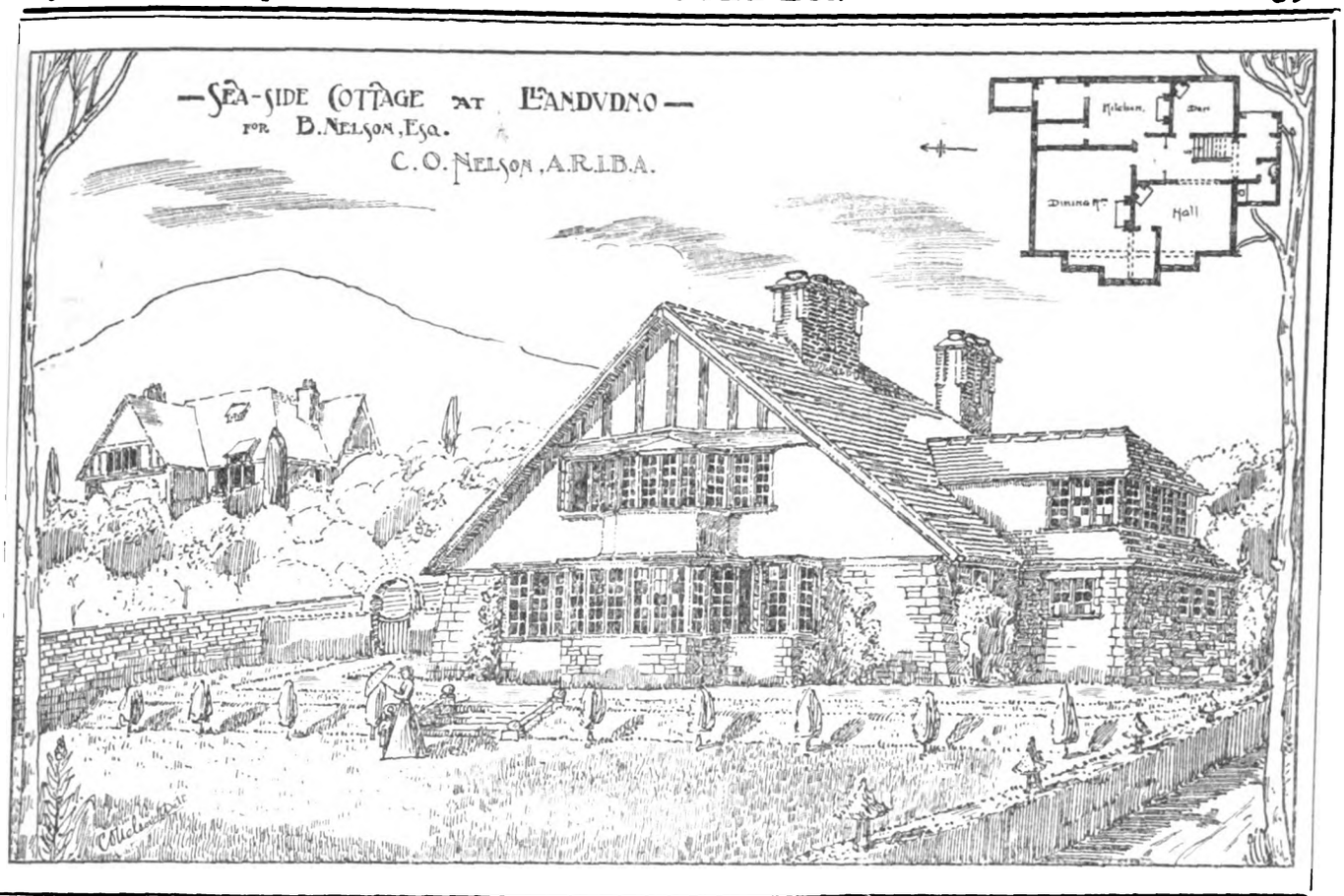

science gave them reasonable cause to consider a possibility of the near future. He had pleasure in seconding the vote of thanks.

Mr. Stephen said there were certain trade centres dedicated to profit, and it was undeniable that people went to those centres, and by doing so went also to the nuisance, and that the nuisance was not brought to them. There should be a marked distinction made between those waste products that are injurious to health and those that are not, and the public should be educated to appreciate the dangers arising from the refuse of various trades. No epidemic could be spread by the effluent from a dye works, but, on the contrary, the strong acids must tend to destroy the germs of disease, and, consequently, a certain elasticity in the law was necessary to enable each case to be dealt with on its merits. There was far greater injury done to health by the poisonous gases contained in the air of a manufacturing district, which we are bound to breathe, than by impure water which we are not bound to drink. Any interference with the manufacturer's working tended to paralyse trade, and to kill industry was to kill the town; for this reason legislation was attended with considerable difficulty. The cost of works for the purification of trade refuse seemed heavy, but, compared with the amount of injury done to private property by trade effluents and the invasion of beautiful districts by noxious gases, it was small. The essential point was that a mill-owner should not be compelled to erect works until it had been proved that the system of purification to be adopted was successful.

The Chairman said the first Paper he ever listened to in that Institution was on the same subject as that they had just heard, and was read by his predecessor in office, Mr. John Shaw, who, he knew they would all be glad to hear, had now been completely restored to health. Since that time much had been done to prevent pollution of rivers. He remembered an action brought by the owner of an estate situated some distance below a galvanised iron and steel works, because his swans were painted yellow below the water-line by the effluent from these works and presented such a horrible appearance when they came ashore. This river was now pure. Although the cost to manufacturers to purify their refuse was heavy, it certainly did not seem right that the stream, from mill to sea, should be polluted.

The vote of thanks was then put to the meeting and carried unanimously.

Mr. Hanson, in reply, said he wished it to be understood that neither he nor the manufacturers desired the present condition of the rivers to continue. They recognised the need of improvement, but required some reasonable guarantee that when money was expended it should be on effective work and have some limit to it. He remembered a statement in the House of Commons by the Member for Barry to the effect that the manufacturers of Lancashire had spent 2,000,000*l.* on works for the purification of refuse, and the rivers were not 5*s.* better for it. He was convinced that scientific investigation would result in a method of purification without unduly affecting manufacturers. The bacterial treatment could not be utilised for purification of trade waters, as bacteria could not live in some strong chemicals, and 10,000*l.* had been expended by Leeds in one year on experiments, without satisfactory results.

The meeting then terminated.

COTTAGE, LLANDUDNO.

THE drawing shows a small seaside residence to be erected at Llandudno on a site near Little Orme, having splendid views of sea and mountains. It will be built of local blue limestone, with brick lining and rough cast, with grey slates. Mr. C. O. Nelson, of London, is the architect.

MAGAZINES AND REVIEWS.

THE *Art Journal* contains an article by Mr. Heywood Sumner on "Sgraffito as a Method of Wall Decoration." This is essentially a practical article—what the author calls a "dull" one, but it is exceedingly useful as a description of the details of the process, by an artist who has had large experience in it. There are some remarks at the close, however, as to the artistic possibilities of sgraffito, depending on "simplicity of expression and a rigid selection of your graphic materials" . . . . "you must welcome line as your means of expression, and instead of aiming at an impossible realism, you must try to find the vitally expressive line, the essential character, movement, posture, growth and colour; in short, the graphic generalisation of the natural forms with which your decoration is concerned." This could not be summed up better. Several interesting illustrations accompany the article. The number includes an article on Sir Thomas Lawrence, by Mr. G. D. Leslie and Mr. F. A. Eaton, with numerous illustrations from his graceful but hardly great works in portraiture.

In the *Magazine of Art* an article on Miss Kate Greenaway's work gives us reproductions from a number of charming little studies from life. Mr. Spielmann, who writes the article, says that what Kate Greenaway did with her modest pencil was to revolutionise one form of book illustration, and to dress the children of two continents. This is a happy and true *résumé* of her artistic position and powers, and does not claim too much. Miss Greenaway was, it appears, a poet as well as an artist, and a sonnet of hers given at the close of the article is very beautiful in feeling, though not quite perfect in versification. An article on "English Pictures in France" describes the collection of one Frenchman, M. Chéramy, who appears to possess some good Constables (better examples, we are told, than any in the Louvre), besides examples of Turner and Bonington. The frontispiece of the number is a reproduction of Mr. Arnesby Brown's "Morning," bought with the Chantrey fund.

In the *Berliner Architekturwelt* the illustrations of some competition designs for a Wagner Memorial for Berlin are very interesting, and show a good deal of power and originality. The second-prize design (Herr Freese, sculptor, and Herr Brurein, architect) shows the composer enthroned in the centre of an exedra formed by a flanking wall with a half return at each end; at the extremity of each return is a heavily-draped female figure in a musing attitude; the one on the right of the spectator, of which a larger illustration is given, is very fine. The third-premium design, by Herr Hoseus, shows a bronze equestrian statue of an armed knight with a lyre, on a lofty pedestal; the bust of the composer is placed below in a niche in the front of the pedestal; the equestrian group is in a grand and forcible style, but the whole design is deficient in simplicity and unity of treatment in the accessories, and in this respect very inferior to the second premium design, which is one of unusual dignity and intellectual interest. The illustrations of the Children's Hospital, by Herr Hoffmann, in the same issue, are interesting, but no plan is given.

The *Architektonische Rundschau* (vol. xviii., part 3) contains as usual a great variety of illustrations of continental work (nothing English seems to get into it), but nothing that is worth special comment, unless it be the view of the interior of a swimming bath by Herr Hoffmann, of Berlin, which shows some novelty of treatment both in general design and in the carved decoration, which, though a little *bizarre*, is far more interesting than anything

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of the kind that could be found in any London swimming bath.

Among the contents of the *Artist* is an article on a Spanish artist, Senor Moreno Carbonero, who appears to have directed his attention largely to illustrating Don Quixote and Gil Blas with a great deal of dramatic vigour. A short article calls attention to a very important subject—the necessity for improvement in our street decoration on such occasions as a coronation. The writer says truly—

"In June next will swarm from every quarter of the globe sons and daughters of every colony and dependency eager to see the crowning of the King, and also to see what the old mother of all of them, one who should be their leader in matters of taste and cultivation, can do to pay his Majesty honour as he passes.

It would be a strange thing indeed if most of them should go home again, saying that the Old Country was behind them, at least in the decoration of their streets; that they themselves had done far better when the Prince and Princess of Wales had visited them; that a Canadian, for instance, should say, 'The Dominion was represented by a flag or so, a motto or two, huddled amongst yards of red calico'; and so all the others.

We put up all this trumpery because it has become customary, and because it saves a great deal of thought and trouble to be able to go to a shop and order our houses to be done, and to leave it to the people of the shop to do it as they please; but it is not because we could not get it well done, and probably for no greater cost, if we chose."

When we think of what kind of public decorations are carried out in Paris, for instance, on the occasion of a visit of some reigning Sovereign, we ought to stir ourselves up to do, for the coronation of our own Sovereign, something better and more complete than has hitherto been seen in London.

In the *Contemporary Review* Mr. Clement Edwards writes on the question "Do Trade Unions Limit Output?" obviously from the trade-unions' point of view. He makes some points in favour of the trade-unions, but any one who reads between the lines will see, as we have seen in other cases, that even their own champions are sometimes obliged to fall back on the unsatisfactory argument that "it is not all our fault." The author says—

"The general trade-union attitude toward apprentices I believe to be necessary for maintaining their minimum wage, and therefore in the best ultimate interests of the trades."

Apprenticeship is the best way of learning a trade, but that is of no consequence; the object is not to learn the trade in the best way, but to keep up wages. That is all the argument amounts to; and a very significant one it is, and goes a good way towards giving away the defence.

The *Nineteenth Century* contains another article on the same subject—"British Labour: a Workman's View," by Mr. James G. Hutchinson, who, we gather, is or has been himself a working man. His opinion is that both inside and outside of trades-unionism there are workmen who will not, if they can help it, do a fair day's work, and that the influence of the trades-unions in the matter is "negligible," in support of which he gives some facts out of his own experience. He says however, on another page, "as a workman I must admit that the workmen, taking them generally, do 'go easy;' while, on the other hand, it is equally obvious that the employers have been very shortsighted in their policy to allow the workmen, *through their unions, to get so palpably the upper hand*." The italics are ours, and need no comment. The article is a very fairly written one, much more so than most utterances on the subject which we have come across; and the following passage is worth special attention, as emphasising a factor in the case which has been rather overlooked:—

"In any comparisons between workshop conditions and practice thirty or forty years ago and the present time allowance should be made for the great change which has come between the master and workman in their industrial relations. At the former period—even in the large workshops to which the best operatives naturally gravitate—the workman would invariably come in close contact with, and be known personally to, his employer; and often this fact alone, independent of the 'master's eye,' was a great incentive to increased effort on his part, in the hope and determination of deserving and winning advancement. While at the present time, even in some of the same shops, the employer has got too big a man to personally conduct his own business, with the result that the workman is entirely at the mercy of the managers and foremen, who too often, not caring to encourage individual effort in this direction, show favouritism to their own friends and partisans rather than further their employer's interest in the selection and retention of the best workmen; and thus the superior craftsman, with a laudable ambition to raise himself, is handicapped and pushed from pillar to post, until, wearied with waiting for opportunities which do not arise, *he makes them*, either by taking a position as foreman or starting in business on his own account."

In reference to the same subject the reader may be advised to look at Mr. G. J. Holyoake's article in the *Fortnightly Review*—"Higher Co-operation: its Inner History." The article deals with other subjects than the position of the working-man, but the author speaks strongly in favour of the principle of giving the working-man an interest in the profits of the firm. "One merit of participation is that it inspires workmen with higher aims," as we have no doubt it should do.

"The dislike to admit workmen to a share of consultative and suggestive control arises from reluctance to recognise administrative equality in the workman—not seeing that gain lies that way. A workman observes costly mistakes made which he could avoid. He knows of time-saving and money-saving devices upon which he is silent, because it is not his interest to disclose them. Were he to speak, it would probably be resented as interference and presumption. A colliery owner at Normanton owned that his men, by care and vigilance, could save him 3,000*l*. a year. The answer given him was, 'Why not give them 1,500*l*, and you will save 1,500*l*. by the concession?' which he did. Let workmen be *assured* that profit will fall to them if they put thought and character into their work, and in time they will do so."

The same magazine contains a very interesting article by a French contributor, M. Georges Bourdon; on "Staging in French and English Theatres." English readers may be surprised (and agreeably surprised) to find that a French critic on the subject considers that our theatres are at the present moment far in advance of the best French houses in stage machinery and in the artistic mounting of plays, and that more trouble and expense is gone into with this object in London than in Paris. The facts given seem entirely to bear out this view.

The *Engineering Magazine* contains a very useful article by Mr. Jacques Boyer on "Practical Applications of Re-inforced Concrete," which reviews several recent forms of combining iron and concrete (among others the Cottançin system described in our last issue), giving diagrams of the various methods of construction. "The Home Environment of British Working-men," by Mr. Percy Longmuir, touches again on the British trade question, from a new standpoint. He thinks the charge against the trade-unions overdrawn:

"The dominating policy of trades unionism has undoubtedly restricted the expansion of British trade; but, in all honesty, can the extremely rapid development of the United States, for instance, be traced solely to the absence of this hindrance? May there not be in addition to the restrictive union policy, other causes at work in Britain which limit progress and effectually bar advance? Is there not room for improvement in British commercial methods, and in the education of employer, workman, and merchant? Are the present conditions of British works, their management, and their workmen, such as will result in an ever-increasing standard of efficiency, combined with a low or decreasing cost of production, in an article which must meet competition in home and foreign markets alike?"

The general tendency of the article is to the effect that employers must think more of ameliorating the condition, circumstances, and opportunities of education of the working men, if they wished to get the best out of them. An article on the Isthmian Canal, by General Abbot, goes to show that the Panama route, whatever its difficulties, is more practicable than the Nicaragua route, and more likely, if the canal were once made, to be a permanent success. Other articles in the issue are on "European and American Steam Engineering," "The Rotary Converter," and "Isolated Electric Plants." The latter, by Mr. Isaac D. Parsons, is an inquiry into the relative cost of generating electricity in an isolated plant or procuring it from a central station. The subject is to be continued in a future number.

A thoughtful article by Mr. W. R. Cooper on the "Production of Electrical Energy from Carbon," appears in *Feilden's Magazine*. He points out that the commercial value of a carbon consuming battery, supposing one were discovered in which the carbon is efficiently consumed, and the cost of the other constituents small, would not be nearly so great as is generally supposed. Taking the average costs of the generation and distribution of electric power from a central station, he finds that the cost of the coal amounts only to 18·5 per cent. of the total costs. Hence, even if a perfect carbon battery were invented which would consume only about one twelfth the present amount of fuel the total saving would only be 17 per cent. This percentage would not make much difference in the cost of the electric light to the consumer, and would certainly not revolutionise the industry. Clear diagrams and descriptions are given of the Jacques cell and the Blumenberg cell, and various defects in their design are mentioned. Mr. Cooper thinks that the extravagant claims made by Jacques for his cell are little likely to be realised. Another article in the same magazine is on the Vattellina Electric Railway, which was so much discussed in the arbitration case on the Underground Electric Railway. This railway is 66 miles long, and is operated electrically from a power station which distributes current at 20,000 volts to various sub-stations, where it is converted down to 3,000 volts, at which pressure it is collected from the trolley wires by aluminium rollers, and taken direct to the motors on the locomotives. The passenger trains run at forty miles per hour when the gradient is not more than 10 per cent., and at steeper gradients they run at twenty miles per hour, the motors being put in cascade. Very special precautions have had to be taken to guard the line against lightning. The working of this railway will be watched with great interest by engineers, as it seems likely to be the type of railway that will be used in the future. The article is illustrated with interesting photographs. Another electrical article in this magazine deserving of mention is the description of the electrical power installation at Palmer's shipbuilding works. This is specially interesting, as it is one of the first large three-phase plants to be laid down in this country, and it seems to us that this system of driving machines and operating tools in factories could be adopted with advantage wherever a private power-house has to be built.

An interesting article in the *Antiquary* is Mr. Clephan's on "Ancient Egyptian Beads and Symbols," founded on examples in the writer's own collection. Dr. Cox gives a sympathetic review of Mr. Banister Fletcher's "History of Architecture." There is also an article by Mr. Miller Christy and Mr. W. W. Porteous on "Some Essex Brasses Illustrative of Elizabethan Costume," with illustrations. Amongst "Notes of the Month" we read that the works in course of being carried out on the canal at Treves continue to bring to light Roman antiquities. About the middle of November a fine tessellated pavement was discovered at a depth of about four yards. It showed two medallions, with representations in one of a woman holding a vase and spear, in the other of two lions. The pavement will be removed to the Provincial Museum.

Harper's Magazine contains the first popular article we have ever seen on what may be called theoretical geometry—"The Fairy-land of Geometry" is the title, and it is an attempt by Dr. Simon Newcomb to convey to general readers some idea of the reasoning of higher mathematicians on the subject of the fourth dimension and the non-Euclidian theory of space and of parallel lines. It is at all events very interesting reading on a subject which has a fascination for many minds. Mr. Sydney Brooks compares London and New York, socially, architecturally, and in other respects, and comes to the conclusion that the one is meant as the complement to the other, and that "the ideal city is only to be constructed by mingling the best points of both." New York, he admits, represents "an undisguised triumph of mechanics over æsthetics" which makes it, for an Englishman, "rather a deadening city to live in." That is a consoling reflection, as coming from an American publication.

Scribner, under "The Field of Art," gives a description of the colour scheme of the Buffalo Exhibition buildings; the first time, says the writer (and author of the scheme), Mr. C. Y. Turner, that, to his knowledge, a general scheme of colour has been undertaken and carried out in any exhibition of the kind. The following passage gives an idea of what was aimed at:

"The tower alone of all the buildings is treated with metallic gold in considerable abundance, and

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its panels have received the brightest blue-green we could procure. All this is intended to suggest the colour and the brilliancy of the water at the crest of Niagara Falls. The statuary is treated in white, as it was my belief that this would form a pleasant contrast and make the colour more apparent. Lamps and urns are treated as green bronze, and the flagstaffs are treated in a similar way, except the greater ones, which have been made to harmonise with the buildings in their immediate neighbourhood—cool at the north ends of the grounds and warmer in colour at the south. The great piers at the entrance, and which support sculptured groups, are soft, warm grey, but the neighbouring pergolas being small in their parts, slender and light, are treated in much brighter colours. The notes of green, gold, ivory, blue, and red are distributed throughout all the buildings, so that the remark was just which a critic made to me: 'I see you are using the Pan-American colours on buildings—red, white, blue, green, and yellow.'"

The *Pall Mall Magazine* includes an article by Mr. H. G. Archer on "Tunnelling the Alps," illustrated by photographs by the author; the subject is treated (naturally) rather from the picturesque than the engineering point of view. "The Strange Story of the Portland Vase" is told by Mr. A. W. Jarvis, and will interest those to whom it is not already known. Some good illustrations of the figure subjects on the vase are given.

We have received the *Revue Générale* and the *Gentleman's Magazine*, which this month contain nothing of special interest to our readers.

ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

THE sixth meeting of the Discussion Section of the Architectural Association for this session was held at 56, Great Marlborough-street, W., on the 10th inst., when Mr. P. W. Mulready read a paper entitled "The Work and Influence of Augustus Welby Pugin." The author dealt with the subject in a most interesting manner under the following headings, viz.:—

1. Introductory.
2. Biographical sketch.
3. Notice of his works.
4. His connexion with the Houses of Parliament.
5. His literary work.
6. His principles, and the changes they wrought in architecture.
7. His principles applied to to-day.
8. The character of Augustus Welby Pugin.

The paper was illustrated with a number of original drawings and some of Pugin's early sketch-books, which had been very kindly lent by Mr. Peter Paul Pugin and Mr. Pugin Powell, and were of great interest and value in showing the remarkable power of draughtsmanship possessed by the great Gothic architect.

The discussion was opened by Mr. Geoffry Lucas, who proposed a vote of thanks to the author and remarked that the influence of early life was very pronounced in the character of Augustus Welby Pugin, who was fortunate in being the son of an architect. It was pleasing to hear such definite statements from the reader of the paper concerning Pugin's connexion with the Houses of Parliament.

Mr. P. Turner, in seconding the vote of thanks, said he was sorry the question of the Houses of Parliament had been raised, as he thought it had been settled that Sir Charles Barry was entitled to the credit of being the architect of those fine buildings.

Mr. E. W. Davis, in supporting the vote of thanks, spoke of the high ideals of Augustus Welby Pugin and his remarkable industry.

Mr. R. H. Weymouth, Chairman, said there was undoubtedly room enough for the talent of both great men in the designing of such a magnificent work as the Houses of Parliament. He wished to draw attention to the simple expressive drawings which had been so kindly lent for the purposes of this meeting, and compare the draughtsmanship with that employed by some men of to-day. It was a great pleasure to the members of the Discussion Section to have their President and Vice-President with them on this occasion, also their good friend, the Editor of the *Builder*.

Mr. Statham said he had listened to the paper with much pleasure. In regard to the connexion between Pugin's religious architectural faith, he remembered a letter in which Pugin said, "I am just completing a fine church" (mentioning the place), "and when it is finished I think I shall become a Catholic"—or words to that effect. The great point in Pugin's churches was the effect of loftiness which he obtained in the interior, by carrying up the arcade to the greatest possible height, with only a small clearstory above it. The drawback was that much of the detail was plaster, as Browning had pointed out in some humorous lines in "Bishop Blougram's Apology."

Mr. Fellowes Prynne said it was extremely pleasing to hear such a good word for Gothic architecture. It always seemed to him that the work of Augustus Welby Pugin showed a great earnestness and directness of purpose as well as enthusiasm.

Mr. Howard Seth-Smith, the President of the Architectural Association, was then called upon by the Chairman to sum up the discussion, which he did in a most interesting manner. He wished to emphasise the importance of carefully studying Gothic work. He looked forward to the time when all schools of architecture would adopt the principles of Augustus Welby Pugin. It was interesting to note the enormous amount of care devoted to the details of subordinate work. Apart from religion, he thought, no great art had risen to sublimity, and it was noteworthy to remark the earnestness and devotion displayed by Pugin.

The vote of thanks to the author for his paper, to Messrs. Peter Paul Pugin and Pugin Powell for the loans of drawings, and to Messrs. H. H. Statham, Fellowes Prynne, and Howard Seth-Smith for so kindly attending as special Visitors, was passed with acclamation. Mr. Mulready having replied, the meeting terminated.

It was announced that the next meeting would be held on the 24th inst., when Mr. F. G. W. Buss will read a paper on "The Clerk of Works: His Duties and Responsibilities."

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—The fourth meeting of the winter session was held at 44, Mosley-street, on Thursday, January 9, Mr. A. Darbyshire, President, in the chair, when Mr. J. D. Crace read a paper on the "Relation of Colour to Architecture." Colour decoration, he observed, included the highest works of pictorial art, but its limit was less wide than this. Colour decoration was the distribution of colour, whether in masses, bands, lines, or pictures, so far as it concerned the beauty of the structure or the purpose for which it was applied. The attitude of the decorator must be one of respect for the structural beauty of his subject. He must consider how his work would affect the architect's intention, for he could either aid or utterly annihilate the charm of the architecture. The decorative value of such work, moreover, was not always in direct proportion with the form of the artist. The decorative artist could not rely on examples of the past, he must continually have recourse to Nature for examples. He must remember, too, that he was the servant of the architect, and have some knowledge of architecture, so that he could sympathise with the idea of the architect, or he would fail to help him. He illustrated how the old decorators used to place a band of dark colour by the sides of the ribs of vaulted roofs, or the pictorial decorations would have a tendency to divert the eye from the ribs, and thus destroy expression of stability in the building. The eye must recognise the essential stability and the method of the structure, or the whole would be full of indecision and the sense of repose destroyed. In the decoration of horizontal roofs there was a danger of them being given the appearance of sagging. This was to be avoided by balancing the colour; by placing the darker or heavier colours in the corners, and marking in the panels by the heavier colours, giving the idea of stability and destroying the appearance of sagging. At the close of the paper Mr. Crace went round the room and pointed out the special points of interest in the numerous coloured drawings he had prepared of internal decorations.—The paper which should have been read by Mr. Halsey Ricardo on "The Revival of Gothic Architecture" at the last meeting is postponed, as on the date arranged for the paper (December 12) the train service between London and Manchester was upset by snowstorms. The monthly prize for a design for a shop was won by Mr. Claude Paterson. The November subject for a band stand was won by Mr. H. Solomon.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The usual monthly meeting of this Society was held on the 9th inst. in the lecture hall of the Literary and Philosophical Society, Leopold-street. Mr. P. Marshall presided. It was announced that the Society's prizes, for the best set of measured drawings of buildings within the Society's district had been awarded as follows:—1st prize, Mr. G. R. Norris; 2nd prize, Mr. D. B. Jenkinson. The whole of the drawings submitted were on view, and were afterwards criticised by Mr. C. Hadfield. Mr. William Watts, F.G.S., M.I.M.E., then delivered a lecture on "The Uses of Mortar and Concrete." He first spoke of hydraulic lime mortar, and then of the mixing and the use of mortars, remarking that the Romans had a good municipal rule bearing upon the subject. They made it compulsory on every builder that no lime should be used in any building unless it had been slaked at least three years. In conclusion, he dealt at some length with concrete and stone-breaking. The lecture was illustrated by drawings and diagrams.

ARCHITECTURAL ASSOCIATION OF IRELAND.—On Tuesday, the 7th inst., a meeting of this Association was held in the rooms at Lincoln-place, Mr. A. Scott in the chair, when Mr. P. J. Lynch, of Limerick, read a paper on the "Early Christian Architecture of Ireland." The paper, which was illustrated by numerous lantern views, treated of the architecture of Ireland from the earliest Christian times to the period of the Norman Invasion. Much of it was devoted to establishing the claim for a style of decorative architecture in Ireland anterior to the Norman Invasion. The resemblance between the Irish round towers and the Continental church towers at Ravenna, illustrated by views of both, was noticed, and the likeness between Lombardic and Irish architecture pointed out. The essential points of difference, however, were sufficient to establish a truly national style of architecture. The direct influence of the Lombard or Comacine masters on early Irish architecture had yet to be proved, though a strong plea was advanced for inquiry as to whether any portions of Cormac's Chapel, Cashel, might not be tenth century, as was generally supposed, until Petrie advanced it to the twelfth century, admitting at the same time that the records might mean a restoration. If this was a restoration, how far it extended was an interesting inquiry for the student of architecture. Views of other specimens of Irish architecture from the tenth to twelfth centuries were shown, concluding with the nun's church, Clonmacnoise, which Miss Stokes described as "lifting its mute form in silent witness to the life, as well as to the death, of native art." Mr. G. P. Sheridan, Vice-President, in proposing a vote of thanks to Mr. Lynch, said it occurred to him that the members of the Association might make measured drawings of the works shown on the slides by Mr. Lynch, to be reproduced in book form later. Such a book would meet with the ready approbation of the architects and public at large. All were deeply indebted to Mr. Lynch for sustaining, if not vivifying, their interest in their own architectural work.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—A large number of members of this Institution availed themselves of the permission kindly accorded by the directors of the Mazawattee Tea Co. for visiting their extensive factories at New Cross on January 9. The works manager, Mr. Sidney Densham, the superintending engineer, Mr. J. C. Wallace, and other gentlemen showed the members over. The premises are full of features of engineering interest, and an extremely instructive afternoon was spent. Nearly five acres are occupied by the area of the factories, a prominent feature in their exterior being the chimney, 150 ft. high. Electric driving and lighting is employed, steam engines, &c., supplying the power, totalling about 1,000 horse. Water is obtained from an artesian well, 460 ft. deep, worked by compressed air, the delivery being 4,000 gallons per hour. The electric generating and distributing plant, tea leadfoil rolling plant, sprinkler installation, condensing plant, automatic tea packing and weighing machinery, tin-box making machinery, printing machinery, cocoa and chocolate machinery, &c., were all seen, the many ingenious devices in connexion therewith

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receiving appreciative recognition.—The next meeting takes place at the Westminster Palace Hotel on Friday, February 7, when a paper is to be read by Mr. W. J. Cooper on "The Electric Passenger Elevator."

Illustrations.

NEW GREYFRIARS CHURCH, ABERDEEN.

THIS church is being erected by the Town Council of Aberdeen, as heritors of the Parish of Greyfriars, to take the place of the old building, which is to be demolished to make room for a large scheme of University building extension now about to be commenced. The church is to be built of finely-dressed light grey granite, including the steeple. The belfry stage is open, without glass, so that the granite groining which supports the spire will be seen, and also the bells, from the street below.

The oak carving taken from the old church is to be used again in the interior, and the fine east window of the old building is to be re-erected in the east end of the new church.

The drawing was exhibited in last year's Royal Academy. The architect is Mr. A. Marshall Mackenzie, R.S.A., of Aberdeen.

WALTON-ON-THAMES MUNICIPAL BUILDINGS.

THE design illustrated, for new municipal buildings for Walton-on-Thames, was placed first by the assessor, and selected by the Council.

The main ideas of the architects, Messrs. Macintosh & Newman, were:—The grouping together of the municipal offices and fire station with a view to a good architectural effect, and also economy in building; full provision for and consideration of the future extensions, so that when carried out they will work in harmoniously with the present scheme; and simplicity, both in plan and elevation.

We may further refer the reader to the full description of the design given in the review of the competition in our issue of November 23, 1901.

PALAZZO BEVILACQUA, VERONA.

THE Palazzo Bevilacqua stands on the south side of the Corso Cavour, Verona. It was designed by Sanmincheli about 1530 for the Verona branch of the Bevilacqua family, other branches of which possessed, or still possess in Bologna and Ferrara, palaces distinguished like this one at Verona by their crest, a wing.

On the ground floor, the front part, between the court and the street, which alone is due to Sanmincheli, is all open to the court except for one room at the side furthest from the door, while the upper floor, which is reached by an outside stair in the court, is divided into two large rooms, both originally built as a museum; hence the large windows and the unusual setting out of the whole front.

In the seventeenth century the family sold the collection, and to make the front rooms more habitable blocked up the whole of the small, and a large part of the large, windows, and put in a floor at about the level of the springing of the large windows.

Since then the palace has been very badly treated, the ground floor having been used for many years as a store for coal and coke, while the upper part has been allowed to go to ruin, many of the floors having actually fallen in. In 1901, however, it was said that it had been bought by the town to use again as a museum.

The front is built of a rather coarse limestone of a yellowish colour, which has stood the exposure to the weather very well.

W. CRUM WATSON.

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.—On Friday evening, the 10th inst., in the Chemistry Lecture-room of the Technical College, Mr. A. B. McDonald, City Engineer, addressed the members and friends of this Society, Professor Gourlay occupying the chair. The subject, entitled "The Highlands of Central Europe," was treated as a pictorial description of a tour down the Rhine Valley, through Switzerland and the Tyrol; and by means of lantern slides numerous beautiful views were exhibited of towns and villages, snow summits and gorges, passes and defiles, &c. Various examples of architectural interest were also shown.

COMPETITIONS.

SCHOOLS, TYWARDREATH.—The first premiated design in the competition for new schools, Tywardreath, Cornwall, was that sent in by Mr. W. J. Sambles, Tywardreath.

NORTHAMPTON AND COUNTY MODERN AND TECHNICAL SCHOOL.—We understand that the Governors of the Northampton and County Modern and Technical School have accepted plans for the extension of the school by the addition of chemical laboratories, lecture-rooms, boot and shoe shop, &c., and also for the erection of a master's house and boarding-house on Billing-road, Northampton. It will be remembered that the Governors asked architects to draw out plans embodying these schemes. The cost of the Billing-road buildings was not to exceed 4,000*l.*, and a similar amount was fixed for the extension and alteration of the present school. Mr. J. A. Gotch, of Kettering, was the assessor, and acting upon his recommendations the Governors, we understand, have accepted the plans prepared by Mr. Herbert Norman, of Market-square, Northampton, working in conjunction with Mr. McKewan, of Birmingham. We are informed further that a premium of 25 guineas has also been awarded to Mr. E. Danford, of Northampton, whose plans were regarded as the next best.—*Northampton Reporter.*

HARROGATE TOWN HALL.—At the monthly meeting of the Harrogate Town Council on the 13th inst., the question of the new Town Hall was discussed, and it was resolved that the Town Clerk and Borough Surveyor prepare the conditions and advertisement for competitive designs on the accommodation and area as recommended by the Committee, and that architects be informed that the sum to be expended on the building would not exceed 40,000*l.* Premiums of 150*l.*, 100*l.*, and 75*l.* would be offered for competitive designs.

Books.

A History of Architecture on the Comparative Method. By PROFESSOR BANISTER FLETCHER and BANISTER F. FLETCHER. Fourth Edition, Revised and Enlarged. London: B. T. Batsford. 1901.

SOME few years back the first edition of "A History of Architecture on the Comparative Method" was reviewed in these columns, and certain shortcomings, both in point of accuracy in details and in comprehensiveness of treatment, were duly noted. It is with all the greater satisfaction, therefore, that of the present edition we are able to say that it fulfils all legitimate expectations, and forms a complete, trustworthy, and extremely attractive manual of architectural history. Some corrections and minor improvements were made in the previous re-issues; but the new edition, for which the junior author is alone responsible (Professor B. Fletcher having died in 1899), is in many respects quite a new work.

Compared with the 1896 edition, the one before us is a much larger volume, and contains many more illustrations. Most of the original text has, Mr. B. F. Fletcher says in his new preface, been entirely re-written; but, beyond this, very important additions have been made throughout the book. Gothic architecture, for instance, both English and foreign, now receives much more attention; while the scope of the work is also widely, and most wisely, enlarged by including the architectural history of India, China, Japan, and the many lands once dominated by the Saracens. However much we may prefer the styles of Europe, no general study of architecture can properly ignore those of the rest of the world, and the more important of these are very well described here, especially considering the necessary briefness of their treatment. It is open to question whether the "non-historical styles," the title under which Saracenic, Indian, and several other varieties of architecture are set apart entirely by themselves, is a happy or even a logically good designation. But the author himself confesses to doubts as to their due places in a history, and may possibly on another occasion weld them in a little closer with what he calls the "historical" styles. For several disadvantages might be urged against this system of division, and it must strike many readers as a little quaint that the chapter on "prehistoric" architecture should have to be sought for in the specifically "historic" section.

Among the new features deserving mention are notices of Scottish, Irish, and American architecture; historical maps; an improved glossary; and many additional plates of plans, sections, and other geometrical illustrations of typical buildings of every style. These latter show much labour and skill in their selection and arrangement, and will add immensely to the usefulness of the book, both as a guide to beginners and as a work of reference for advanced students. The interesting series of birdseye views of all the English and the principal foreign cathedrals, photographed from models, should also be noticed in this connexion. The reproduction of the illustrations is in general admirable, even the most complicated drawings coming out clearly and effectively, while the photographic views of buildings leave hardly anything to be desired. A word of caution must be added—the printer should be better looked after in the poetical quotations. One well-known verse is made to appear thus:—

"See what a love shell,
Small and pure as a pearl.
* * * *
Frail, but a work divine,
Made so fairly well,
With delicate spire and wall, [!!]
How exquisitely minute,
A miracle of design."

This is hardly fair to the reputation of the author of "Maud," who has a right to be quoted correctly, if at all.

Taking the work as a whole, and accepting sundry minor blemishes as inseparable from so large an undertaking, Mr. Fletcher may well be congratulated on having produced such a serviceable text-book of universal architectural history, almost a condensed encyclopædia of the subject. It should be added that the illustrations of buildings are well authenticated by references to the authors from whom they have been copied or adapted—a point of the highest importance—and that the full lists of works to be consulted on special subjects should prove of great value to students; there is also a good index. We believe that the book has already met with considerable success; in its new form it ought to be secure of a prosperous future.

Manchester: The Cathedral and See. London: Geo. Bell & Sons. 1901.

THE see of Manchester dates but from 1847, and the church which is now the Cathedral is a building of the fifteenth and sixteenth centuries. In 1422 the church then standing, hitherto parochial, was made collegiate, and the buildings now known as Chetham's Hospital, on the north side, were originally the domestic buildings of the college. A chapter is devoted to their description and history. The church, although of late date, covers a considerable extent of ground, has double aisles to the nave (the outer aisles having originally been chapels), a large chapel of St. John Baptist north of the presbytery, with a smaller one or Ely chapel, these being balanced on the south by the Jesus and Fraser Chapels, and the octagonal chapter-house. Porches have been added in more recent times, the western entrance having lately been built from the designs of Mr. Basil Champneys. The chief point of interest in the interior is undoubtedly the woodwork of the stalls and screenwork in various parts of the building; the delicacy and elaborate effect of the former are well shown in a photograph give on p. 44. The building known as Chetham's Hospital has, like the church, gone through more than one change. Originally a mediæval mansion, it became a college in 1422 attached to the church, and in 1658 it was converted into a school founded by Humphrey Chetham. It has a picturesque interior, the chief buildings surrounding a cloister court. The book is throughout excellently illustrated from photographs. Ground plans of the church and hospital are also given.

Mediæval London. By Rev. CANON BENHAM, F.S.A., and CHARLES WELCH, F.S.A. London: Seeley & Co., Ltd. 1901.

THE book with this attractive title is the latest addition to the series of "Monographs on Artistic Subjects" published from time to time by Messrs. Seeley. The names of the authors

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are in themselves a guarantee that the work is well done, and in the comparatively small space of less than eighty pages a great mass of interesting facts and material has been brought together dealing with the buildings and people, and their manners and customs, privileges and pageants, and the innumerable points of interest in the life of London from the time of the Conqueror to the days of the Stuarts, the beginning of which latter period has been taken as the starting-point of the gradual transition from the mediæval to the modern city. The book is divided into six chapters, the first being a general survey of the city during period covered by the "Monograph," with lists of the principal buildings, ecclesiastical and civil. The succeeding four chapters deal in turn with the civic life of the city, the Guildhall, and the historic scenes and pageants of which it has been the centre; the Thames, and the old bridge, with its chapel and houses; the religious life of London, which in its turn was centred in the great cathedral, and around which were the numerous fine ecclesiastical buildings of the City churches and monastic foundations; and lastly a chapter devoted to the fortress, palaces, and mansions, the Tower, the great houses at Westminster and Greenwich, Baynard's Castle, the Savoy, and the Bridewell, and the houses of the nobility that in this and later times stretched along the banks of the Thames westward of the Temple. A final chapter describes the transition period, which may be said to have begun with the Stuart dynasty, and which was further marked by the Great Fire of 1666, the catastrophe that, perhaps, above all others, caused the changes out of which has grown the great Metropolis of to-day.

The book is excellently illustrated with reproductions in colours from MSS., the panoramic view of London by Antonie van den Wyngaerde, and views of the Palace of Greenwich, and a series of reproductions from drawings by J. Wykeham Archer, made in 1841 and the following year, of many bits of mediæval London, some now unfortunately destroyed. Every page of this work bears evidence of the care and ability of the authors, and it will be of value to all who take an interest in the history of the gradual rise of London and the changes through which it passed.

The Chemistry of Paints and Painting. By A. H. CHURCH, F.R.S., M.A., D.Sc. Third Edition. London: Seeley & Co. 1901.

THE first edition of this work appeared in the year 1890, and the fact that the book has already reached a third edition is sufficient evidence that it has been found of value. It may be well to mention that the book refers mainly to the materials used by artists, and not to house painting, although it is not devoid of information which even a house painter might assimilate with advantage.

The subject of the book has not hitherto received that general attention which is merited by its importance, but its treatment could not have been entrusted to an abler hand than that of Professor Church, who is at once an eminent chemist in touch with the most notable artists of the day, and an indefatigable investigator into the causes of the deplorable changes which have been wrought by time in the priceless works of hands long since still.

With regard to the utility of a knowledge of chemistry to artists, the following passage which occurs in the preface is of interest:—

"'Titian managed pretty well without chemistry, did he not'? A distinguished artist asked me this question the other day. But not only were the conditions under which the painters of Titian's time worked simpler than those of the nineteenth century, but grounds, paints, oils, and varnishes were generally prepared in the studios of the artists, and under their own superintendence, so that the chances of going wrong were comparatively limited. And it is not to be denied that a better acquaintance with the nature of the materials which many of the old masters employed would have caused their works to be handed down in sounder preservation to future generations."

In the introduction Professor Church points out that

"Nowadays it is very seldom that a painter prepares for himself any one of the materials which he uses, generally accepting, without much hesitation and without examination, the paper, the canvas, the paints, the oils, and the varnishes which his colourman supplies, provided they respond at first sight to his requirements. . . . . He may go so far as to reject chromate of lead, but he still employs the pigment called chrome green, or green cinnabar, for he does not know that the same chromate of lead enters largely into its composition; and he still thinks that madder yellow is a sound paint, because it is called madder, while he rejects the yellow lakes, which are derived from the same source."

The book is divided into four parts. Part I. deals with the various painting grounds such as paper, vellum, ivory, plaster, panels, stone, and canvas. Part II. discusses the vehicles and varnishes. Part III. is devoted to pigments, and Part IV. to painting methods, the study and conservation of old paintings and water-colour drawings, and a discussion of the trials made by various authorities regarding the durability of pigments.

We strongly recommend the book to those interested in the making of pictures intended to be permanent, and to those concerned in the construction of picture galleries.

Bricklaying and Brickcutting. By H. W. RICHARDS. London: Longmans, Green, & Co. 1901.

THIS is a new work, written by the head of the Building Trades Department of the Northern (London) Polytechnic Institute, and is on the whole creditable both to author and publisher. The page is of a good and convenient size, and the type also; the illustrations are clear and plentiful. The author has a good knowledge of his subject, and spares no pains to make his meaning clear to beginners.

The work consists of three main parts, dealing respectively with brickwork in general; arches, gauged work, and special details; and the materials employed in making and setting bricks. There are also appendices, including a description of the London practice in measuring brickwork, a short model specification, a glossary, and, of course, the inevitable examination papers.

We suppose it is the influence of these examination papers which leads to the waste of so much space in what is pre-eminently intended for a practical work, besides what is much worse, to such an appalling waste of students' time, over the really useless subject of "single Flemish bond" and "double Flemish bond." All this only mystifies the beginner, and as every bit of brickwork that can conceivably be needed in any kind of building can be better done—in every sense of the word—in English bond, why should examiners insist on keeping up this system of Chinese puzzles? The space and the time would be far better occupied in the consideration of some much-needed improvements in English bond, which, though the best form of brickwork at present used in this country, is by no means perfect yet.

We shall never get the perfection of brickwork, perfectly sound throughout and perfectly satisfactory to the eye, till we get rid of those weakening and weak-looking scraps called "closers" and substitute three-quarter bats in all our piers and quoins. Closers look neat and pretty enough, as drawn on plan in tidy diagrams, but do these professors of theoretical brickwork ever look at the inside of a broken-down pier or wall and see the rubbish of three-cornered chips which runs right through the work just where it ought to be strongest? Experiments in crushing piers have demonstrated (as any one could have easily foretold) that the line of closers is the first line of fracture in a pier; but our teachers of brickwork still ignore it. But what also wants driving home to them is this: There is a sound maxim that what is mechanically right, looks right, and this is most markedly the case if the artistic effect of work built with and without closers be compared, particularly in such instances as the face of a narrow buttress or pier, where on the closer system each alternate course looks made up of fragments. The reason of the more satisfying appearance of English bond with three-quarter bats (or, as it is sometimes called, "Dutch" bond) is probably this, that (except occasionally in a re-entering angle, where it is little noticed) every brick seen *is wider than its own height, i.e.*, nothing is less than 4½ in. by 3 in. This gives a comfortable expression of stability to the whole work, the effect of which is quite destroyed by the sticking in (they never look really "laid") all along the angles of a number of upright slips with a width of about 2 in.

We cannot agree with Mr. Richards in his slighting description of plinths. "The plinth," he says, "is an architectural feature only in the building, and is frequently a source of weakness. The slight projection, often only 2¼ in. or under, does not conduce to good bonding, and leads to bad workmanship." He then gives "a section showing the best treatment of a plinth projecting 2¼ in." This section is certainly not satisfactory, as it shows a 14-in. wall thickened out by closers right down to the footings. The bricklayer may occasionally have to work to such a design, but in an ideal example the wall should have been arranged with a 2¼-in. offset on the inside corresponding with the plinth, thus forming an 18-in. wall thence downwards. This is of course supposing that circumstances limited the outside projection to 2¼ in. only, though we should say that in almost every case a building of any architectural pretensions should be given a plinth of 4½ in. projection at least. Such a plinth is not an extravagant luxury, but rather a necessity, and makes an incalculable difference in the expression of a building. A timid plinth at once suggests a feeble designer. There may be instances, as when the whole wall is strongly battered, where plinths may be dispensed with; but for the large majority of buildings the plinth is an essential feature of the first importance.

The following sentence calls for an emphatic protest:—"There are several other fancy-coloured mortars, such as pink, chocolate, &c., the object being to make a contrast between the brick and the joint. Thus a deep chocolate *blends well* with red facings, &c. (the italics are ours); but being too numerous to deal with individually, the colouring must be left to the judgment of the practical man." What an appalling prospect in store for people with eyes! Cannot builders of all grades realise that such tampering with the joints is absolutely destructive of the artistic value of a plain building, and exceedingly detrimental to that of an elaborate one? For, try what they will, every departure from the natural colour of good lime-and-sand mortar (and the tints it gains by weathering) only makes for vulgarity and ugliness.

Several sections might very well be made fuller, and Mr. Richards refers to treating certain subjects "in some future work." We hope, however, that it may not be long before he will be able to bring out a revised edition of the present one, since, with a moderate amount of correction and enlargement, it might bid fair to be reckoned a standard treatise. The subjects of brick-vaulting, which is not touched on, of chimney-stacks and caps, which is only very slightly dealt with (though we are glad to endorse the sensible recommendation, "it is far preferable to have 9-in. outside work to chimney-stacks to keep out both the rain and the cold, which retard the even flow of the smoke"; this really ought to be the rule, instead of, as at present, the exception), and of buttresses (which word does not even occur in the index), may all be commended to Mr. Richards' notice when preparing his new edition.

Bricklaying. By OWEN B. MAGINNIS. New York: Published by the Author.

THE title-page of this work reminds one of a seventeenth-century one in its prolixity, but a transcription of part of it will give the best possible idea of the nature of the work itself:—"'Bricklaying.' By Owen B. Maginnis. This book contains extensive detailed explanations of the most approved modern methods of 'bricklaying,' as applied at the beginning of the twentieth century. The information has been obtained directly from the work during construction, and is the current practice and experience of the best authorities, supplemented by chapters on 'Shoring,' 'Needling,' and 'Underpinning.' The whole making an invaluable book of reference for architects engineers, contractors, builders, and mechanics Illustrated by over 200 engravings with full descriptive text," &c.

These large promises have been fairly fulfilled, and the author has succeeded, with the aid of double columns and small print, in compressing a surprising amount of really practical instruction into a volume of quite moderate compass. The illustrations are rough and unpretentious, but always clear and to the point. A good deal in the book would appear strange to the English student, when one reads, for instance, that "the usual average size of a common brick is 8 in. long, 3½ in. wide, and 2 in. to 2¼ in. thick;" that "a good brick dry weighs from 3¼ lbs. to 3¾ lbs.;" or that all "lammies" should be rejected.

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takes a little time to get used to the descriptions of 12-in., 16-in., 20-in., and 24-in. walls; and "clips," "Chicago bond," and "Rosendale cement" have all an unfamiliar sound; but for all that there is much information in the book which is sound and profitable as well as novel. Most of our English instructors of brickwork might study this book with advantage, if they would only carry away from it and apply the lesson that we English are not infallible, even in such an apparently simple matter as the best methods of using bricks.

The Practical Engineer Pocket-Book for 1902. Technical Publishing Co., Ltd., Manchester.

THIS useful notebook, which has now reached its fourteenth edition, includes a good number of additional tables, and special attention has been devoted to the section dealing with gas-engines. Amongst other new features now introduced, we may mention the sections relative to Mond gas, mechanical refrigeration, and the photo-copying of drawings. A subject that is very briefly and incompletely treated is that of lifts. Lifting machinery certainly finds a place in the index, but nothing is found about lifts when the page is turned up. Hydraulic lifts are also indexed, but next to no information is given concerning them, while electric lifts are not even mentioned. In commending these points to the consideration of the publishers, we make the further suggestion that the index ought to be placed where it can readily be found. This constantly-required detail is now hidden away right in the middle of the fifty-one pages of advertisements with which the book commences—a most annoying arrangement to regular users of an otherwise excellent publication.

"*The Practical Engineer*" *Electrical Pocket-Book for 1902.* Manchester: The Technical Publishing Co., Ltd.

THE third annual edition of this cheap and useful pocket-book contains several important additions which materially add to its value. The increasing importance of dust destructors in connexion with electrical power generation has led to the introduction of a new section devoted to this branch of engineering. We are sorry that a frustum of a cone is called a "frustrum," as this will help to perpetuate a very common mistake.

BOOKS RECEIVED.

ARCHITECTURAL ENGINEERING. By T. Kendall Freitag, C.E. Second Edition, rewritten. (Chapman & Hall.)

LOCKWOOD'S BUILDERS' AND CONTRACTORS' PRICE BOOK, 1902. Edited by F. T. W. Miller, A.R.I.B.A. (Crosby Lockwood & Son).

PETER VISCHER ("Great Craftsmen" series). By Cecil Headlam. (Geo. Bell & Sons. 5s.)

ELECTRICAL STANDARDISING TRAINING INSTITUTION.—As the result of the recent scholarship examination, the Board of Control of the above Institution have made the following awards:—To Alfred Thomas Morris, of Bedford Modern School, a Maxwell scholarship, value fifty guineas, tenable for two years; to William Leighton Chubb, of Dunheved College, Launceston, an exhibition, value thirty guineas, tenable for two years; to Alban Cecil Whish, of Hillmartin College, an exhibition, value twenty guineas, tenable for two years; to Herbert William Swann, a special prize of fifteen guineas; to Eustace Blackburne Ritson, of Shrewsbury Public School, a special prize of ten guineas.

RAILWAY TUNNELS AND THE LONDON PARKS AND GARDENS.—Some of the measures for the construction of tube-railways in London that have been prepared for the current Session of Parliament embody projects for making tunnels beneath three of the parks and the Victoria Embankment-gardens. The proposed line of the Charing Cross, Hammersmith, and District Electric Railway is planned to pass beneath the southern steps of the Albert Memorial in Kensington Gardens, and beneath Hyde and Green Parks. Two schemes framed by the London United Electric Railway Co. contemplate an interference with Victoria Embankment-gardens; St. James's Park, near Buckingham Palace; Green Park, along the entire side of Constitution Hill; and Hyde Park, along the south side and across the middle of the eastern portion. The tunnels would be made at depths varying from 70 ft. to 80 ft., and in one instance of 100 ft., respectively, beneath the surface, and their projected construction is viewed with considerable alarm by those who are anxious for the security of open spaces in London, and the preservation of their natural beauties.

Correspondence.

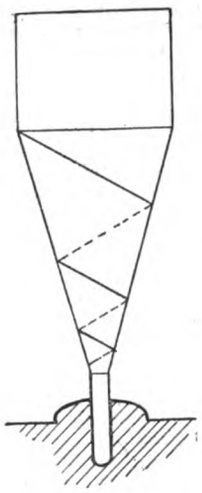
THE IONIC VOLUTE AND THE NIKÈ APTEROS CAPITAL.

SIR,—Referring to your report of Dr. Murray's paper, may I say that twenty years ago I arrived at the conclusion that the British Museum capital probably belonged to the Temple of Nikè Apteros.

What led me to this conclusion was the presence of a small hole in the centre of the eye of the volute, which can be seen both in photographs of the temple and also in the drawing of the capital in Inwood's Erechtheion (plate 23).

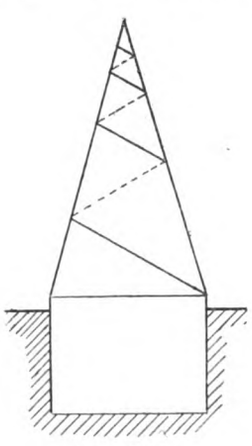
Let me explain why I attach so much importance to this small hole.

I had been commissioned to make a small copy of the Nikè Apteros Temple. I made the drawing



NIKÈ APTEROS.

for the capital by Goldman's method, but I knew that no Greek would ever have allowed so crippled a curve in his work, and I therefore sought a better way. It struck me that I might use a cone for the purpose by winding a string round it, fastening a pencil to the loose end of the string, and then unwinding it; and having made my instrument, I got a very good spiral from it. I fixed my cone point downwards by a stout pin into the drawing-board, so stout that I could not draw the inner revolution. It then occurred to me to fix it point upwards, by which means I could use the cone up to the point, and this plan answered perfectly. I then saw that the large holes in the



MINERVA PRIENE.

centre of the old Greek volutes would just hold my cone, and, having made one to fit the Priene example, I obtained an interview with the late Sir Charles (then Professor) Newton, placed the cone in the hole of the volute, the pencil in his hand, and asked him to unwind the string, which he did, describing, much to his astonishment and interest, the line of the spiral.

I afterwards came to the conclusion that I could as well use the cone point downwards by having a small pin on the end and a small hole to receive it, steadying the cone at the top. Imagine my delight at finding the identical small hole in Inwood's drawing and in the photographs of the Temple of Nikè Apteros, and I made my capital from his drawing and by using, I believe, an instrument identical with that used by the ancient Greeks to make its progenitor.

Now may I generalise from my experiences—discoveries if you will.

We find four different centres in these old volutes.

1. The shallow hole in the fragment from Mycenæ and in the Parthenon antefix.

2. The deep hole in the Minerva Priene, the Mausoleum, and many others.

3. The small hole in Nikè Apteros. I know of no other example.

4. No hole in the Erechtheion.

There are also archaic examples without holes or a centre eye.

The reasonable conclusion seems to me that they point to four different methods being used in the production of the volute. If the ancient examples were classified under these heads I believe it would help to determine their date.

But a far more interesting and important question is the evidence of the use of Greek drawing instruments. I do not hesitate to affirm that every form of Greek vases and ornaments (except, of course, the frets and volutes) took its rise in the curves produced by a revolving plane. We have evidence of the use of these same instruments by the Egyptians and Assyrians, but to enter on this question would make my letter too long.

I would only urge that attention should be given to the practical side, both of masonry and pottery, in determining origin and dates, and fortunately the ancients have left plenty of evidence for us on their works.

DANIEL WOOD.

THE DIRECT EMPLOYMENT OF LABOUR.

SIR,—Your readers may consider that Mr. Blashill's last letter does not lead one to suppose that his "arguments" on the above subject are in any way convincing, nor do I gather that his endeavours to make his views clear have met with much success.

I may say that what first called my attention to this subject was, when casually glancing through your columns, I noticed his statement that "the contractor may, if he likes, have his yard and workshops, his dead stock and live stock, his machinery and the clerical staff of a large manufacturing establishment. *But it is no more necessary than* it is for a joiner to have the old-fashioned box of tools;" and this led me to further peruse his letter as a whole. On this one point in particular Mr. Blashill has carefully avoided any further reference in his subsequent letters, and one must assume he can produce no arguments to satisfactorily explain such statement. If, however, he still adheres to it, one can only conclude that he has had very little experience of "what is necessary to enable a contractor to carry on his business successfully."

The "labour question," too (in connexion with the subject now under discussion), is quite a different matter to the "labour question" as Mr. Blashill would have us understand. Under the heading of this correspondence it resolves itself into a question, not of "wages and conditions of labour," but—"Would the workmen do as much work—or, in other words, work so cheaply—for a direct employer (private owner, &c.) as they would under the superintendence of an experienced builder?" assuming that equal conditions prevail. I maintain decidedly not.

Mr. Blashill has, unfortunately, departed from the main issues as applying to this correspondence, and it is useless, therefore, continuing the discussion on such lines, as confusion would result.

I may say, in conclusion, one of my "experiences" of direct employment was being called in (as a surveyor) to endeavour to elucidate the mystery of "Where has the money gone?" in a case where a firm of large manufacturers had been induced, by the advice of their architect, to build for themselves. That gentleman regretted he had given such advice ever after; he lost his clients in this case, and many others, as a consequence.

GEORGE H. CHAPPELL.

LIVERPOOL CATHEDRAL.

SIR,—As Mr. Shallcross considers that my letter "excellently supports the Petition Committee's opposition to the selected site," I should have thought he might have let the matter rest as far as I am concerned, and not have troubled you and me with his eleven rather laboured questions. Happily, they are pretty easily answered, and my replies will not take up very much of your space. I must deal with them numerically:—

1. I know nothing of Archdeacon Madden's speech. It would be a pity not to reserve the power of placing some further buildings on the vacant part of the site. Room for such buildings could no doubt be also got near the Monument site, at a price!

2. The cathedral, if built on the Monument site, would, I believe, be much nearer to the lines of traffic than St. George's Hall is.

3. It was the fact of the Monument site being "surrounded by electric tram lines" that I referred to.

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4. This question seems to answer itself.

5. I have already expressed my opinion on this point, and need not repeat it. The later clauses of this question really do not need replying to.

6. In this question Mr. Shallcross shows that he has not given much study to the St. James's Mount site. The cemetery does not drop "40 or 50 ft." immediately beyond the boundary of the site.

There is first a belt of cemetery ground some 30ft. wide nearly level with the site; beyond this there is a terrace wall with a drop of about 6 ft., and then a path, perhaps 15 ft. wide—the rapid fall into the cemetery proper only beginning beyond this path. These are the "upper terraces" I referred to. The Cathedral Committee should certainly obtain power to build over them, the path being arched over if need be.

7. I merely suggested the question whether Liverpool was not big enough to possess more than one centre of architectural interest. I do not presume to decide the point. I really cannot discuss the position of the British Museum.

8. A district of solid shop property is hardly likely to change its character materially.

9. Wild horses should not tear from me the name of the person in question! I said in my letter that the day was a cold one, and that the average attendance was probably greater.

10 and 11. This is a serious matter. I had not heard the results of the test holes, but I saw the soil which had been dug up, which was evidently quarry waste. Opposite the chaplain's house, however, the native rock may be seen, which looks as if it would be reached at no very great depth. It is entirely a matter of money. In a large church I am now engaged on all the principal piers, &c., have had to be carried down from 20 ft. to 30 ft. to reach solid soil. If the depth shown by the test holes applies to the site generally, the additional cost will certainly be severe.

I hope Mr. Shallcross will not think I have treated his questions inadequately, but in any case I sincerely trust he will not ask me any more.

J. OLDRID SCOTT.

PORTABLE WOODEN DWELLING-HOUSES.

SIR,—I shall be obliged if you can give me the address of any firm in Great Britain who make portable wooden dwelling-houses.

A client of mine requires one of four rooms to be sent to Rio Janeiro (S. America) by boat, in pieces ready fitted together. FRED. E. DOTCHIN.

The Student's Column.

DRAINAGE AND PRIVATE SEWAGE-DISPOSAL.

CHAPTER 3.—THE LAW IN ENGLAND AND WALES, EXCEPT LONDON *(continued)*.

MANY Local Authorities are now committed to the separate system of sewerage—that is to say, two sewers are provided, one for rainwater and, perhaps, subsoil-water, and the other for sewage, including also some portion of the rainfall. This involves, of course, separate drains, and the question arises whether a Local Authority can compel a building owner to provide these two sets of conduits. According to Matthews *v.* Strachan, which was a case stated by justices for the opinion of the High Court, the Local Authority has no such power. The case was heard before Mr. Justice Ridley and Mr. Justice Bigham in the King's Bench Division on June 20, 1901. The appellant Matthews had deposited with the Harrow Urban District Council the plans of a house which he proposed to erect in Lyon-road, Harrow. On these plans one set only of drains was shown.

The Council's Surveyor reported that one 4-in. sewage drain must be laid and connected to the Council's sewage sewer, and that one 4-in. surface-water drain must be laid and connected to the Council's surface-water sewer. The Council passed a resolution approving the appellant's plans, subject to the requirements contained in the Surveyor's report as to the drainage being carried out. The appellant, however, laid only one drain in accordance with the deposited plans. The magistrates gave a verdict in favour of the Council, but the High Court decided that the justices were wrong. It was held that "Section 25 of the Act empowered the Local Authority to take into consideration certain matters, and only certain matters, for the purpose of satisfying themselves whether the drain proposed was effectual for draining the house—viz., the size, material, level, and fall. If matters beyond the requirements of the section were asked for, it was in effect asking the owner of the house to subscribe to a general system of drainage. That was not the intention of the Act. The decision of the justices must be reversed."*

The *Law Journal*, commenting on this case, says that it is doubtful whether a Local Authority can validly make any by-laws to get over the effect of this decision. If this view is correct (and we see no occasion for doubting it), a serious blow has been struck at the separate system of sewarage. A new Act of Parliament will be required, or the Local Authority must pay for the extra drain.

This decision would also seem to call in question the Local Authority's power to compel a person laying out a new street to provide two sewers, one for sewage and the other for surface-water. Many Local Authorities decline to approve the plans and sections of new building estates unless the two sets of conduits are shown; they may be within their rights, but we all know that public bodies have a bad habit of going beyond the law, as very few persons are able or willing to oppose their arbitrary acts.

As an example of this habit of Local Authorities or their officials, we may mention the case of a town the surveyor of which recommended that the owner of every drain should be compelled to lay a ventilation drain, from that portion of his sewage drain which intervenes between the intercepting trap and the sewer, to his building, and to carry a ventilation shaft up the wall of the building from the ventilation drain; in other words, that private individuals should be compelled to provide the means of ventilating the public sewers, although by Section 19 of the Act the duty of ventilating such sewers is explicitly laid on the Local Authority.

We pass now to Section 41, which throws upon the owner or occupier of premises the responsibility of maintaining the drains, cesspools, &c., on or belonging to such premises in such a condition as not to be "a nuisance or injurious to health," and empowers the Local Authority's "surveyor or inspector of nuisances, after twenty-four hours' written notice to the occupier of such premises, or in case of emergency without notice, to enter such premises, with or without assistants, and cause the ground to be opened, and examine such drain . . . . or cesspool." If the drain or cesspool is found to be in good condition, the damages must be made good by the Authority, but "if the drain . . . . or cesspool on examination appear to be in bad condition or to require alteration or amendment," the Local Authority may give notice in writing to the owner or occupier, requiring him to do the necessary works within a certain time, the penalty for default being 10s. a day; in case of non-compliance, the Authority may do the work and recover the expenses from the owner (not occupier), or declare them to be private improvement expenses. Note that if the drain or cesspool is either a nuisance or injurious to health, the section can be put in operation. By Section 306 the owner of any premises on being prevented by the occupier from "obeying or carrying into effect any provisions of this Act" can obtain from any justice a written order requiring the occupier to give the necessary permission within twenty-four hours, the penalty for non-compliance not to exceed five pounds per day.

5. *Sewage Disposal.*—We have seen that the owner or occupier of a "house" has the right of connecting the drains from that "house" to the public sewers of his own or neighbouring Local Authority, and that he can be compelled to make such a connexion provided that there is a public sewer not more than 100 ft. from the site of such house. If there is no public sewer within this distance, the drain must (according to Sections 23 and 25) empty "into such covered cesspool or other place, not being under any house, as the Local Authority direct."

It need scarcely be said that the method of disposal must be neither a nuisance nor injurious to health (Section 41, already quoted), and that it is unlawful to turn sewage into rivers, although Local Authorities, being great sinners themselves in this respect, often wink at such pollution. The Local Authority may decide whether a covered cesspool or some "other place" shall be used for the reception of the sewage.

Urban and Rural Authorities, after adopting Part III. of the Public Health Act Amendment Act, 1890, may (under Section 23) make by-laws with regard to cesspools, &c., "so as to affect buildings erected before the times mentioned" in Section 157 of the Act of 1875. By-laws made to this effect were contested in the case of Simmons *v.* Malling Rural District Council (1897, 2 Q.B., 433). Simmons was the owner of an old public-house, which was formerly drained into two cesspools. In October, 1896, in consequence of a notice from the Inspector of Nuisances, he filled up the two cesspools, and afterwards constructed another within a distance of 17 ft. from the buildings, and connected the drains to this new cesspool. One of the by-laws of the Council specified that every new cesspool must be constructed "at the distance of 50 ft. at least from a dwelling-house." It was held that the by-law applied, although the building was an old building, and that it was not *ultra vires* or unreasonable, and was therefore valid.

By Section 24 of the Public Health Acts Amendment Act, 1890, a penalty not exceeding 2*l.*, and a daily penalty not exceeding 10s., can be enforced against any person who occupies, and any person who suffers to be occupied, any room a portion of which extends over any privy, cesspool, midden, or ashpit, whether the room was built before or after the adoption of Part III. of the Act.

6. *By-laws and Regulations.*—By-laws may be made by Local Authorities (both urban and rural) imposing the duty of cleansing cesspools "at such intervals as they think fit" on the occupier of any premises (Section 44), for enforcing the drainage of houses let in lodgings (Section 90), and for other purposes. Urban Authorities may also make by-laws with respect to the sewerage of "new streets" (Section 157), and the same power can be obtained by Rural Authorities (for the whole or part of their districts) on application to the Local Government Board.

We have also seen that regulations may be made by Local Authorities under Section 21 in respect of the mode in which the communications between drains and sewers are to be made, under Sections 23 and 25 (although the word "regulations" is not here used) in respect of the size, materials, level, and fall of drains, and under Section 40 in respect of the construction and maintenance of cesspools.

Section 23 of the Public Health Acts Amendment Act, 1890, extends the powers of making by-laws, and specifies that by-laws made with regard to the drainage of buildings and to water-closets, earth-closets, privies, ashpits and cesspools, &c., may be made so as to affect old as well as new buildings.

By-laws made by a Local Authority under the Public Health Act do not take effect until they have been confirmed by the Local Government Board. Regulations, on the other hand, are at the entire discretion of the Local Authority, provided, of course, that they do not exceed the limits imposed by Act of Parliament.

The by-laws of different districts vary in many important particulars. In some cases by-laws framed more than thirty years ago are still in operation, but modern urban by-laws invariably follow pretty closely the "Model By-laws" issued by the Local Government Board. These will be considered in Part II., together with the model by-laws which have recently been issued for rural districts.

LONDON (EXCLUSIVE OF THE "CITY").

1. *Drains and Sewers.*—In the Metropolis the principal provisions regarding drains and sewers are to be found in the Metropolis Management Act, 1855. In the main the Vestries and District Boards (now superseded by the Borough Councils or Corporations) are invested with powers regarding sewers and drains similar to those conferred on provincial Local Authorities by the Public Health Act, 1875. The word "drain" is, however, defined so as to include "any drain for draining any group or block of houses by a combined operation under the order of any Vestry or District Board." This point will be briefly considered under the head of "Combined Drainage."

By Section 69 those sewers which are vested in the Vestries or District Boards must be repaired and maintained by them, and the Vestries or District Boards are made responsible for the construction, repair, and maintenance of such sewers as may be necessary for effectually draining their parishes or districts. The next section empowers the Vestry or District Board to alter or improve

* A fuller report of this important case will be found in the *R.I.B.A. Journal* for July 27, 1901.

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sewers, &c., for the maintenance or repair of which "any party" is liable, and to divide the expense between such party and the parish or district and others. Section 72 imposes on the Vestries or District Boards the duty of causing the sewers vested in them to be constructed, covered, and kept so as not to be a nuisance or injurious to health, and to be properly cleansed and emptied.

2. *Combined Drains.*—The definition of the word "drain" given in the Metropolis Management Act, 1855, is almost word for word like that subsequently adopted in the Public Health Act, 1875, but in the Metropolitan Act the following words are added:—"And shall also include any drain for draining any group or block of houses by a combined operation under the order of any Vestry or District Board." By the Metropolis Management Amendment Act, 1862 (Section 112), the following clause was added to this definition:—"And also any drain for draining a group or block of houses by a combined operation, laid or constructed before the first day of January, 1856, pursuant to the order or direction, or with the sanction or approval, of the Metropolitan Commissioners of Sewers." Here we have a definition of what is meant by a combined drain in the Metropolis.

The powers of Vestries and District Boards with regard to combined drains are stated in Section 74:—"If it appear to the Vestry or Board of any parish or district that a group or block of contiguous houses, or of adjacent detached or semi-detached houses, may be drained and improved more economically or advantageously in combination than separately, and a sewer of sufficient size already exist or be about to be constructed within 100 ft. of any part of such group or block of houses, whether contiguous, detached, or semi-detached, it shall be lawful for such Board or Vestry to order that such group or block of houses be drained and improved, as hereinbefore provided, by a combined operation."

Under this section the Public Authority can compel the owner of a building which is more than 100 ft. from a sewer to convey the sewage from the building to this sewer, if an adjacent building which is less than 100 ft. from the sewer can be drained with it by a combined operation.

GENERAL BUILDING NEWS.

NEW VESTRY, STOKE BISHOP CHURCH.—A new vestry has been added to Stoke Bishop Church, near Bristol. The nave has also been repaved with terrazzo mosaic by the Art Pavements Co., London, and the sanctuary with encaustic tiles by Messrs. Godwin, of Hereford. The chancel steps have been re-arranged, together with other improvements. The church has also been re-heated by Messrs. Crispin, of Bristol. The work has been carried out by Messrs. Cowlin & Sons, Bristol, from the designs and under the superintendence of Mr. C. Aubrey Rowley, of Bristol, with Mr. John Norton, of London (who built the church in 1864 and added the tower and spire in 1872) as consulting architect.

CONGREGATIONAL CHURCH, HARRINGAY.—A new Congregational church was opened on the 9th inst. at Green-lanes, Harringay. The church consists of nave and aisles, with an apse at the end, and double transept. Red brick and Monk's Park stone have been used in the erection of the building, the architect of which is Mr. Church.

WESLEYAN CHAPEL, OSMASTON, DERBYSHIRE.—On the 8th inst. a new Wesleyan chapel was opened at Osmaston-by-Derby. The building consists of bricks with Derbyshire stone embellishment, and will afford accommodation for 560 persons. The total cost will be about 3,000*l.* The architect is Mr. John Wills, of Derby and London, and the builder Mr. W. Edwards, of Derby.

ADDITIONS, ST. MICHAEL'S CHURCH, NOTTINGHAM.—The addition of a choir vestry, north porch and tower, to the Church of St. Michael and All Angels, Nottingham, is now approaching completion. The new vestry is a semi-octagon or irregular form, and the porch is in Gothic style, the gable being ornamented with open-work carving. The tower will be carried, for the present, to a height of 44 ft., but the ultimate intention, when the funds permit, is to construct a tower of much greater height, with proper belfry accommodation. The outside measurement of the north frontage of the tower is 20 ft., and the walls are 4 ft. thick, supported by buttresses 4 ft. by 4 ft. 6 in. at the base, diminishing to 3 ft. 6 in. by 3 ft. The masonry is of rock-faced Bulwell stone, with Bath stone dressings. The architects are Messrs. Habershon, Fawckner, & Groves, of Cardiff and Newport; and the general contractor is Mr. J. Shaw, Nottingham, by whom sub-contracts have been entrusted to Messrs. Wilkinson & Son, Bulwell, for the Bulwell stonework, and to Mr. Clarke Lenton, for the Bath dressings.

CHURCH, COTTERIDGE, KING'S NORTON.—The Building Committee have approved of the designs of Messrs. Cossins, Peacock, & Bewlay for the erection of a church at Cotteridge. The church is estimated to cost 9,000*l.*

SCHOOLS, WESTBURY-ON-TRYM, GLOUCESTERSHIRE.—New school premises have been erected at Westbury-on-Trym. The architect for the new buildings was Mr. F. Barnes, and the builders were Messrs. Harris & Co.

SCHOOL, DUNFERMLINE.—A new school has been erected at St. Leonard's-place, Dunfermline. The building, which has been erected in accordance with plans prepared by Mr. D. Barclay, architect, Glasgow, has cost between 7,000*l.* and 8,000*l.*

SCHOOLS, SUTTON COLDFIELD.—On the 8th inst. the schools which have been in course of erection in connexion with the Congregational Church, Sutton Coldfield, were formally opened. The new schools have been erected by Messrs. W. Lee & Son, of Aston, from the plans of Mr. Harry H. Reynolds, architect, Birmingham and Sutton Coldfield, at a cost of 2,500*l.*, and will afford accommodation for 350 scholars.

ADDITIONS, NEWINGTON WORKHOUSE.—A new wing has been erected at Newington Workhouse, Westmoreland-road. The addition has been built by Mr. John Marsland, of Walworth, from the designs of Mr. G. D Stevenson, Cheapside.

ISOLATION HOSPITAL, CHAPEL MILTON, DERBYSHIRE.—There has been erected a large block of buildings at Chapel Milton, near Chapel-en-le-Fritb, for the purposes of an infectious diseases isolation hospital. Mr. W. R. Bryden is the architect.

WORKSOP AND DISTRICT ISOLATION HOSPITAL SCHEME.—A meeting of the Worksop and Blyth and Cuckney District Joint Isolation Hospital Committee was held at the Town Hall, Worksop, recently, when Mr. F. Hopkinson, the architect, presented the building plans and the estimates of the proposed isolation hospital, and after discussion upon details the plans were ultimately approved, and it was resolved to apply to the Local Government Board for permission to borrow 6,000*l.* to carry out the scheme.

BUILDING IN ABERDEEN.—What was known as the "building boom" culminated in 1898, when 747 plans of buildings were sanctioned by the Aberdeen Town Council, of the total estimated value of over 514,000*l.* This was the highest level ever reached in the long history of the city, and it was felt at the time, that in the nature of things a continuance of such a fever heat of building operations could not be looked for. . . . But while it was impossible to expect annual additions to the gross value of buildings to the extent of half a million sterling, there was every reason to believe that with the increase of population, the addition of new industries, and the development and extension of existing businesses, there would be a renewal of activity in the building trade, and the figures for the complete year from December, 1900, to November, 1901, show that the expectation was well founded. Possibly the rise in the value of material, coupled with the over-erection of dwelling-houses, was a factor in checking operations; but the figures as now made up seem to point to the fact that the tide has reached its lowest ebb and has begun slowly to return. For example, for the twelve months which closed on November 30 last, the number of plans of new buildings of all kinds sanctioned by Aberdeen Town Council and by the Burgh Surveyor was 501, as against 499 for the previous year. In number this does not seem at first sight an increase worth stating, but when the value of the buildings themselves comes to be considered the facts strike one as satisfactory for the present. The total estimated value of the buildings sanctioned during the year amounted to no less than 328,760*l.*, as against 209,544*l.* the preceding years which gives an increase of 29,216*l.* It is no matter of regret that there were fewer dwelling-house, sanctioned than the previous year, because the number of these was too large; and it is rather satisfactory than otherwise, that there is a very substantial addition to the figures applicable to public buildings. Taking all things into account, the past year, while exhibiting no startling developments, has been marked by quiet, steady work of a healthy character, indicating a fairly prosperous condition of affairs. Perhaps the word "normal" would fairly enough express the character of the year with regard to building.—*Aberdeen Journal.*

BUILDING IN GRIMSBY.—Taken on the whole, the building trade in 1901, though not particularly brisk, has been quite satisfactory. While there has been an absence of new and imposing structures, house property has continued to be erected in quantity and with rapidity. Naturally the high prices of materials have had, to some extent, a detrimental effect on building operations, yet a fair amount of work has been carried out. Of labour there was an adequate sufficiency, and no differences have arisen to mar the relations of men and masters. The earlier part of the year was busier than the closing part, and so far as house property is concerned, it will be remembered that prior to the lock-out there was scarcely a house to be had. Builders could not get them up quick enough, and property owners took advantage of the opportunity thus afforded of raising the rents. The past few months have witnessed a change, and there is more empty property now than has been the case for some time. According to official returns, there were 426 new houses completed during the year, and at present some 200 are in course of erection.—*Grimsby News.*

BUILDING IN HULL.—Many imposing buildings were erected in Hull during the year 1901. Indeed, the erection of fine buildings was an outstanding feature in connexion with the vastly-improved aspect the city assumed during that period. The number of plans passed by the Works Committee was equal to that of the previous year—which was one of the busiest in the history of the building industry in the port—and the character of the structures has seldom been equalled in any one year. The building trade was not so brisk in the small house class—that of the speculating or investing builder—and had it not been for the pulling down of a great amount of old property on sites required for the new streets and the reinstatement of premises required for business purposes, the trade would have been somewhat slack, despite the fact that prices as regards material had gone down considerably. The pulling down of old property and the opening of the new streets necessitated new properties, and consequently the trade became busy at once. The price for labour maintained its old position, and to a certain extent was the means of stopping the amount of capital which otherwise would have been invested in buildings. The old year closed, and the new one has opened upon a steady advance in the price of timber and other building materials, and this, no doubt, to a certain extent will check building so far as investment and speculation goes. The present year will in all probability be brisk, considering the large number of buildings which must be erected in the new streets—the erection of the Rowton Homes, the extension of the Hull Royal Infirmary, the opening of the new square between Waterworks-street and Carr-lane, and the erection of a public hall, a new central police-station, the new art school on the Anlaby-road, a new theatre in Charlotte-street, a new Catholic church in Spring-street, Catholic orphans' home, new churches at Wilmington, Dairycoates, and Albert-avenue; extension of the Town Hall; new central post office in Alfred Gelder-street; seventy-seven new artisans' dwellings; and, of course, the important business premises on the sites in King Edward-street and Jameson-street. Although nothing definite is known, it is expected, also, that substantial building will take place on account of the North-Eastern Railway Co.'s intentions with regard to the improvement of Paragon-street Station. Building has been particularly stagnant on the East side of the city, probably on account of the closing of Earle's Yard. It will be remembered that towards the latter end of 1901 the progress in the work of new buildings received a check on account of the strike of operative slaters, but the slating contractors coped with the difficulty by employing outside labour, so that the check, happily, was only a momentary one.—*Eastern Morning News.*

UNIVERSITY OF BIRMINGHAM.—At the second annual Court of Governors of the University of Birmingham, the report of the Council was read. With regard to the new buildings, a committee has been appointed and the plans approved of Messrs. Aston Webb and Ingress Bell for utilising the land presented by Lord Calthorpe. Considerable progress had already been made in the formation of a new road, to be called University-road, and the levelling of the site. It had been decided to erect in the first instance a University Hall of large dimensions (150 ft. by 75 ft.), and three departmental blocks, two on the west and one on the east side of the hall; the whole fronting to the arc of a semi-circle, the diameter of which was University-road (the new thoroughfare running from the railway into Edgbaston Park-road, and nearly parallel with Bristol-road). In those buildings it was proposed to install a complete engineering department, including mechanical engineering, civil engineering, and electrical engineering, which would occupy two blocks, while the third block would accommodate the new departments of mining and metallurgy. In another part of the ground would be built a power station, and also a forge and foundry, all three being connected with the engineering department.

Y.M.C.A. BUILDINGS, HEREFORD.—A two-story building is now in course of erection in St. Owen-street, Hereford, for the Young Men's Christian Association. It will be built of Hampton Park bricks and terra-cotta dressings, and will be Renaissance in style. It is being erected from plans prepared by Mr. W.W. Robinson, architect, Hereford. The assembly-room itself, which will be open to the roof, will measure 42 ft. by 22 ft., and will be heated by Shoreland grates, though provision has been made for hot water apparatus. It will have a wide entrance porch. On the ground floor there will also be a class-room and two anterooms. On the first floor there will be a room 28 ft. by 14 ft to be used as a reading-room. The builder is Mr. William Powell, Hereford.

BUILDINGS IN NEW-STREET, BIRMINGHAM.—The scheme for the erection of arcades connecting New-street with High-street and Union-street, now nearing completion, is to be followed by the erection of another block of buildings which will front upon New-street. The new arcades, the Midland and the City, will open out of New-street at some little

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distance from each other, and the frontage between is to form the site of the projected block. Messrs. T. W. F. Newton & Cheatle have prepared designs for an erection which will be in keeping with that of the arcade entrance. The new buildings are to be finished by October next. They will contain four large shops, about one hundred offices, and five sets of warehouses at the back. The various floors will be served with an electric lift. The buildings, although not owned by the City Arcades Co. (Limited), will, in a sense, be part of the general scheme for developing that end of New-street which has been in progress for four years past.—*Birmingham Post.*

TALL CHIMNEY, BRADFORD.—On the 13th inst., at the new generating station which is being erected in Valley-road by the Electricity Committee of the Bradford Corporation, the last brick was laid of the new chimney which has just been erected. The chimney was designed by Messrs. Mawson & Hudson, architects; and was built by Messrs. C. Murgatroyd & Sons, contractors, under the supervision of Mr. N. A. Atkinson, clerk of works. The chimney is built of brick, and stands on a concrete base. The concrete is 30 ft. square by 11 ft. 8 in. thick. The base of the brickwork is octagonal in shape and 32 ft. across. At the ground level the chimney is circular in form, and is 29 ft. 4 in. diameter outside, and tapers to the top to 15 ft. 4 in. diameter outside. The chimney is 13 ft. diameter inside, and is parallel from bottom to top. The height is 204 ft. from the finished floor level, and the foundations extend 32 ft. below this.

GUARDIANS' BOARDROOM, WANDSWORTH.—The boardroom of the Wandsworth and Clapham Union Board of Guardians at the Union Offices, St. John's Hill, Wandsworth, was reoccupied on Thursday, the 9th inst., after undergoing enlargement and rearrangement during the last six months. A new committee-room and a connecting corridor have been built in connexion with the boardroom, the waiting-room enlarged, and the lavatory accommodation also re-arranged and enlarged. The boardroom and committee-room are fitted with an electric light installation. The dado and doors in the boardroom are in solid polished walnut wood, with plaster pilasters and detachable columns above the dado. The warming is effected by a large open fireplace, supplemented by hot-water radiators, and the ventilating by fresh-air inlets and two of Blackman's electric exhaust fans. The work has been carried out at a cost of about 2,700*l.* by Messrs. Wilson Bros. & Lamplough, builders, of Kensal Rise, from the designs and under the superintendence of Messrs. Lansdell & Harrison, architects, of London.

NEW HOSPITAL, SUTTON.—A new hospital was opened at Sutton recently. Mr. Cecil A. Sharp was the architect and Mr. J. B. Potter the builder, both of Sutton. The site is situate in Hill-road. The building has accommodation for twelve patients.

PUPIL TEACHERS' COLLEGE, LIVERPOOL.—On the 6th inst. the Bishop of Liverpool (Dr. Chavasse) dedicated the new Church Pupil Teachers' College, in Colquitt-street, which has been founded in memory of the late Canon E. H. M'Neile. The Liverpool and District Church School Managers' Union purchased last year the site of the building which used to be known as the Art Gallery of the Royal Institution, in Colquitt-street, the old premises being acquired at the same time. The old building, with certain necessary extensions, has, at a cost of about 8,000*l.*, since been partially reconstructed and adapted from plans prepared by Messrs. Pain & Charles Blease, architects. The college is externally of brick and stone, and is situate at the junction of Colquitt-street and Seel-street. On the ground floor there are two science classrooms, each capable of accommodating fifty students, a gymnasium, cloakrooms, principal's office, cycle store, &c. On the first floor there are two classrooms, each with accommodation for forty students, a library, and a lecture hall. Another classroom and a first-class laboratory occupy the second floor.

BUSINESS PREMISES, PERTH.—A new street is being formed in Perth between South-street and High-street, at the back of the City Hall, with cross street at right angles, to join South St. John's-place. The first block or feu has been taken for premises to be erected for Messrs. Stewart & Dick, wholesale provision merchants and commission agents. These have a frontage of about 55 ft. towards the main street, and extend 105 ft. towards the cross street. The whole work is to be carried out under the supervision of Mr. David Smart, architect. The following are the contractors for the work, viz.:—Mason work, Robert Brand & Son; joiner work, Hay & Sim; slater work, James Buchan & Son; plumber work, James MacLeish (all of Perth); and plaster work, Alexander M'Ritchie, Dundee; while the steel beams are to be provided by P. & W. MacLellan & Co., of Glasgow.

FLEET-STREET WIDENING.—With the sale by Messrs. Douglas Young & Co. on the 22nd inst. of the corner site adjoining the Old Bell, in Fleet-street, the important improvement at this end of the thoroughfare will be completed. The erection of modern buildings on these sites is removing all traces of the past in this most interesting part of Old London.

FOREIGN.

FRANCE.—The Government have commissioned from M. Joseph Blanc a cartoon for a tapestry which is to be executed at the Gobelins manufactory, and is intended as a decoration for the Paris Hôtel de Ville. It will represent the arms of the city of Paris with the Cross of the Legion of Honour, and a lion (symbolic of force) beneath.——The large hall at the Invalides, situated above the principal entrance, is being fitted up as a military museum.——The Equitable Insurance Co. of the United States is to open an architectural competition for the buildings to be erected for it in Paris. ——The late M. Rouyer has left by his will a fund for the foundation of an architectural prize in connexion with the Académie des Beaux-Arts.——There is talk of prolonging to Boulogne and St. Cloud the metropolitan railway line which at present ends at the Trocadéro.——A monument to the memory of Pasteur is to be erected in the small town of Marnes (Seine and Oise), the architectural portion by M. Jaumin, the sculpture by M. Chailloux.——The municipality of Rouen are about to erect a Bourse de Travail, at an estimated cost of 375,000 fr. ——M. Malençon is the architect selected to carry out the new hospital of St. Lo.——M. Woilles, architect, of Beauvais, has been elected president for this year of the District Society of Architects of the Oise; and M. Jouvenin, of Fontainebleau, president of the District Society of the Seine and Marne.——M. Moyaux, architect, has prepared the plans for the proposed additions to the Institut building, which are to replace the portions that will be destroyed by the prolongation of the Rue de Rennes. The new buildings will have a façade on the new portion of Rue de Rennes, and will be in the rear of the dome and aisles facing on the quay, which will remain intact.——There is talk of a new bridge over the Seine, between the Pont d'Ivry and the Port à l'Anglais.——A marble bust of Hittorff, the eminent architect and archæologist, has been placed in the Académie des Beaux-Arts.——M. Jules Doré, architect, has been commissioned to build new abattoirs for the town of Mortagne.——The immense bronze statue of Vercingetorix, by M. Bartholdi, which was exhibited in the Grand Palais last year, has been transported to Clermont-Ferrand by means of an automobile waggon, the railway company having refused it.——M. Delfortrie has been elected President of the Architectural Society of the North of France, and M. Santu President of the Architectural Union of Lyons.——M. Nénot has been appointed architect to the Panthéon, in place of M. Deschault, who is superannuated; and M. Sortais has been appointed architect to the Ecole des Arts Decoratifs.——The Municipal Department of Architecture at Paris is about to take in hand the restoration of the church of St. Séverin.——The death is announced, at the age of fifty-five, of M. Felix Albert Marquet; and also that of M. Henry Carreaux, at the age of fifty-three. Both were architects, and members of the Société Centrale. M. Carreaux had been educated in the Pacard atelier.

INDIA.—The foundation-stone of the new Chief Court of Lower Burma has recently been laid by the Viceroy of India.——The Secretary of State has sanctioned the construction of a line of railway, 5 ft. 6 in. gauge, from Malakwal to the Karana Hills; the works will be under the control of the Director of Railway Construction.——It is announced that the proposed memorial hall to be erected in Singapore to Queen Victoria will adjoin the Town Hall, and be on the site now occupied by the temporary Supreme Court. The new building will be of similar design to the present Town Hall, but higher, the front façade of the latter being remodelled to harmonise with the former. A central tower, 150 ft. high in front, and an arcade in the centre will connect the two buildings. The cost is estimated approximately at a quarter of a million dollars.

MISCELLANEOUS.

YORK MASTER BUILDERS' AND CONTRACTORS' ASSOCIATION.—The annual meeting of the York Master Builders' and Contractors' Association was held recently at the old George Hotel, Pavement, the President (Councillor G. Mansfield) in the chair. The annual report, which showed a very satisfactory year's working, was read and adopted. Councillor Mansfield was re-elected President, and Mr. C. Prudames was re-elected Vice-president. The President (Councillor Mansfield) has been elected to the position of President of the Yorkshire Federation of Building Trades Employers. The best thanks of the Association were accorded to the President, vice-president, and treasurer for their services during the past year.

ELECTRIC LIGHT, WORKSOP.—On the 9th inst. Colonel Hepper, D.S.O., R.E., Inspector to the Local Government Board, held an inquiry at the Town Hall, Worksop, in respect of the application of the Urban Council for permission to borrow 8,500*l.* for the extension of the electric lighting plant. The Consulting Engineer (Mr. A. B. Mountain, of Huddersfield), said the present number of consumers was seventy-seven, representing 3,879 lamps of 8 candle-power, and there were thirty-five arc lamps in the street, representing 591 lamps of the same power. Nineteen prospective consumers had applied, and it was proposed to fix forty incandescent lamps in the side streets, representing an addition of 1,023 lamps.

ELECTRIC POWER STATION, NOTTINGHAM.—On the 9th inst. the last brick of the big chimney shaft at the new power station in St. Ann's Well-road was laid by the chairman of the electricity committee. There were present the City Engineer (Mr. Arthur Brown), the Electrical Engineer (Mr. H. Talbot), the Deputy City Engineer (Mr. T. W. Gordon), Mr. Thomas Barlow (contractor), and others. The height of the chimney above the ground is 220 ft., and the total height from the bottom of the foundation 254 ft. The foundation of the chimney is upon a concrete base 39 ft. square. The diameter of the chimney at the top (inside) is 13 ft. 6 in. Inside the chimney are two iron pipes, each 30 in. diameter, through which the exhaust steam is taken and delivered at the top of the chimney.

DONCASTER ELECTRICITY UNDERTAKING.—The application of the Corporation of Doncaster for permission to borrow a further sum of 16,487*l.* for the purpose of carrying out their electric lighting scheme was the subject of a public inquiry on the 8th inst. before Colonel Hepper, of the Local Government Board. Among those present were Mr. Wyld (electrical engineer), Mr. W. H. Crabtree (Borough Surveyor), and others. The Town Clerk (Mr. T. Sugden) said the object of the proposed loan was to make good an excess of the expenditure in connexion with a former loan for additions carried out during the construction of the works, and for further extensions, particularly for plant to supply current to the tramways undertaking.

THE NEW CATHEDRAL, CAPETOWN.—A sum of 20,000*l.* has been subscribed, mainly from colonial sources, towards the erection of the nave, aisles, tower, cloisters, chapter-house, and other parts of Capetown Cathedral, for which plans and designs have been prepared by Messrs. Baker & Masey. It is calculated that the entire fabric will cost 130,000*l.* An appeal is made for contributions of 28,000*l.* to the Memorial Fund of 35,000*l.* wherewith to defray the cost of building the choir with the memorial chapel and organ chamber.

THE PATENT OFFICE AND THE NEW LIBRARY.—The new library at No. 25, Southampton-buildings, was opened to the public on Thursday last week. It has been erected upon the site of the former library block, in the area which is surrounded by the new buildings for the Patent Office, which were begun about twelve years ago with the erection of the Sale of Specifications department between Took's-court and Quality-court, Chancery-lane. In Quality-court may yet be seen what we believe is the last work, in London, by Sir William Chambers that was completed during his lifetime. It forms the southern façade—a Classic Order with rusticated ground floor and an angle-pediment in Portland stone—of the offices which were originally built for the then Masters in Chancery, who removed thither from Symond's Inn, and which were subsequently taken for the Commissioners of Patents. On either side of the doorway, in Quality-court, were the offices of the "Secretaries of Bankrupts and Lunatics." The new buildings have been erected by Messrs. Perry & Co., contractors, from plans and designs prepared in the Office of Works, at a total estimated cost of about 162,500*l.*

"THE LONDON MANUAL" FOR 1902.—The sixth edition of this work has been brought well up to date, and included in its pages are several illustrations or diagrams of metropolitan improvements contemplated or in progress. The Manual contains a complete, but brief, account of how London is governed, including descriptions of the work of all public authorities and departments of the public service; a good index; an apparently reliable list of public officers; illustrations of the mayors' chain and badge of several of the London boroughs; and a good many portraits of leading municipal workers. The Manual, which is published by Edward Lloyd, Ltd., Salisbury-square, E.C., is a neat and handy work of reference.

"WILLING'S PRESS GUIDE."—The twenty-ninth annual issue of this excellent guide (published at 125, Strand, W.C.) has been carefully revised. The guide is one of the handiest and best works of the kind, and the information in it is arranged in an admirable way.

APPOINTMENT OF ARCHITECT, EDINBURGH SCHOOL BOARD.—On the 10th inst. the School Management Committee of the Edinburgh School Board met to appoint an architect and superintendent of works in room of the late Mr. Robert Wilson. Originally there were sixteen applicants for the office, but only the names of the following, which had been placed on a short leet, were before the Committee, viz., Messrs. R. M. Cameron, A. Lorne Campbell, James Carfrae, Henry F. Kerr, and H. Ramsay Taylor. The final vote lay between Mr. Carfrae and Mr. Campbell, and it resulted in ten supporting the former and three the latter. It was resolved accordingly to recommend that Mr. Carfrae be appointed. He has been in the employment of the late Mr. Wilson for the past twenty-four years.

LEIGHTON MEMORIAL AT ST. PAUL'S.—A part of the monument to be erected to the memory of the late Lord Leighton in St. Paul's Cathedral arrived at the sacred edifice on Monday. The monument, which has been executed by Mr. Thomas Brock,

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R.A., consists of a massive cenotaph of marble, surmounted by a recumbent figure in bronze of Lord Leighton, who is represented in robes. At the head and foot there are small allegorical figures, also in bronze. A tablet bears the inscription: "To the memory of Frederick Baron Leighton, of Stretton, painter, seventh President of the Royal Academy of Arts. This monument is erected by his many friends and admirers. Born December 3, 1830. Died January 25, 1896. He lies buried in the crypt of this cathedral." The site selected for the memorial is the first arch of the north aisle.—*City Press.*

ARBITRATION CASE.—Mr. Pollock, Official Referee, had before him this week a case in which the plaintiff, Mr. John Gaymer, carrying on business at North Walsham, under the style of Cornish & Gaymer, sought to recover from Mr. John Smith, of St. Mary Abbott's-terrace, Kensington, the sum of 1,090*l.*, balance due under a contract for the erection of the Grand Hotel, Mundesley, and for extras in connexion therewith. The defendant counterclaimed for a like amount (1,090*l.*), claiming such sum by way of penalty, and in the alternative as damages for the non-completion of the building within the time limited by contract. The case occupied the whole of the 13th inst., during the greater part of which Mr. Herbert J. Green, of Norwich, the defendant's architect, was under examination. On the 14th inst., on the Official Referee taking his seat, Mr. Bousfield stated that, by consent, judgment would be entered for the plaintiff for 1,000*l.* on his claim, with costs, and that judgment would also be entered for him on the counter-claim, with costs.

EFFECTS OF A RUSTED VANE-ROD.—An inquiry was held at Chatham on the 10th inst. by Mr. Alfred Hands, F.R.Met.Soc., in reference to a claim by the Churchwardens of Holy Trinity Church, New Brompton, against the insurance company for damage alleged to have been caused to the spire of that church by lightning on some date unknown. Some stones having fallen in July last, an examination was made, and cracks being found of such a nature as to render immediate repairs necessary, the work was carried out, and compensation was claimed under the fire policy, which, as usual, contained a clause including lightning risks. The company having disputed the claim, Mr. Hands was appointed arbitrator, and after hearing expert evidence on both sides, and examining the broken stones which had been preserved for the purpose of the inquiry, decided that the damage was not caused by lightning but was due entirely to the rusting of the vane rod which passed through the stones, and therefore that the insurance company was not liable.

ENGLISH ELECTRICAL WORK IN PARIS.—In connexion with the celebrations on the occasion of M. Waldeck-Rousseau's visit to St. Etienne on Sunday and the opening of the new Prefecture buildings, it may be of interest to know that the French representatives of "Electric Lighting Boards, Ltd.," received from the Government the order for the electrical illuminations, the extent of the contract being for 1,250*l.*, and including as many as 4,000 lamps. A further important contract has also been obtained from the Paris Illuminating Company, no less than 30,000 ft. of flexible cable, 1,000 superficial feet of boards, and 15,000 lamps having to be provided.

MATTHEW HENRY'S CHAPEL, CHESTER.—Sir John Brunner, M.P., unveiled, at a special dedication service, two stained glass windows which he has presented to this chapel to commemorate its bi-centenary. The windows, which consist of three lights, contain in the centre ones figures of Matthew Henry and Dr. James Martineau respectively, and the side lights are filled with foliated ornament. The work is from the studio of Messrs. Powell Brothers, of Leeds.

CAPITAL AND LABOUR.

BRADFORD BUILDING TRADE DISPUTE.—The dispute which has been proceeding between the master masons and their operatives in Bradford was brought to a settlement on the 13th inst. after a cessation of work which has lasted since May 1 of last year. At the request of the Mayor, the representatives of the employers and the operative masons of the city met him at the Town Hall for the discussion of the matter. A letter had previously been received by the Mayor from the Bradford Trades and Labour Council, who gave hope that a settlement of the dispute might be effected, and upon the invitation of the Mayor the Master Builders' Association appointed as their representatives Alderman Holdsworth, Mr. Wallace Daykin, and Mr. A. Gadie, while the local branch of the Operative Masons' Society appointed Mr. T. Dalbridge, sen., Mr. T. Dalbridge, jun., Mr. R. Craggs, and Mr. Thomas Brown as their representatives. Concessions from the original demands were made on both sides, and a desire to arrive at an amicable arrangement was manifested on both sides. Under the arrangement the masons will resume work at a reduction of wages of ½d. per hour, and agree to work peaceably with non-unionists, while the masters withdraw a demand for a change in the dates on which notices of alterations in the conditions of work should be given.

LEGAL.

ACTION BY A DISTRICT COUNCIL FOR THE REPAIR OF A HIGHWAY.

IN the King's Bench Division, on the 11th inst., Mr. Justice Walton delivered a considered judgment in the case of the Esher District Council *v.* Marks, an action brought by the Urban District Council of Esher and the Dittons against the defendant, Mr. H. Marks, of Ember Court, near Thames Ditton, to recover 137*l.* 10s. 5d., the amount expended by the plaintiffs in repairing a highway known as Ember-lane. It appeared that in 1773 a Mr. George Onslow, the owner of the Ember Court estate, which was a manor of the parish of Thames Ditton, obtained the licence of the King to close up an old highway for carts, carriages, and foot passengers which passed through his property and ran from Thames Ditton and Esher to East and West Molesey. Mr. Onslow made a new road in substitution for the old one and undertook that it should be kept in good and sufficient repair by him, his heirs, and assigns. There was no dispute at the trial that Ember-lane, as originally laid out, was the road which Mr. Onslow was required to provide in the place of the old highway which he had stopped up and enclosed, and there was no evidence that it had ever been repaired by the inhabitants or any public body. In April, 1900, the Surveyor of the District Council discovered that the road was in a bad state of repair, and called upon the defendant, who was the owner of a portion of the original Ember Court estate, to repair it. The defendant denying liability the plaintiffs executed the necessary work and brought the present action to recover the amount they had expended.

His lordship now held that the road in question which was made in substitution for the old one, was, under the circumstances, repairable *ratione tenuræ*, and that the defendant was liable to repay the amount which the plaintiff Council had expended, and gave judgment for the plaintiffs with costs.

Mr. Macmorran, K.C., and Mr. Manisty, K.C., appeared as counsel for the plaintiffs; and Mr. Robson, K.C., and Mr. G. F. Hart for the defendant.

CASE UNDER THE 1894 BUILDING ACT.

AT Guildhall on Monday, Alderman Dr. Crosby gave his decision in the case of "Woodthorpe *v.* the Charing Cross and Strand Electric Supply Corporation (Limited)."

This was a summons under the 145th Section of the Building Act, at the instance of Mr. Edmund Woodthorpe, the District Surveyor for the northern division of the City, for beginning certain works without having served a notice upon him. The complaint was that defendant company had failed to give him any notice concerning an inspection-box that was in course of erection at the corner of Bishopsgate-street Within and Wormwood-street, and he complained of certain defects in construction. A point of law was raised by Mr. Shiress Will, K.C., first that this was not on all fours with the Whitechapel case, and that the special powers under which this electric lighting company carried on their works excluded them from the provisions of the Building Act. The date of the statute of the Building Act was 1894, while the provisional orders under which the company carried on their works were granted in 1899. The interests of the public were protected by a special code.

The Alderman said he had carefully thought over the facts of the case, and found that the company were the persons causing and directing the works in question. The work was a street-box for the purpose of inspection in connexion with electric energy, and he found that the company had not given notice in accordance with Section 145 of the Act. He held that this was a building structure, or work within the meaning of the Act, and he was unable to distinguish this case from the Whitechapel case. He convicted them, and imposed a fine of 40s. and two guineas costs.

Mr. Will: I have to ask the Court to state a special case in order that I may bring the matter by way of appeal.

The Alderman: I am sorry I cannot state one, because a special case on this point has been argued before a Divisional Court of three judges, two of whom were in favour of, and the other did not dissent from, that view. The matter has been fully argued in the Whitechapel case.

Mr. Will: As I understand the law, it is the duty of the court to state a special case, unless it is of opinion that the application is frivolous. I do not think that that can be said of this application. The High Court will have power to appoint a special divisional court, consisting of more than six judges, and such a court would be proper and have power to over-rule any other divisional court. It is with a view of getting finality in the matter. No harm can be done. Continuing, Mr. Will said he had another alternative, under the statute of 1870, to apply to the High Court for a rule nisi to enable the court to state a case.

The Alderman said he had no wish to be any obstruction, but in face of the ruling of the judges, and his own commonsense view of the case, he could not accede to the application. It would be like setting up his decision against that of the judges.

MARYLEBONE BUILDING DISPUTE.

THE case of White *v.* Harrow and Harrow *v.* the Marylebone District Property Co. came before the Court of Appeal, composed of Lord Justices Vaughan Williams, Stirling, and Cozens-Hardy, on the 14th inst. on the appeal of Mr. Harrow against a decision of Mr. Justice Joyce in the Chancery Division.

It appeared that White was the lessee from the Howard de Walden Estate trustees of No. 24, High-street, Marylebone, for a term of years expiring in 1932. On August 3, 1899, White sublet the house to Harrow for twenty-one years, together with all easements and appurtenances belonging to the premises. This lease contained a covenant by the lessee that he would not do anything to interfere with the quiet enjoyment of the adjoining premises nor object to any works to adjoining premises which might be sanctioned by the lessor or the superior landlord, nor claim any easement against the lessor or his superior landlord over any adjoining or neighbouring premises by reason of any act or thing done or suffered by any tenant of such adjoining or neighbouring premises. The lease also contained the usual covenant by the lessor for quiet enjoyment of the premises. The District Property Company having acquired an interest in the adjoining property to No. 24, High-street, and forming part of the same estate, proposed to erect some buildings which Harrow said would obstruct the light of his premises and brought an action to restrain the company from building so as to obstruct his light. The proposed buildings had been approved by the surveyor of the estate. White, who was then interested in the company, then took proceedings to restrain Harrow from prosecuting his action on the ground that it constituted a breach of his covenant. Mr. Justice Joyce held that the covenant which had been entered into by Harrow precluded him from raising objection to building works sanctioned by his lessor and the superior landlord, and stayed the proceedings in the action. From this decision Harrow appealed.

At the conclusion of the arguments, their lordships allowed the appeal, Lord Justice Vaughan Williams observing that in his opinion the word "adjoining" in the covenant meant "adjoining" in the sense in which the word was used in the Metropolitan Building Act, 1894. It was plain from the other parts of the lease that the word "adjoining" could not be used in this particular covenant in the sense of neighbouring. A narrower interpretation must be put on the word "adjoining."

The other Lords Justices concurred.

Mr. Younger, K.C., and Mr. Ford appeared for the appellant; and Mr. Hughes, K.C., and Mr. Wace for the respondent.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

16,483.—A PORTABLE ELECTRICAL BATTERY: *M. E. Fuld.*—The cell, induction-coils, and connexions are placed in a false top, which is pivoted in the upper portion of the case or box, and the terminals, &c., are disposed in the space thus obtained. The handle of the switch will, as the box is being closed, be lifted by the cover so as to break circuit automatically.

16,494.—A GULLY TRAP: *S. Chattwood.*—A tubular extension of the dished cover seals the trap. A pipe, which is carried up to the roof, ventilates a chamber into which gas may pass from the drain, the chamber, in most instances, being that which is fashioned upon the outlet side of the trapping plate.

16,531.—PROCESS OF MOULDING BLOCKS OF ARTIFICIAL STONE: *A. Fannetaz.*—A platform which will rotate upon a middle column carries three moulds, in one of which a hydraulic ram presses the material whilst another mould is being charged, and a chain removes the block from the third mould, at the bottom of which is a plate connected with rods that are yoked to the chain. The chain is also secured to one side of a pulley upon a shaft, on which is a smaller pulley that carries the chain of the ram. By the use of steel plates in the moulds one can make half- and quarter-sized blocks.

16,626.—A REGENERATIVE GAS LAMP: *W. H. Welch.*—For the lamps specified in No. 8,318 of 1895, and for those that have either annular burners or vertical or horizontal flat-flame burners. In the case of the last-named kind a cone closes the lower ends of tubes fashioned in the casting which supply air from above to be heated as it impinges against the cone on its way to the flame, and there is a casing that impels the warmed air upon the upper surface of the flame. For a lamp having an annular burner the air-current traverses apertures in the cone and cross-tubes as it flows to an annular chamber.

16,629.—A STRETCHER FOR ARTISTS' USE: *A. F. Tait.*—The bars of the stretcher are mitred at their ends, and are fastened together with triangular plates that fit into slots, dowel pins, and a

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middle cross-bar. Each corner key has a body and a wedge shank with staggered teeth and a concave pointed end. The keys for the cross-bar are similarly shaped, but one side of the shank is straight.

16,030.—ANGLE-BARS FOR STRUCTURAL PURPOSES: *G. A. Weber.*—The bars are rolled so as to present outside strengthening ribs, in which may be cut recesses to facilitate the fixing of the bars on to supports, and through which bolts, rivets or spikes can be inserted.

16,050.—A VICE: *A. Peter.*—A piston which is worked with compressed air or with hydraulic pressure, moves the sliding jaw of the vice, and a rod, or a rod and lever, join the piston to the spindle; when the spindle is turned into engagement with half-threads on the jaw and spindle the jaw becomes locked, or it may be locked with a cam or bent lever.

16,661.—A VARNISH-CAN AND PAINT-POT: *C. Leiscring.*—On the top-plate of the can is secured an open-ended funnel, of which the lower end reaches nearly to the bottom of the can. On the top-plate over the funnel is a ring, and in the cover is a hole for the brush-handle, a ring at the bottom holds the cover when the can is being used as a paint-pot. For use as a varnish-can the stopper is taken out of its place, varnish is poured through another inlet and will then rise in the funnel, its further flow being regulated by replacement or removal of the stopper.

16,665.—A BENCH CRAMP: *R. Charles.*—Spikes are employed for securing a base-plate to the bench. On the plate slides a rack, the work is gripped by a spiked head of the rack and, at the other end, with the customary stopping-piece. A lever, having a toothed-sector, moves the rack which, when so adjusted, is to be clamped by means of an eccentric and a lever that extends therefrom.

16,724.—SPRING-STOPS FOR WOOD-WORKING MACHINES: *J. Rawlinson.*—The inventor seeks to provide means of bringing the wood readily into a series of pre-arranged positions in the working of mortising, sawing, and similar machines. For one after the chain-mortising kind, he causes springs to force a set of studs upwards through the table, of which the under-side grooves afford free motion for the studs and springs, after the end of the wood has been set against one stud and a mortise has been cut by feeding the chain-cutter downwards. The wood is passed over and depresses the stud, and is then forced against the next stops in succession. In order that mortises may be cut right through, recesses are made in the table.

16,730.—A WORKMEN'S TELL-TALE: *C. J. C. Krumm and C. A. Krumm.*—A clock-train, fitted with cams and levers having anchors that engage with lug-wheels, drives wheels which print the hour and five-minutes intervals. The pulling of a draw-bar bearing rollers that run against steps, which are set obliquely within a platen block, causes the impressed cards to fall into a shoot, as the platen trips a detent from a hinged shelf, which is then set again; a too quick return of the shelf (through the quick return of the platen) is obviated by means of a lug on the side of the tail of the shelf which a spring joins to the platen, and a foot, with a toe, upon the platen; the toe will trip to one side a crooked spring that sustains a shelf, and the shelf, having fallen, will return to its normal place only after the passing of the foot over the lug.

16,733.—TILES FOR ROOFS: *A. Gustorf.*—The under and lower edges of the tiles have interlocking ribs and grooves, and grooves and ribs respectively, and the tiles have projections and recesses at their sides which similarly engage with one another. In the upper face of each tile are drainage grooves that extend upwards to the point of meeting, and the upper ends of the upper stop-grooves are closed.

16,775.—MEANS OF CUTTING SHEET LEAD, ZINC, COPPER, &C.: *C. W. West.*—Levers and a link cause the knife to traverse a slot cut lengthwise in a bed on which a slotted plate holds the sheet metal in its place, the distance of the plate above the bed being equal to the thickness of the metal. The machine, which is intended also for cutting sheets of india-rubber, leather, or cardboard, may be fitted with graduated measuring-bars upon its delivery side, and the knife is attached to, or is made of, the sharpened edge of the traversing plate.

16,797.—DREDGING APPARATUS: *O. Frühling.*—To facilitate the transfer of the material to the dumping-ground are devised adjustable openings and a pipe, fitted with a suction-pump, as an outlet from the chamber into which the spoil has been dredged. In front of each opening is another adjustable opening that communicates with one or two pipes, of which the remoter ends are in the sea. Each pair of openings can be closed separately, and an arrangement of cross webs, together with jets of water under pressure, prevent the spoil from stopping up the openings.

16,798.—ELECTRICAL-CONDUCTOR CONDUITS: *J. Zappe.*—Multiplied tubes, with it may be metal linings, are fashioned in blocks of cement, which are then laid in the form of conduits, with a rounded surface for the top layer. The blocks are fitted together with dowel and mortise and tenon pins, bonding both crosswise and lengthwise, and may have an internal waterproof lining of pitch, &c.

16,817.—DRYING KILNS: *W. W. Hewitt.*—Kilns for drying clay, slurry, slip, &c., for cement, bricks, pottery, and kindred goods are disposed side by side, and waste gases are conveyed above and beneath the drying floors, at the alternate ends of which are the flues; a passage through the floors serves for the charging of coke into the oven, and the hot gases are directed from one kiln to another, or to the chimney, by a vertical flue at the top of each kiln and a common passage regulated with dampers.

16,805.—A SUPPORT FOR ELECTRICAL CABLES AND CONDUCTORS: *D. P. Regan.*—The support consists of grooved arms, of which the T or otherwise enlarged heads are adapted to fit in an upright, either in keyhole slots or by a quarter-turn for which a rounded neck is provided.

16,871.—AN ANTI-CORROSIVE COMPOSITION: *W. Rule.*—A paint for coating iron, steel, and other surfaces, and which is especially intended for maritime purposes, is made of a mixture of fine resin, carbon pitch, mineral pitch, white naphtha, black naphtha, zinc white, and Russian turpentine.

16,879.—A TOOL FOR USE IN CUTTING WOOD MOULDINGS: *R. H. Griffin.*—After the moulding has been adjusted at the angle desired against the face of a plate and against a set-screw that serves as a back-stop, an outer ring, which is fitted upon a ring secured at a right angle to the plate, is rotated by means of its handles, whereupon a knife on the ring shaves or cuts the end of the moulding.

16,896.—FLUSHING APPARATUS: *J. G. Davidson and J. Don.*—The flush is started by means of an electro-magnetical apparatus, of which it is contrived that the magnet shall liberate a catch which under normal conditions sustains the tipping-tank which starts the siphon. The invention comprises a similar method of raising the crown of a trapped bell-siphon.

16,927.—CAPS FOR PIT-PROPS: *W. Cadenbach.*—Caps for protecting the ends of wooden pit-props are fashioned, out of sheet metal, with indented keys or tongues for engagement with recesses cut in the ends of the props; the caps and their tongues may be made in one piece, or separated angular tongues, having a U-cross-section, can be riveted on to the cap-tongues.

16,949.—APPLIANCES FOR USE IN THE MOULDING OF BUILDING BLOCKS: *J. C. Sellars.*—For rolling and stamping machinery for solid blocks, and for the parts of machinery for solid or hollow blocks. A flexible rotatory shaft carries a pressing-roller, which is worked with handles that are mounted loosely upon the shaft. A sliding frame to be adjusted vertically with levers carries a set of plungers worked with springs and a belt-driven cam-shaft. Cams upon a flexible shaft reciprocate a sliding frame, upon which are stampers that ram the material in the mould. An inside ejector-ring is fitted in a loose lining or anti-suction metallic plate, whilst sliding guide-pins join a similar plate to the upper plunger, and cores or prints form recesses in the blocks for angle- or T-bars. Confer also No. 25,214 of 1899.

MEETINGS.

FRIDAY, JANUARY 17.

Architectural Association.—Mr. T. C. Cunnington on "Architectural and Constructional Engineering." 7.30 p.m.

Royal Institution.—Rt. Hon. Lord Rayleigh on "Interference of Sound." His Grace the President will, after the discourse, unveil and present to the Institution a bust by the late Mr. Onslow Ford, R.A., of Sir Frederick Bramwell, Bart., D.C.L., LL.D., F.R.S., Hon. Secretary of the Royal Institution from 1885 to 1900. 9 p.m.

Institution of Civil Engineers (Students' Meeting).—Captain H. Riall Sankey on "The Theory of Heat-Engines." 8 p.m.

Institution of Mechanical Engineers.—(1) Nomination of officers for election at the annual general meeting on February 21; (2) Mr. H. F. L. Orcutt on "Modern Machine Methods." 8 p.m.

SATURDAY, JANUARY 18.

The Builders' Foremen's Association (Memorial Hall, Farringdon-street, E.C.).—Eighth Annual Dinner, at the Holborn Restaurant. 6.30 p.m.

MONDAY, JANUARY 20.

Royal Institute of British Architects.—(1) To read the Deed of Award of Prizes and Studentships for 1901-1902. (2) Mr. Detmar J. Blow on "The Architectural Discoveries of 1901 at Stonehenge," illustrated by lantern slides. 8 p.m.

Society of Arts (Cantor Lectures).—Dr. Samuel Rideal on "The Purification and Sterilisation of Water." II. 8 p.m.

Liverpool Architectural Society.—Mr. R. Wynne Owen on "The Value of Sketching," accompanied by lantern slides and some examples of original sketches by well-known architects. 6 p.m.

Glasgow Philosophical Society.—Paper by Professor G. G. Henderson, D.Sc., entitled "Chemical Notes on Building Materials." 8 p.m.

TUESDAY, JANUARY 21.

Institution of Civil Engineers.—Paper to be further discussed: "American Workshop Methods in Steel Construction"; by Mr. H. B. Molesworth. 8 p.m.

Society of Arts (Applied Art Section).—Mr. Halsey Ricardo on "The Architect's Use of Enamelled Tiles." 8 p.m.

Architectural Association of Ireland.—Mr. G. P. Sheridan on "A Holiday on the Continent (Rome, Florence, Venice, Milan, &c.)," with lantern views. 7.45 p.m.

WEDNESDAY, JANUARY 22.

Society of Arts.—Rev. J. M. Bacon on "Scientific Observations at High Altitudes." 8 p.m.

Institution of Civil Engineers.—Students' visit to the Testing Works of Messrs. David Kirkaldy & Son. (Assemble at the Works, 99, Southwark-street, S.E.) 2.30 p.m.

Devon and Exeter Architectural Society (Plymouth, Devonport, and Stonehouse Branch).—Mr. Edmund Sedding on "Old Cornish Towers," with lantern illustrations.

Edinburgh Architectural Association.—Mr. Thomas Aldwinckle on "Public Baths and Wash-houses," illustrated by drawings and lime-light views. 8 p.m.

Institution of Electrical Engineers (Birmingham local Section).—Mr. W. Kingsland on "Surface Contact Systems of Electric Traction." 7.30 p.m.

THURSDAY, JANUARY 23.

Royal Institution.—Dr. A. S. Murray on "Recent Excavations at Delphi and in the Greek Islands." II. 3 p.m.

Institution of Electrical Engineers.—Mr. E. B. Wedmore on "Earth Currents Derived from Distributing Systems." 8 p.m.

Institution of Electrical Engineers (Dublin Section). Mr. W. Brew on "Inductive Circuits." 7.30 p.m.

FRIDAY, JANUARY 24.

Architectural Association Discussion Section.—Mr. F. G. W. Buss on "The Clerk of Works: His Duties and Responsibilities." 7.30 p.m.

Birmingham Architectural Association.—Mr. Halsey Ricardo on "The Gothic Revival."

Devon and Exeter Architectural Society (Plymouth, Devonport, and Stonehouse Branch).—Annual Dinner.

Glasgow Architectural Craftsmen's Society.—Mr. James Lochhead on "Hospital Planning and Construction." 8 p.m.

SATURDAY, JANUARY 25.

Institution of Junior Engineers.—Seventeenth Anniversary Dinner, at the Hotel Cecil, the President (Sir John Jackson, F.R.S.E.) in the chair. 6.30 p.m.

Dundee Institute of Architecture.—Visit to Perth.

SOME RECENT SALES OF PROPERTY

ESTATE EXCHANGE REPORT.

January 7.—By W. MARTIN & Co.

Peckham.—24, The Gardens, u.t. 72¼ yrs., g.r. 9*l.*, e.r. 45*l.* £550

January 9.—By S. H. DAVIDS & Co.

Bayswater.—5, Wellington Mews, f., r. 18*l.* 250

By LINNETT & LANE.

Willesden.—8 and 10, Disraeli-rd., u.t. 78¾ yrs., g.r. 10*l.* 325

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS &c.

	£ s. d.		
Hard Stocks	1 11 6	per 1,000 alongside, in river.	
Rough Stocks and Grizzles	1 9 6	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 5 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts ..	1 12 0	,,	,, ,,
Best Fareham Red	3 11 0	,,	,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,,	,, ,,

BRICKS, &c.

	£ s. d.		
Best Blue Pressed Staffordshire ..	4 6 6	per 1,000 at railway depot.	
Do., Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 5 6	,,	,, ,,
GLAZED BRICKS.			
Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	10 0 0	,,	,, ,,
Double Headers..	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers..	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	32 0	per ton, delivered.
Best Ground Blue Lias Lime..	25 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s od. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

[See also page 71.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*Laying-out Pleasure Ground	Aldershot U.D.C.	20*l.*, 10*l.* and 5*l.*	Mar. 1
*Proposed Public Offices	do.	100*l.*, 75*l.* and 50*l.*	Mar. 29
*Queen Victoria Memorial	The Committee	Not stated	No date

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c, Supplied by	Tenders to be delivered
Workhouse Laundry	Belfast Guardians	Young & Mackenzie, Civil Engineers, Belfast	Jan. 21
Road Extension, near Shotton, Wrexham	Trustees of Mr. B. Piercy	A. E. Johnson, Civil Engineer, Egerton-street, Wrexham	do.
Road Works, Colum-lane	Cardiff Corporation	W. Harpur, Civil Engineer, Town Hall, Cardiff	do.
Cast-iron Gas Pipes, near Manchester	Stretford Gas Company	H. Kendrick, Engineer, Gas Offices, Stretford	do.
Cast-iron Pipes	Chorley (Lancs) Corporation	J. W. Allin, Gas Engineer, Town Hall, Chorley	do.
Hospital, &c., London-road	Sheffield Corporation	Borough Surveyor, Town Hall, Sheffield	do.
School, Chapman-street	Kingston-upon-Hull School Board	Gelder & Kitchen, Architects, Lowgate, Hull	do.
Repairs, &c., at Schools	Leeds School Board	W. Packer, School Board Offices, Leeds	do.
Additions to Workhouse, Elm-grove	Brighton Guardians	H. S. Reed, Parochial Offices, Brighton	do.
Offices, &c., Broad-street	Bury (Lancs) Corporation	A. W. Bradley, Civil Engineer, Town Hall, Bury	do.
Paving Works, Broughton	Salford Corporation	L. C. Evans, Town Hall, Salford	do.
Surveyors' Materials	Downham Market R.D.C.	H. Wayman, Union Offices, Downham Market	do.
Electrical Equipment	Hunslet (Leeds) Guardians	Shepherd & Watney, Engineers, Greek-street Chambers, Leeds	do.
Making-up, &c., Junction-road	Brentford U.D.C.	N. Parr, Surveyor, Clifden House, Boston-road, Brentford	do.
Villa, Llangollen		Mr. Denny, Architect, Llangollen, N. Wales	do.
Road Materials	Acton District Council	D. J. Ebbetts, Surveyor, 242, High-street, Acton, W.	do.
Road Materials	Salisbury R.D.C.	D. W. Morrice, Surveyor, Homington, Salisbury	do.
Five Houses, Scar-lane, Golcar		J. Berry, Architect, 3, Market-place, Huddersfield	do.
Improvements to West Cliff	Cromer Protection Commissioners	Douglas & Arnott, Engineers, 15, Victoria-street, S.W.	Jan. 22
Conveniences, Burgate-street	Canterbury Corporation	A. C. Turley, Civil Engineer, Tudor Chambers, Canterbury	do.
Additions to Schools, Juniper Green	Colinton (N.B.) School Board	J. A. Carfrae, Architect, 3, Queen-street, Edinburgh	do.
Asphalte Works at Cemetery	Blaydon-on-Tyne Burial Board	J. H. Rogers, Blaydon	do.
Bandstand, &c.	Edinburgh Corporation	R. Morham, City Architect, City Chambers, Edinburgh	do.
Sanitary Conveniences, Burgate-street	Canterbury Corporation	A. C. Turley, Civil Engineer, Tudor Chambers, Canterbury	do.
Business Premises, Pow-street, Workington	Mr. T. Browne	J. S. Moffat, Architect, 53, Church-street, Whitehaven	do.
Whinstone Setts (500 tons)	Dundee Town Council	W. Mackison, Civil Engineer, 91, Commercial-street, Dundee	Jan. 23
Granite, near Coventry	Meriden R.D.C.	A. Seymour, 11, Priory-street, Coventry	do.
Fire-clay Goods	Bolton (Lancs) Corporation	W. Walch, Gas Office, Bolton	do.
Paving New-road, and Walsall-street	Willenhall (Staffs) U.D.C.	T. E. Fellowes, Engineer, Town Hall, Willenhall	do.
Electricity Works, Sculcoates-lane	Hull Corporation	A. E. White, City Engineer, Town Hall, Hull	do.
Granite and Slag (20,000 tons)	Sleaford (Lincs) R.D.C.	E. Clements, 74, Southgate, Sleaford	do.
Granite and Slag Road Metal	Brigg (Lincs) R.D.C.	F. C. Hett, Council Offices, Brigg	do.
*Road Making, Kerbing, Paving, &c.	Hackney Borough Council	Borough Engineer, Town Hall, Hackney	do.
*Extension of Electric Light Works	Hull Corporation	City Engineer, Town Hall, Hull	do.
Houses, Stabling, &c	Aston Manor U.D.C.	G. H. Jack, Engineer, Council House, Aston Manor	Jan. 24
Club premises, Raunds		Brown & Fisher, Architect, Wellingborough	do.
Street Works, Curzon-street to Albert-avenue	Hull Corporation	A. E. White, City Engineer, Town Hall, Hull	do.
Cast-iron pipes (2,560 tons)	do.	F. J. Bancroft, Engineer, Hull	Jan. 25
House, Ebbw Vale	Primitive Methodist Trustees	H. Waters, Architect, Beaufort, Ebbw Vale	do.
Villa, &c., Worsborough Bridge, near Barnsley		Senior & Clegg, Architects, 15, Regent-street, Barnsley	do.
Schools, Queenstown, Co. Cork.	Dr. Browne	J. F. Hynes, Architect, 21, South Mall, Cork	do.
Wrought Iron Piping	Blackburn Corporation	Borough Surveyor, Town Hall, Blackburn	do.
Drainage Works, Dale-street, &c.	Rugby U.D.C.	D. G. Macdonald, Civil Engineer, Council Offices, Rugby	do.
Road Works, Duke-street	Alderley U.D.C.	H. Sheldon, Surveyor, Alderley Edge	do.
12 Houses, Turberville-road, Llwynypia, Wales	Pontrhonnda Building Club	W. C. Pritchard, Glamorgan Offices, Llwynypia	do.
Fireclay Retorts and Bricks	Leigh (Lancs) Corporation	J. Foster, Gas Works, Leigh	do.
Road Metal, &c.	Birmingham Corporation	J. Price, Engineer, Council House, Birmingham	do.
Electricity Generating Station	Hartlepool Corporation	Borough Surveyor, Town Hall, Hartlepool	do.
Additions to County School, Ystalyfera	Glamorgan County Council	W. W. Williams, Architect, 63, Wind-street, Swansea	do.
Sewerage Works, Mundesley, Norfolk	Erpingham R.D.C.	T. I. Goldie, Engineer, Bank Plain, Norwich	do.
Road Works, Gregson-road, &c. (Contract 124)	Lancaster Corporation	T. C. Hughes, Town Hall, Lancaster	Jan. 26
*Fire Hose and Fittings, Horton Asylum, Epsom	London County Council	R. W. Partridge, 6, Waterloo-place, S.W.	Jan. 27
*Making-up Bevington and Warwick-roads	Beckenham U.D.C.	J. A. Angell	do.
Lodge, Engine House, &c., Bamford, near Sheffield	Derwent Valley Water Board	E. Sandeman, Civil Engineer, Bamford, via Sheffield	Jan. 23
*Road Making and Paving Works	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
*Street Improvement Works	Bromley U.D.C.	Council's Surveyor, Bromley, Kent	do.
Railway Station, South Shore, Blackpool	L. & Y. and L. & N. W. Ry. Cos.	R. C. Irwin, Hunt's Bank, Manchester	Jan. 29
*Supply, &c., of Articles and Works for 12 months	Chelsea Council	Borough Surveyor, Town Hall, King's-road, S.W.	do.
*Petty Sessional Courts and Offices	City and County of Bristol	T. Roderick, Architect, Clifton-street, Aberdeen	Jan. 30
Fire Station, The Crescent, Salford		H. Kirkley, Architect, 134, Deansgate, Manchester	Jan. 31
Houses at Main Depot	Wrexham Town Council	Borough Surveyor, Guildhall, Wrexham	Feb. 1
*New Sewers and Roads, Walmer	Walmer Estates, Co., Ltd.	Hinds & Son, Estate Agents, Walmer	do.
100 Houses, Penydarren	Merthyr Tydfil U.D.C.	T. A. Rees, Town Hall, Merthyr	Feb. 3
*Road Materials, Horse Hire, &c.	Leyton U.D.C.	W. Dawson, Town Hall, Leyton, E.	do.
*Annual Contracts	Hendon U.D.C.	Council's Engineer, Public Offices, Hendon	do.
*Extension of Electric Lighting Station	Shoreditch Council	J. R. Dixon, Town Hall, Old-street, E.C.	Feb. 4
Sewerage Works	Sudbury (Suffolk) Corporation	T. W. A. Hayward, Civil Engineer, Town Hall, Sudbury	Feb. 8
*Annual Contracts	Camberwell Council	Borough Engineer, Town Hall, Camberwell	Feb. 10
*Re-Erecting the Crown Bridge near Griffithstown	Panteg U.D.C.	D. J. Lougher, Engineer, Pontypool	do.
*Technical Institute, Library, &c.	Eastbourne Corporation	Borough Engineer, Town Hall, Eastbourne	do.
*Annual Contracts	Wandsworth Council	Town Clerk, Council House, Wandsworth, S.W.	do.
Railway Bridge, Newcastle-on-Tyne	North Eastern Railway Co.	C. A. Harrison, Central Station, Newcastle	Feb. 12
*Main Drainage Works, New Sewers, &c., &c.	Stamford Corporation	Engineer's Office, 6, Millstone-lane, Leicester	Feb. 17
*Main Drainage Works, Engine House, Cottage, &c.	do.	do.	do.
Alterations to Market	Wrexham Town Council	Borough Surveyor, Guildhall, Wrexham	Feb. 18
Cottage Hospital, Southwold, Suffolk		R. C. Cordon, Surveyor, Duffield, near Derby	Feb. 22
Road Metal, &c.	Belper R.D.C.	E. N. Cubitt, Architect, Brentwood, Essex	No date
Two Houses, Tulse Hill Station, S.W.		Mr. Sadgrove, 22, Surrey-street, Strand	do.
Additions to Fernhill Chemical Works, Bury, Lancs.		J. Sellers & Son, Architects, Union-Chambers, Bury	do.
Pair of Cottages, Bemerton, Salisbury		J. Harding & Son, Architects, 58, High-street, Salisbury	do.
Business Premises, High-street, Chepstow	Mr. H. Lewis	Swash & Bain, Architects, Newport, Mon.	do.
Additions to St. Vincent's Home, Hull		Brodrick & Co., Architects, 77, Lowgate, Hull	do.
House, Kirkland, Kendal	Mr. E. Hetherington	J. Hutton, Architect, Kendal	do.
Additions to Chapel, Melbourne-road, Leicester		H. Harper, Architect, 54, Long-row, Nottingham	do.

[*See also next page.*

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PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Assistant Surveyor & Divisional Superintendent	Westminster City Council	400*l.*	Jan. 27
*Assistant Surveyor & Divisional Superintendent	do.	300*l.*	do.
*Assistant Surveyors & Divisional Superintendents (2)	do.	250*l.* each	do.
*General Assistant to Divisional Superintendents	do.	160*l.*	do.
*General Assistant to Divisional Superintendents	do.	150*l.*	do.
*Chief Draughtsman	do.	250*l.*	do.
*Engineering Draughtsman	do.	190*l.*	do.
*Surveying Assistant	do.	180*l.*	do.
*General Draughtsmen (2)	do.	150*l.* each	do.
*Testing Assistant	do	156*l.*	do.
*Clerks of Works (2)	do.	156*l.* each	do.
*Inspectors (2)	do.	156*l.* each	do.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x & xxii. Public Appointments, pp. xix. & xxii.

PRICES CURRENT (*Continued*).

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Bath ,,	1 7	,, ,,
Farleigh Down Bath	1 8	,, ,,
Beer in blocks	1 6½	,, ,,
Grinshill ,,	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup)	s. d. 2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto	3 0	,, ,,
,, ,, 5 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor	11 15 0	per 1000 of 1200 at ry. dep.
,, best seconds ,,	11 5 0	,, ,,
16× 8 best ,,	6 12 0	,, ,,
20×10 best blue Portmadoc	11 5 0	,, ,,
16×8 best blue Portmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green	12 2 6	,, ,,
16×8 ,, ,,	7 5 0	,, ,,
20×10 permanent green	10 5 0	,, ,,
16×8 ,, ,,	5 17 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles	41 6	per 1,000, at rly. depôt.
Hip and valley tiles	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	15 10 0
Deals: best 3 by 9	13 0 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	10 0 0	11 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2 in. by 4½ in. and 2 in. by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft.)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	16 0 0
Second yellow deals, 3 in. by 11 in.	17 0 0	18 0 0
,, ,, 3 in. by 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	13 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	12 10 0	13 10 0
Battens, 2½ in. and 3 in. by 7 in.	10 10 0	11 10 0

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Petersburg: first yellow deals, 3 in. by 11 in.	19 0 0	20 0 0
Do. 3 in. by 9 in.	16 0 0	17 0 0
Battens	12 10 0	13 0 0
Second yellow deals, 3 in. by 11 in.	14 0 0	15 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	11 10 0	12 10 0
Do. 3 in. by 9 in.	11 0 0	12 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	13 10 0	14 10 0
,, ,, ,, 3 in. by 9 in.	12 10 0	13 0 0
Battens	10 10 0	11 10 0
Second white deals 3 in. by 11 in.	12 10 0	13 10 0
,, ,, ,, 3 in. by 9 in.	12 0 0	12 10 0
,, ,, ,, battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
¾ in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders ,, ,,	8 0 0	9 0 0
Angles, Tees and Channels, ordinary sections	8 2 6	9 2 6
Flitch Plates	8 10 0	0 0 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Sheet Iron, Galvanised, flat, best quality:—		
Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	12 15 0	- - -
Pipe in coils	13 5 0	- - -
Soil Pipe	15 15 0	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0	- - -
Thin ,,	0 1 1½	- -
Copper nails ,,	0 1 1½	- -
BRASS— Strong Sheet ,,	0 0 11	- - -
Thin ,, ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths	3½d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, fourths	4½d. ,, ,,
32 oz. thirds	5¼d. ,, ,,
,, fourths	5½d. ,, ,,
Fluted sheet, 15 oz.	3¼d. ,, ,,
,, 21 ,,	4¼d. ,, ,,
⅛ Hartley's Rolled Plate	2¼d. ,, ,,
7/32 ,, ,, ,,	2¾d. ,, ,,
¼ ,, ,, ,,	2¾d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 8
,, ,, ,, in barrels	,,	0 2 9
,, ,, ,, in drums	,,	0 2 11
Boiled ,, ,, in pipes	,,	0 2 10
,, ,, ,, in barrels	,,	0 2 11
,, ,, ,, in drums	,,	0 3 1
Turpentine, in barrels	,,	0 2 3
,, in drums	,,	0 2 6
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	,,	21 0 0
Best Linseed Oil Putty	per cwt.	0 8 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

[See also next page.

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TO CORRESPONDENTS.

P. S. M. (As you say "the smoke is not very noticeable when the flue is thoroughly heated," that seems to be the explanation.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BANCHORY.—For bank and agent's house in Banchory, for the Town and County Bank, Limited, Aberdeen. Mr. Robert G. Wilson, architect. Quantities by architect:—

Masonry.—George Wilson, Banchory ....
Carpentry.—J. Henderson, Aberdeen .....
Slating.—George Merson, Banchory.....
Plastering.—J. Bannochie & Sons, Aberdeen
Plumbing.—Thom & Strachan, Aberdeen....
Painting.—George Chrystall, Banchory ....
} £1,500

BIRMINGHAM.—For the erection of pavilions, &c., at workhouse, Erdington, for the Guardians of Aston Union. Messrs. C. Whitwell & Son, architects, 23, Temple-row, Birmingham. Quantities by Messrs. Thos. Jones and C. Whitwell:—

Surman & Son	£18,106	Giles & Son	£16,266
W. and J. Webb ..	17,719	W. Robinson	16,190
Barnsley & Sons ..	16,666	A. Colin Hughes ..	15,985
R. Merton Hughes	16,489	W. Harvey Gibbs..	15,725
Whitehouse & Sons	16,475	Thos. Johnson, Birmingham*	15,700
Lee & Sons.....	16,446		

DOVER.—For pulling down and rebuilding the Dewdrop Inn, Dover, for Messrs. Thomas Phillips & Co., Ltd. Mr. A. H. Steele, architect, Dover. Quantities by the architect:—

Keeler Bros...	£1,168 7 2	Beaufoy	£998 0 0
Turner & Co.	1,075 0 0	Austen & Lewis	988 0 0
Lewis & Sons	1,060 0 0	Stokes	970 0 0
Goldsmith & Tapley	1,050 0 0	Francis	962 0 0
Brisley & Co.	1,031 1 8	Griggs	940 0 0
		[All of Dover.]	

[Architect's estimate, £1,027.]

HOLYHEAD.—For the erection of school buildings, Kingsland, for the School Board. Mr. William Williams, architect, Holyhead:—

Williams & Sons....	£1,450	E., R., & J. Owen, Holyhead*	£1,074

HULL.—For rebuilding the Tally Ho, Bond-street, for Messrs. Moors & Robson's Brewery, Ltd., Messrs. Freeman, Son, & Yaskell, architects, 11, Carr-lane, Hull:—

T. Goates, Brunswick-avenue, Hull*..... £2,043

LLANFAIRFECHAN. — For alterations to St. Andrew's Hospital. Mr. C. H. Dorman, architect, Northampton:—

T. J. Owen	£735 17 9	R. & J. Williams	£605 10 0
Evan Jones	680 0 0	R. Jones	600 17 0
H. Martin	656 0 0	David Owen ..	547 9 0
W. G. Williams	619 2 1	Evan Humphreys, Llanfairfechan* ..	535 4 0
Jones & Williams	618 15 4		

PORT TALBOT (Wales). — For works at Church Bryn. Mr. F. B. Smith, architect, Port Talbot:—

R. Bridgeman	£587 5	Parker's Joinery & Cabinet Co.	£268 0
Lattey & Co.	385 0	Jos. Phillips, Altrincham*	265 0
Stephens, Bastow & Co.	369 0		
Parkstone Steam Joinery Co.	296 0		

REDHILL.—For erecting St. Joseph's Catholic Presbytery and Schools, Redhill, Surrey. Mr. William Bevan, architect, 12, Buckingham-street, Strand, W.C. Quantities by architect:—

J. P. Groome	£3,685 0	H. Heathfield ..	£2,175 0
Longley & Co....	2,779 0	A. B. Apted	2,143 0
Bagaley & Sons..	2,570 0	Nightingale & Son	2,109 0
Smith & Sons....	2,479 0	Cronk & Richardson.....	2,073 0
G. Minter	2,462 0	Roberts & Co. ..	2,055 0
J. Appleby	2,420 0	Davis & Leaney*	1,998 0
W. Wallis	2,385 0	E. Worsell (withdrawn).....	1,776 0
R. B. Amos.....	2,379 7	G. Martin (withdrawn)	1,726 0
J. Nicks	2,350 0		
Buckland & Waters	2,340 0		
Harris & Son	2,330 0		
J. & M. Patrick..	2,269 0		
Battley, Son, & Holness	2,197 0		

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The Builder.

VOL. LXXXII.—No. 3077 JANUARY 25, 1902

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Sketch Design for House for Rt. Hon. H. J. Gladstone, M.P. ..... Mr. John Cash, Architect.
"Highcombe Edge," Hindhead: Staircase ..... Mr. W. A. Pite, F.R.I.B.A., Architect.
Gresham's School, Holt, Norfolk ..... Mr. Howard Chatfeild Clarke, Architect.

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The "Practical" Column.

LESS than fifty years ago the design and erection of the largest buildings involved little or no engineering knowledge. In the absence of the various structural and other engineering details that characterise buildings of the present day, the architect was practically free to devote the whole of his attention to the design, and to its effective realisation, in materials which were thoroughly familiar to him. The builder had merely to erect enclosing walls of moderate thickness, of strength and stability that were generally far greater than the forces to be resisted; and within the walls only the most simple forms of construction were employed. At the present time, although the American system of building has not been adopted in this country, the use of steelwork is almost universal in all important structures. Even in such comparatively insignificant buildings as shops and business premises, it is unfortunately by no means unusual to find the entire front carried on steel girders, supported in turn by steel columns. Frequently the safety of an entire building appears to depend on the adequacy of one corner column for its required duty. If the architect leaves the design of such members to a contracting firm, serenity of mind and a sufficiency of that refreshing sleep which is so necessary for the human system can only be obtained by the exercise of an undesirable amount of confidence in persons beyond his control. On the other hand, if all the calculations be performed under his direct supervision, he may be puzzled by the remarkable differences in the results given by various formulas, none of which do more than to afford what Rankine calls "roughly approximate" expressions for experimental results.

In consequence of the embarrassingly varied estimates of strength furnished by the formulas in general use, ordinary people are content to adopt some simple rule, and to rely with unquestioning faith upon the approximations thereby obtained. Others who aspire to greater accuracy employ more scientific formulas as they stand, or as qualified by practical experience. Thus divergencies are perpetuated and will inevitably continue until rules in which empirical factors are predominant shall be displaced in favour of a formula based upon a logical and consistent theory, covering the varied conditions encountered in practice. A praiseworthy attempt in this direction has been made in a paper on "The Practical Column under Central or Eccentric Loads," read last year by Mr. J. M. Moncrieff, M.Inst.C.E., before the American Society of Civil Engineers. In developing his theory and the resulting formula, the author aims at correctness of form without unnecessary mathematical refinements. He maintains that the theory ought to show agreement with, and be a reasonable explanation of, experimental results, and that the formula should have a wide range of application, and be free from empirical factors as far as possible. The reasoning adopted is strictly logical, but nowhere involves the use of the higher branches of mathematics, and consequently is within the comprehension of all. This treatment is entirely to be commended, and may be probably attributed to the fact that the author, as a practising engineer, has learnt the lesson that unnecessary complexity is a thing always to be avoided. The underlying principles of the reasoning are "that a perfectly centred column of perfect material and straightness is an ideal conception seldom or never realised in practice, and that the various influences preventing the realisation can be, as regards their ultimate effect, represented by an equivalent eccentricity of loading." Athough the want of coincidence of the physical axis of resistance and the geometrical axis of the ordinary, or practical, column is known, none of the formulas in common use make the least provision for such eccentricity. Further, very few writers on the subject of column design seem to appreciate the important influence of eccentricity of loading, which may be accidental and small in columns under presumably central loads, or intentional and large in columns under eccentric loads. Most of the columns in buildings are short, and as even loading is quite exceptional, the element of eccentricity is a most important one for the architect. As writers of scientific works ordinarily overlook this essential consideration, it is not unreasonable to suppose that the average architect may do the same, and Mr. Moncrieff has done great service in defining the influence of accidental and known eccentricity, and in furnishing means for determining its effect upon the strength of columns. His theory takes proper account of the "accidental" eccentricity always found in the practical column, and also of the other causes that prevent it from behaving as it would if the materials and workmanship were perfect. Of the latter, mechanical treatment before use, and the process of building up a riveted steel or iron column, have marked effects, in the one case causing internal stresses and qualifying elastic resistance, and in the other producing twisting and curvature, although the column may look straight. As for cast-iron columns, the hidden defects and internal stresses that can never be avoided must inevitably affect strength to a serious extent. All disturbing influences, of which these are examples, are considered by Mr. Moncrieff as being equivalent to actual eccentricity, and are termed "equivalent" eccentricity. Assuming this theory to be true, it becomes evident that if all the elements of error be covered by one factor, the resulting formula should apply to the ideal column when the factor in question is reduced to zero.

In his discussion of theoretical principles, the author commences by considering the stress diagram and resulting deflection of a beam, as involving principles equally applicable to the case of a round-ended column under eccentric load, and leads up by easy steps to a general equation for deflection. An inspection of this formula shows that if ideal conditions were assumed, the corresponding adjustment of values would reduce the equation to a form which, by transposition, gives the ultimate load of the ideal column, $P = \pi^2 EI \div l^2$. This is at once recognisable as Euler's formula, of which the purely theoretical accuracy is unquestioned. Hence, the author's formula appears to be based on correct principles and to be in correct form. Another matter considered is the influence exercised on the deflection, and therefore on the strength, of a column by a small amount of initial curvature. Curvature may be positive, acting with eccentricity to increase deflection; or

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negative, acting against eccentricity, to decrease deflection, and a consideration of its effects will explain why two columns of identical material and dimensions, but in one of which there is slight positive curvature, and in the other slight negative curvature, may afford extremely divergent results when tested. The curvature may be difficult of detection, or it may be absolutely hidden if applying to the physical axis of a column whose outward form is perfectly straight. We are now able to see why the author considers it appropriate to include in one factor accidental eccentricity and other influences which are practically equivalent to eccentricity. In his formula expressing the maximum stress in a column under presumably central load, there is only one empirical factor, including accidental and equivalent eccentricity and a term representing the influence of sectional form. The latter could be calculated for any given section, but as the influence of form of section has not yet been precisely verified by experiment the term is at present treated as a constant. As the formula is given, it is suitable for determining the value of the recognised ratio, $l \div r$, corresponding to a given direct load per square inch of section in a round-ended column. When used for fixed-ended columns the results must be doubled, as such columns may have twice the length of round-ended columns with equal safety; and when used for columns with flat ends, not absolutely fixed, the results may be doubled up to a certain point, beyond which a special modification of the rule is necessary.

Attention may now advantageously be directed to the ancient and oft-repeated error that columns with flat ends are three times as strong as similar columns with rounded ends. Sometimes the error is mitigated by a reduction of the multiple to 2, and at others aggravated by its increase to 4, but it cannot be too emphatically stated that no such relations exist between fixed-ended columns as a class and round-ended columns as a class. Very short columns yield by crushing under direct compression; hence at the ratio, $l \div r = 0$, assuming such a state to be possible, two columns, one with fixed ends and the other with round ends, but otherwise identical, must be of equal strength. As the proportion of l to r increases, deflection becomes a factor for consideration, and the columns fail partly by crushing and partly by flexure. The condition of the ends has an influence upon the amount of the stresses set up, which increases in value with the ratio $l \div r$, and divergence of behaviour between the two types of columns becomes evident, a condition that is accentuated when compression ceases to be the controlling factor. Therefore, while starting at equality, the relative strengths of the two columns vary with every increment of the ratio, $l \div r$, until in exceedingly long columns the type with fixed ends might not fail before three or more times the load had been imposed that would suffice to cause failure of the round-ended type. But it is misleading and highly undesirable to say that one class has two, three, or four times the strength of the other, especially as at the ratio, $l \div r = 60$ — by no means unusual in building construction — the relative strengths of fixed and round-ended columns of wrought iron and steel are approximately as 1.2 is to 1. As for cast iron, no tests of its commoner qualities have been made from which definite comparisons can be drawn, but it would not be safe to accept a higher proportion for cast iron than for wrought iron and steel. Hodgkinson's experiments only provide material for the comparative examination of round and flat-ended columns of Lowmoor iron, and they are not applicable to ordinary qualities.

Examination of the numerous diagrams in Mr. Moncrieff's paper will demonstrate the absolute inaccuracy of the assumption to which the foregoing remarks apply. Another point seldom made clear is the difference between columns with "fixed" and "flat" ends. Scientific writers frequently treat the terms as synonymous, and none of the rules in common use provide for the difference of behaviour that undoubtedly exists. The stress diagram of a fixed-ended column under load includes three figures, one for each end and one for the central portion between the points of contrary flexure. Mr. Moncrieff demonstrates that the central portion is equal to one-half of the total length, thus showing why a column with fixed ends may have double the length of one with round ends for the same load—quite a different thing from saying that it has double the strength. It is clear that tensile stress may be developed at the ends of a fixed-ended column, but none can be set up at the unfixed ends of a flat-ended column. Up to the point at which the load would tend to set up tension a flat-ended column will act as one with fixed ends, but when that point is passed it will begin to rotate on its bearing surfaces and will be in a highly unstable condition, when a small increase of load would probably cause failure. The condition is described by the author as due to "incipient tension," and is to be determined by a modification of his formula. This part of his paper deserves careful study, as it certainly embodies the first attempt to arrive at a rational basis for the strength of flat-ended, as distinguished from fixed-ended, columns. A strictly practical matter treated in the same section of his essay is the rarity of absolute fixation even in columns with presumably fixed ends. The ends may be securely connected to some other parts of a structure, but this in no way ensures the conditions which make it safe to calculate strength by any formula based upon the assumption that the ends are absolutely fixed. In building construction the objection seldom applies, because most of the columns used are well below the ratios at which divergence of behaviour becomes manifest.

As the starting point for the theory and formula was the development of an expression for the deflection of a column, it is important to see whether the deflection formula shows agreement with the results afforded by tests. This condition is demonstrated to be reasonably fulfilled in the next section of the paper, and a lengthy comparison is then instituted between the calculated and actual strengths of columns of various materials and forms, the calculations being made by the author's formula or modifications thereof, whilst actual strengths are furnished by nearly all the trustworthy results that have been published since the time of Hodgkinson. All these results, to the number of 1,620, representing 1,789 tests, are plotted in terms of $l \div r$, so that they may be readily compared with the calculated curves of strength. Considerable variations appear for the same materials, and actual column strength is therefore suggested by a broad curved band rather than by a geometrical curved line. Consequently, Mr. Moncrieff has adopted the convenient course of assigning values for the factor representing eccentricity and other disturbing influences approximately corresponding (a) with the highest results and (b) with the lowest results. Two calculated curves are thus obtained for each diagram, representing the upper and lower limits of strength, and between these the ultimate strength of an average column will lie. The comparison, extending to twenty-nine diagrams of results, is quite sufficient to support the author's contention that his formula is both rational and in fair agreement with the most reliable records. It also throws light on other points. For instance, apart from Hodgkinson's tests of Lowmoor iron, which cannot be taken as applying to common qualities, there are no published records of tests of cast-iron columns made in a consistent and scientific manner, and the only other records as to cast-iron really afford no sufficient justification for the formulas in general use. Again, numerous diagrams illustrative of tests by Mr. Christie, Professor Tetmajer, Mr. Marshall, and others on flat-ended wrought-iron and steel columns tend to confirm the general accuracy of the author's theory as to "incipient tension." In his experiments on wrought-iron flat-ended struts Mr. Christie found failure by rotation at the ends frequent in the longest struts and invariably absent in the shortest. The note should also be made that some of the pin-ended columns included in the diagram actually failed by deflection in a direction parallel to the pins, thus showing that they really acted as flat-ended and not as pin-ended columns. Although this result merely suggests that the columns were of less strength in a direction parallel to the axis of the pins than in a direction perpendicular to them, it serves to indicate the necessity for great care in the design of columns where such conditions may be existent. Very few records are available with regard to eccentrically loaded columns, and this accounts for the limited extent of the comparison so far as concerns intentionally eccentric loads.

In applying Mr. Moncrieff's rules in ordinary practice, they can be used, as in the comparative investigation to which we have alluded, to indicate the ultimate strength of various types of columns. This course is not advised by the author, who thinks it better to design columns "so as to ensure that given maximum fibre stresses will not be exceeded under the working load," and at the same time he considers it necessary to provide against failure by instability in the longer lengths. The first condition is readily ensured by adopting suitable values for the physical constants, and in assigning a value for the factor representing accidental and equivalent eccentricity that is in accordance with the diagrams of experimental results. The second condition is attained by qualifying the value of E, the modulus of elasticity, by a factor of safety, which has little influence on short columns, but whose effect increases gradually with the length, ultimately affording a factor of safety of

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3 against instability in exceedingly long columns. Writers on the subject of columns generally treat stiffness in conjunction with strength, apparently considering that these two properties are too much dependent on each other to be separated. Mr. Moncrieff follows a much more correct course in demonstrating that two independent modes of failure have to be provided against: (1) by excess of stress intensity, and (2) by instability. To show the logical nature of this argument, he gives a diagram containing two curves, one dealing with working loads on mild steel columns, as limited by safe stress intensity, and the other ensuring that the working loads shall not cause instability. The first of the curves is calculated by the ordinary form of the author's equation, and the second by what is practically Euler's formula with the addition of a coefficient of safety. By the curves it becomes clear that above and below the point where $l \div r = 88$, the loads indicated by the stress curve would inadequately provide for stability, and obversely, that the loads shown by the stability curve would not sufficiently provide for strength. Whilst the rules by which the two curves are calculated demonstrate the independent character of both strength and stiffness, there are practical and other reasons why one equation only should be adopted in ordinary use. Such an equation is afforded by the author's formula when the factor of safety against instability has been included. The formula is then applicable to columns of various classes and materials, under either "central" or eccentric loads, convenience and simplicity being attained by the tabulation of working equations. Taking those for mild steel under "central" loadings, as examples, we have for round-ended columns:—

$$\frac{l}{r} = 10\sqrt{\frac{480}{12 - 4.4 f_d}\left(\frac{2.4}{f_d}\right) - 1.6}\,;$$ for fixed-ended columns double the results thus obtained; and for incipient tension in flat-ended columns, $\frac{l}{r} = 2.138\sqrt{\frac{3{,}000}{f_d}}$.

In all the above working equations the average intended direct load per square inch must be inserted in units of 10,000 lbs. each. We can now see that from these rules a series of curves can easily be calculated, giving as before the ratio of $l + r$, corresponding with any required safe dead load per square inch of column section. When the curves have once been plotted for office use, no further calculations of the same kind are again necessary, and for any given section and length of column two things only have to be done: (1) to divide the length (l) by the radius of gyration (r), and (2) to read off the safe load per square inch corresponding to that value of $l \div r$ indicated by the curve on the diagram.

Intentionally eccentric loads receive far too little attention, even from engineers, whilst it may be questioned whether they are considered in any definite manner by architects. When the loading is purposely eccentric, it is necessary to add the actual measured eccentricity, and the value of the term denoting the influence of sectional form, to the factors already included in the formula for "central" loads. Then the working formulas for mild steel columns of symmetrical section for the following values of accidental, equivalent, and measured eccentricity are:—

Total eccentricity = 2 in.

$$\frac{l}{r} = 10\sqrt{\frac{480}{12 - 3 fd}\left(\frac{2.4}{fd} - 3\right)}$$

Total eccentricity = 4 in.

$$\frac{l}{r} = 10\sqrt{\frac{480}{-12 fd}\left(\frac{2.4}{fd} - 5\right)}$$

Total eccentricity = 6 in.

$$\frac{l}{r} = 10\sqrt{\frac{480}{12 + fd}\left(\frac{2.4}{fd} - 7\right)}$$

Total eccentricity = 8 in.

$$\frac{l}{r} = 10\sqrt{\frac{480}{12 + 3 fd}\left(\frac{2.4}{fd} - 9\right)}$$

By the use of the formula in this manner it becomes a very simple matter to determine the exact effect of any purposely eccentric load on a column. Two or three experimental calculations will at once reveal the startling fact that in columns of ordinary proportions the strength may easily be reduced by 50 per cent. or more by a comparatively small amount of eccentricity of loading. In view of this fact our readers may well join us in wondering that the rules so extensively used for calculating column strength, and the handbooks so largely relied upon for information, should omit to provide for so serious an element of danger or to afford any hint as to its existence. Mr. Moncrieff's elucidation of the subject is therefore of the greatest value, and may suggest to some of our readers the advisability of inquiring whether columns designed merely to carry "central" loads may not sometimes have to withstand unjustifiable stresses by being unconsciously subjected to intentionally eccentric loads.

The last point considered by the author is the influence of side loads in addition to end loads upon columns. The effect of such loading is readily calculable, and the method to be followed is illustrated by Mr. Moncrieff in the form of a direct example, where the side load has the effect of reducing the safe end load by nearly 43 per cent. The proportion will of course vary in different cases, but it is very evident how important it is that accurate calculation should be made whenever a column has to support a load applied in this manner.

The valuable contribution to technical literature which we have briefly noticed is remarkable for the unique collection of diagrams presented, as well as for the lucid and simple demonstration of the theory propounded. Although much has been written in the past on the subject, and although many engineers have devised formulas for estimating the strength of columns, no effort previously made has resulted in a theory so completely covering the varied conditions encountered in practice, or so reasonably interpreting the results afforded by practical experiment.

NOTES.

Housing of the Working Classes. It is quite clear from the debate in the House of Commons on the Housing of the Working Classes question that the Government do not propose any immediate or really any prospective legislation on the question. Dr. Macnamara moved an amendment to the Address, expressing his regret that the Government did not propose to bring forward any measure this Session. The debate which ensued last week went over the old familiar ground, points which have been frequently alluded to in our columns. Sir Dickson Poynder, in the course of the debate, again asked that the period of the repayment of the local loans should be extended. Mr. Long, President of the Local Government Board, in his reply, distinctly refused to entertain this proposal, and he, like the previous speakers, referred to many points which have been over and over again discussed. The whole of the debate was really a waste of time, since it had no practical result whatever, for it was purely of academic interest, and had no more practical value than a discussion at a debating Society. It is obvious that for any progress that may be made with regard to this question we must now depend for some time to come on the local bodies who are entrusted with the carrying out of this matter. It is to be hoped, therefore, that the Local Government Board will keep a strict eye upon the action of these Local Authorities, and will not fail to stimulate them in endeavours to improve the condition of the working classes. In regard to their houses, as we have often said, it is not so much new legislation which is required as the able carrying out of the powers now entrusted to the Local Authorities. We would again refer to the housing of the poor in the rural districts, and express our opinion that the Local Government Board should bring this question to the notice of every Council and every District Council in this kingdom.

Liverpool Cathedral. The last incident in the Liverpool Cathedral discussion—or the last that has come under our notice—has been the publication in the Liverpool *Daily Post* of a letter from the Dean of Ely, who seems to be accepted by the Liverpool Press as an inspired prophet in architecture, though they will not listen to the opinions of the architects of their own city. The Dean of Ely is enthusiastic—he is even poetical—on the subject of the St. James's Mount site, but he objects to the north and south alignment of choir and nave. But what of that? It is easy enough, as he shows, to get over that difficulty; only make one of the short transepts, the eastern one, into the choir, and call the other short transept "the nave;" and then the long arm which should be the nave, and is in the usual architectural proportions of the nave, we will call a transept—and there you are! This ridiculous suggestion, which would destroy the whole architectural meaning of the mediæval type of plan, is solemnly proposed in a long letter in the journal referred to, and illustrated by a ground plan; and a Liverpool architect who wished to reply to it was refused permission to do so. Really the clerical party and the newspapers in Liverpool seem to be fairly off their heads on the subject.

Architectural Astronomers. Since the discovery of the fact that the axial position of many ancient temples was fixed by orientation in reference to the rise either of the sun or of some prominent star, astronomers and those interested in astronomy seem to have been unable to regard them in any other light than as astronomical instruments. Sir Norman Lockyer, in his book on the Egyptian temples, wanted to persuade us that all the architectural glory of these temples, erected

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at an enormous cost, was only for the purpose of observing the day on which the sun rose on the axial line of the temple; and at the Institute of Architects he informed his audience, in the same spirit, that Stonehenge was a temple for observing the length of the year by recording the rising of the sun on the longest day in the year, and that "such temples were erected in the very first blush of civilisation in order that the people should be able to fix the time for performing agricultural operations." Even if primitive man were more stupid than the birds and beasts, and had no sense in himself of the change from winter to spring, and from cold to warm weather, a set of stakes set up would have answered the purpose of observing the sunrise just as well as these enormous stones—or better; and we are disposed to think that prehistoric men had more common sense than some modern *savants*.

Building Contracts.

THERE never could have been any doubt as to the decision to be given in the case of Hobbs *v.* Turner, which was decided by the Court of Appeal last week. It is, however, desirable to refer to it, because of some expressions in the judgment of the Master of the Rolls. The case itself was really a simple one. It arose out of a contract for the erection and completion of a house, and the defendant was the building owner. The contract was in the usual form of the Royal Institute, and contained a clause in regard to provisional sums for work to be performed by special artists or tradesmen. The specification contained the following clause:—"Provide and fix iron balcony railings to design, allow 20*l.* for this, irrespective of carriage, fixing, and profit." The architect selected the plaintiff to supply the ironwork for the balconies, and the builder asked him to send designs to the architect. After the goods were supplied and sent to the builder, the account was sent to him, but subsequently he was told by the architect that the amount should be certified direct to the building owner. The amount itself was only 27*l.* 10*s.*, but this the defendant refused to pay, and when the case came before Mr. Justice Kennedy, judgment was given for the plaintiff. It is difficult to see why the defendant should have supposed he was not liable to pay this sum, and it is not surprising, therefore, that the Court of Appeal gave judgment against him, Lord Justice Matthew remarking that the question was one simply of fact. But in the course of his judgment the Master of the Rolls laid down something in the nature of a principle—namely, that the proper inference to draw from this form of contract was that it was intended that the building owner and not the builder should be the principal, and that the builder, in ordering the work in question, acted as agent to the building owner. It was quite possible for the builder to make himself personally liable to the supplyer of the article if he distinctly stated that he and not the building owner was the principal in the transaction. Every decision on a case of this character must generally depend on the special form of the contract; but we think it may be taken as the result of this decision that in all cases under the form of the Royal Institute a builder, when he orders a special article, does not make himself personally liable, and that the building owner is responsible for the payment. If this be so, this case certainly is a valuable commentary and explanation on this well known form of contract.

The Widening of Piccadilly.

AT the end of last week the works for widening the western end of Piccadilly between Hyde Park Corner and Down-street were begun. The alteration involves the setting back of the Green Park railing, which extended in a curve from the Arch at Constitution Hill to a point opposite Hamilton-place, straightening the curve, and taking from the park (and from the parish of St. Martin-in-the-Fields) a further strip of land measuring 35 ft. wide at its broadest part. The alteration will be completed in the course of the spring, at an estimated cost of 13,536*l.*, as agreed to by the London County Council at their meeting on November 26 last. The railings are to be rebuilt upon a foundation of concrete, and the Piccadilly pathway is to be relaid, in York paving, to a width of 14 ft. We have already commented upon the futility of the scheme, which cannot possibly remedy an evil arising from the block that is due to the crossing traffic north and south, and which, in effect, will but enlarge the extent of the existing area of obstruction. The hindrance is in fact occasioned by the unrelieved endeavours of two lines of traffic to cross one another upon one and the same level, and not by the actual amount of the traffic itself. The traffic demands better direction, and upon two different planes, rather than wider space, for its course.

The Plumbing Trade.

THE Plumbers' Company have drawn up a set of conditions of indenture for apprentices in the plumbing trade, which seems calculated to put education in plumbing on a satisfactory basis. The term is for five years, if apprenticed in London; and the apprentice is bound to learn the trade of a plumber and the art of sanitary plumbing, including all branches of the said trade which require technical knowledge of water fittings and other sanitary appliances, and skill to construct and adjust them so as to prevent the contamination of air or water in dwelling-houses or other buildings by emanations from drains or sewers. He is also to attend the evening classes of such technical institution or trade school as the Master may direct, with the approval of the Plumbers' Apprenticeship Board; and in every year after the first year he is to submit himself for examination in technical knowledge of the trade and in workmanship, in conformity with regulations prescribed by the Plumbers' Apprenticeship Board, acting in conjunction with the Plumbers' Company.

Leakage Electric Currents.

THE paper read by Mr. Wedmore to the Institution of Electrical Engineers this week on "Earth Currents Derived from Distributing Systems" is an able one, whether regarded from the mathematical or the electrical point of view. The author appears to have been one of the earliest to realise that the magnetic disturbances caused by leakage currents from tramway systems give a fairly accurate indication of the magnitude of these currents. He proves that if the whole current returns by the rails, then the magnetic effects would be practically zero, except in the immediate neighbourhood of the rails. It is notorious, however, that the work of magnetic observatories is rendered useless when an electric tramway is laid within a few miles of them, and hence the leakage currents through the earth must be considerable. He quotes a case where from the magnetic data given he calculates the leakage earth current to be 60 amperes—a result which agrees with direct measurements made on electric systems. He considers that the electrolytic damage done by these leakage currents has been grossly exaggerated. We think that it is too early yet to say whether it has or not. It will be extraordinary if these huge leakage currents do not after a few years "eat" away portions of the gas and water mains near the tram lines. We are sorry that Mr. Wedmore barely touched on the leakage currents from lighting systems, as in our opinion they are quite as important and far more insidious than the currents from tramway systems. We are glad he exposed the fallacy of making the pipes in the neighbourhood of the rail negative to the earth. The effect of doing this is to increase the current flowing in the pipes, and as it makes a circuit in the earth round each bad joint, the damage to the pipes will obviously be increased.

Electric Lighting Explosions in the City.

SOME very interesting and instructive evidence was given in the Board of Trade Inquiry last week as to the cause of the explosions in the mains of the Charing Cross and Strand and of the City of London Electric Lighting Companies, which occurred on the 4th and 5th of this month. Several police-constables described the effects of the explosions in the cable vaults, and how the covers of two manholes were forced off and blown into the air. The explosions were caused by the highly inflammable gas given off by the bitumen, in which the cables are laid in the solid system, becoming ignited in one case by a short circuit to earth, in another by a jointer striking a match in the box, and in a third by lowering a lamp into a manhole. No one was seriously hurt, but several of the employés of the Strand Company were overcome by the poisonous fumes from the bituminous gas and had to be taken to the hospital. These accidents prove that there are drawbacks to using an inflammable substance like bitumen, although it is excellent from an electrical and mechanical point of view in which to lay the mains. The evidence completely bears out what we stated last year about the dangers of three-wire direct-current systems when they become very large. The mains superintendent of the City Company said that the Charing Cross Company had interrupted their mains sixty-five times last year and the Post Office underground wires twenty-five times. He mentioned the case of a perfumer's shop in Cheapside, where he found the insulation running off the main owing to an earth current, which almost certainly must have come from the Charing Cross and Strand Company's mains. Those who have inspected the methods of working of direct current stations are familiar with the rough-and-ready methods in vogue of testing for faults. As was stated in evidence, the first suspicion of anything being wrong was the fact that an ammeter was "hard over." This means that thou-

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sands of amperes are burning out a fault or are straying among the buried pipes of the City. We know that this experience does not occur infrequently amongst other direct current companies. We are told that the Strand Company works with a constant "earth" test, but the infinitesimal value of this test is shown by Mr. Wordingham's evidence, and is proved in a communication last year by Mr. Russell to the Institution of Electrical Engineers. As we have stated before, when direct current networks become very large, trouble will ensue, and the companies will be well advised to attack the problem of raising the insulation resistance of their whole system before taking on new consumers.

The Welsbach Incandescent Gaslight Co.

FOR a long time past the exorbitant charge of 7½d. (formerly 1s.) per mantle has been made for Welsbach mantles sold in this country, although mantles of equally good quality have, during the same period, been sold on the Continent for 3d. or less. A very extensive business has been carried on by the English company, which, however, has not proved profitable to the shareholders. By an overwhelming majority the shareholders have now decided to get rid of the present board of directors, and to replace it with a board which will carry on the business upon new lines. It is proposed to write down the capital, which was notoriously excessive, and to reduce the annual expenditure on litigation. A closer connexion will also be made with the gas companies. If the English company is not committed to the purchase of materials from the Austrian company at prices above their market value, there is every reason to believe that with the proposed reforms, including a large reduction in the selling price of mantles, the English company may be converted into a paying concern. In this country about 20 per cent. of the gas-burners in use are incandescent burners, compared with 90 per cent. in some Continental towns. With the advent of cheap mantles there is no doubt that the proportion of incandescent burners employed will increase rapidly, and that the number of mantles required for renewals and for replacing flat flames will necessitate a large increase in the rate of manufacture.

The Architect's Use of Enamelled Tiles.

ON Tuesday evening Mr. Halsey Ricardo gave a lecture at the Society of Arts on the use of enamelled tiles in architecture; a lecture delightful to listen to, and illustrated by a perfect wealth of lantern slides of tile-decorated buildings, chiefly of course Eastern; and though colour was unfortunately wanting, the illustrations at all events stimulated one's colour imagination. Whether this type of architectural decoration will ever be introduced largely in northern cities, as Mr. Ricardo wishes to see it, is rather doubtful. Colour, and the desire for it, go with regions of strong sunshine; it may seem curious that it should be so, and that those living in a dull atmosphere should not rather strive after colour to frighten their buildings; but somehow strong colour seems to lose its effect and to be out of place under dull skies, and we are rather inclined to think that this is an inherent feeling which will not be reasoned down. Nor do we much like the idea of a city architecture of glazed surfaces. Can we not have permanent and washable coloured material without glaze?

The Two Churches at Swaffham.

THE quarterly issue of the *Church Builder* draws attention to the condition of the two churches, that of St. Mary and that of SS. Cyriac and Julitta, which stand close together at Swaffham in Cambridgeshire, sometimes named on this account "Swaffham Two-churches." There were originally two parishes, subsequently consolidated into one. The tower of St. Mary, now half demolished, is or was an octagon on a square ground story, and with a sixteen-sided story and a spire above this; the other tower is square for half its height, but finishes as an octagon. The effect of the two when complete, standing close together, must have been very unusual and picturesque. St. Mary's spire was struck by lightning (the date of the event is not given), a disaster which seems to have been thought at the time a sufficient reason for deserting the church and destroying both buildings. The demolition of St. Mary's, however, was found to be "too great an undertaking," though it was thrown into ruin, and the nave of SS. Cyriac and Julitta was pulled down and eventually a "churchwarden" nave built in its place. This is now to be removed, and the tower left as a campanile, while St. Mary's is in course of restoration for worship, under the care of Sir A. Blomfield & Sons.

The Beaufort Estates, Monmouthshire.

IN the course of next spring a further portion of the Duke of Beaufort's property, including Grosmont, Striguil, and White Castles, and Wentwood (some 2,200 acres of woodland), will be offered for sale. Last autumn the Government purchased, from the estates, a tract of land of 8,500 acres lying between Monmouth and Wynd Cliff, near Chepstow, and adjoining the Forest of Dean, and thus secured the ruins of Tintern Abbey, together with Monmouth Castle. Usk Castle has been bought privately, whilst the Duke will, it is stated, retain Raglan Castle. Up to the close of last year a total area of 23,470 acres was disposed of, with the timber, for 626,000*l.* Grosmont has been identified with Rosslyn Castle, or Rossllwyn, the Castle of the Red Rose, a residence of the Earls and Dukes of Lancaster. White, or rather Llanteilo, Castle, seven miles north from Monmouth, is supposed to have been built *temp.* Stephen, and, together with Grosmont and Skenfrith, was dismantled by order of Edward IV. Chepstow has been identified with the Estrighoiel—since Striguil—of the Domesday Survey, as standing by the Roman *Strata Julia* at its crossing of the Wye, and is one of the largest and most important of the many castles in the Marches. Whilst the fabric presents traces of Roman masonry, it is generally considered that the fortress was established by William Fitz-Osbern, whose son Roger forfeited it in 1078 for rebellion against the King, who bestowed the lordship of Striguil upon the de Clares. Walter de Clare, who founded Tintern in 1131 for some monks from L'Aumone, had acquired all Nether-Gwent, or Monmouthshire, under a licence from the King to become over-lord of whatever lands he wrested from the Welsh. His lands passed to his nephew, Gilbert Fitzgilbert, surnamed Strongbow, whom King Stephen created Earl of Pembroke in 1138. His son Richard Strongbow, had an only child, Isabel, who married William, Earl of Pembroke, whose monument is in the Temple Church, London. Their eldest daughter, Maud, brought Striguil in marriage to Hugh Bigod, Earl of Norfolk, whose descendant, Roger, rebuilt Tintern in 1269. The Bigod lands ultimately devolved upon Sir Charles Somerset, elevated Earl of Worcester in 1514, and ancestor of the ducal house of Beaufort, when he married Elizabeth, daughter and heir of William, Earl of Huntingdon, son of the renowned William, Lord Herbert of Raglan, Chepstow, and Gower, advanced Earl of Pembroke in 1468. The ruins, entered through the great gate-house flanked with two drum-towers of Edward I.'s day, consist of four wards, ranged upon the slope of a lofty limestone rock, guarded by the Wye on the north, and a deep moat. The kitchen, offices, and lesser hall (*temp.* Edward II.), with the tower named after Marten the regicide, in which is the lord's oratory, a beautiful thirteenth-century chamber, are in the first court or lower ward; in the middle ward is the Norman keep, containing much work of the Early English period.

Lecture Diagrams.

WE should like to draw the attention of those who read papers before the Institute of architects, the Architectural Association, and at other similar gatherings, to the importance of having wall diagrams, if necessary for the elucidation of the paper, so drawn that they can really be visible and intelligible to the audience from their seats. Nothing can be more absurd than for a reader of a paper to be constantly referring to diagrams on the walls, and saying "as shown on Sheet A" and so on, when the drawings are really such that no one can see them; but this is a constant experience both at the Institute and at the Association. It is true, a lecturer may line the walls with extra illustrations to give people something further to look at afterwards; but those which he actually uses for reference in the body of the paper ought to be drawn so as to be visible to the audience, otherwise the whole thing is a mockery. Some people seem to think it is quite sufficient to have an illustration on the walls and refer to it, whether their listeners can see it or not. This shows a want of trouble in preparing a paper, and to our thinking a want of respect for their audience. Architects should take example from the way these things are done at the Institution of Civil Engineers. The walls are often covered with diagrams there, but they are always drawn in such a way that every one in the hall can see them.

DISTRICT SURVEYORS' ASSOCIATION.—Mr. Benjamin Tabberer, having served the usual term as President of the London District Surveyors' Association to the great satisfaction of the members, has retired, and the following have been elected as office bearers for the year 1902:—President, Mr. Alfred Williams; Vice-President, Mr. Alex. Payne; Hon. Treasurer, Mr. Henry Lovegrove; Hon. Secretary, Mr. Fred. Waller; and eighteen members forming the Committee.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of the following Sanitary Officers:—Mr. G. T. Billing, Sanitary Inspector in Finsbury; Mr. H. Wilkinson, Sanitary Inspector in Islington; Messrs. A. Taylor, J. W. Whipp, and F. A. Aris, Sanitary Inspectors in Westminster.

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THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, Regent-street, W., Mr. J. Slater, vice-President, occupying the chair.

Mr. Alex. Graham, hon. Secretary, announced with regret the death of Mr. J. L. Hodgson, Associate, who practised as an architect at Lille, France. He also announced the receipt of 5*l.* 5s. from Mr. Sydney Smirk towards the Library Fund, and said that Mr. Smirk had annually contributed that sum for some years, and they would all agree that a vote of thanks was due to this gentleman.

Prizes and Studentships.

The motion having been agreed to,

Mr. Locke, the Secretary, proceeded to read the Deed of Award of Prizes and Studentships for 1901-1902 :—

The Essay Medal and Twenty-five Guineas.—Four essays on the Employment of the Order in Renaissance and Modern Architecture were received for the Silver Medal. The Council regret that they are unable to award the Medal, but they have voted the sum of ten guineas to the author of the essay bearing the motto "Serlio" (Mr. J. J. Waddell).

The Measured Drawings Medal and 10*l.* 10s.—Twelve sets of drawings were sent in, of the several buildings indicated, and under motto, as follows :—1. Ace (Eltham Palace, Eltham, Kent). 2. Aidan (Lindisfarne Priory). 3. Cavendo Tutus (Bolsover Castle). 4. Inca (Houghton Hall, Norfolk). 5. La Oriole (Oriel College, Oxford). 6. Peakite (Bolsover Castle Riding School). 7. Scheherazade (King Henry's Gate, St. Bartholomew's Hospital). 8. Semper Fidelis (Guildhall, Exeter). 9. Strand (St. Mary-le-Strand Church). 10. "Wren" (Emmanuel College Chapel, Cambridge). 11. H in circle (Aston Hall, Warwickshire). 12. Device of Two Lozenges (St. George's Church, Bloomsbury).

The Council have awarded the Silver Medal and Ten Guineas to the delineator of Bolsover Castle, submitted under the motto of "Cavendo Tutus" (Mr. F. W. C. Gregory, Nottingham), and prizes of Five Guineas each to the delineators of Lindisfarne Priory, Houghton Hall, and Aston Hall, Warwickshire, submitted under the respective mottoes of "Aidan" (Mr. R. W. Owen, Liverpool); "Inca" (Mr. S. Towse, Catford), and "H in circle" (Mr. E. F. Reynolds, Notting Hill Gate, W.).

The Soane Medallion and 100*l.*—Sixteen designs for a swimming bath for men were submitted, under the following mottoes :—1. Amphibious ; 2, Balneæ ; 3, Faust ; 4, Hero ; 5, Io ; 6, Iona ; 7, Naiad ; 8, Natator ; 9, Nero ; 10, Phœnix ; 11, Roma ; 12, Silhouette ; 13, Tepidarium ; 14, Ursa Major ; 15, Wyvenhoe ; 16, Zeno.

The Council have awarded the Medallion and (subject to conditions) the sum of 100*l.* to the author of the design bearing the motto of "Iona" (Mr. J. B. Fulton, Glasgow); Medals of Merit to the authors of the designs bearing the mottoes respectively of "Balneæ" (Mr. L. G. Detmar, Sutton) and "Tepidarium" (Mr. Thomas A. Moodie, London) ; and a Certificate of Hon. Mention to the author of the design bearing the motto "Io" (Mr. E. Vincent Harris, London).

The Owen Jones Studentship and 100*l.*—Seven applications were received for the Owen Jones Studentship from the following gentlemen :—1. Edward H. Bennett ; 2. Cecil Scott Burgess ; 3. V. J. Cummings ; 4. L. Rome Guthrie ; 5. James McLachlan ; 6. Percy E. Nobbs ; 7. Ramsay Traquair.

The Council have awarded the Certificate and the sum of 100*l.* to Mr. Edward H. Bennett, Paris ; a prize of 10*l.* 10s. to Mr. Percy Erskine Nobbs, M.A.Edin., Chelsea ; and a prize of 5*l.* 5s. to Mr. James McLachlan, Edinburgh.

The Pugin Studentship and 40*l.*—Twelve applications were received for the Pugin Studentship from the following gentlemen :—1. George A. Bachmann ; 2. Heaton Comyn ; 3. P. Ion Elton ; 4. J. W. Farmer ; 5 J. Harold Gibbons ; 6. W. S. A. Gordon ; 7. Stanley H. Hamp ; 8. A. Muir ; 9. J. B. Pye ; 10. J. Myrtle Smith ; 11. C. Wontner Smith ; 12. P. J. Westwood.

The Council have awarded the Medal and a sum of 40*l.* to Mr. Cyril Wontner Smith, Finchley ; Prizes of Five Guineas each to Mr. Andrew Muir, Hammersmith, and Mr. J. Myrtle Smith, London ; and a Certificate of Honourable Mention to Mr. J. H. Gibbons, Manchester.

The Godwin Medal and 40*l.*—Two applications were received for the Godwin Bursary from the following gentlemen :—

1. Henry L. Merille de Colleville.
2. Charles A. Daubney.

The Council have awarded the medal and the sum of 40*l.* to Mr. C. A. Daubney, Peckham.

The Tite Certificate and 30*l.*—Twenty-four designs for a Royal Memorial Chapel in the Italian style were submitted under the following mottoes :—1. "Archivolt" ; 2. Avanti Savoia ; 3. Bramante da Urbino ; 4. "Duomo" ; 5. Gibbs ; 6. Issius ; 7. "In Memoriam" ; 8. "John-o'-Gaunt" ; 9. Lion Heart ; 10. Marble ; 11. Moab ; 12. Nero ; 13. Nimrod ; 14. "Pax" ; 15. Petronius ; 16. Rex on grey strainers ; 17. Rex on brown strainers ; 18. R.I.P. on 3 strainers ; 19. R.I.P. on 5 strainers ; 20. Tendimus ; 21. Device of a Shamrock ; 22. Device of a Circle ; 23. Device of a Blue Cross ; 24. Device of 3 Red Seals.

The Council have awarded the Certificate, and a sum of 30*l.* to the author of the design bearing the motto "Lion Heart" (Mr. C. Gascoyne, Nottingham) ; a Medal of Merit to the author of the design bearing the motto "In Memoriam" (Mr. Andrew Hutton, Dundee), and a Certificate of Honourable Mention to the authors of the designs bearing the mottoes "Marble" (Mr. W. Curtis Green, London) ; "Rex on Grey Strainers" (Mr. Arthur R. Gough, Bristol) ; and "Shamrock" (Mr. C. E. Power, London).

The Grissell Medal and 10*l.* 10s.—Six designs for a Timber Footbridge across a Stream were submitted under following mottoes :—1, Cædmon ; 2, Groined Barrel ; 3, Hertford ; 4, Rover ; 5, Toby ; 6, Red Trefoil.

The Council have awarded the Medal and 10*l.* 10s. to the author of the design bearing the motto "Toby" (Mr. L. Upperton Grace, Regent's Park).

The Ashpitel Prize, 1901.—The Council have, on the recommendation of the Board of Examiners (Architecture), awarded the Ashpitel Prize (which is a prize of books value 10*l.*, awarded to the candidate who has most highly distinguished himself among the candidates in the Final Examinations of the year) to Mr. C. Thomas Adshead, of Liverpool.

The Council have further awarded a prize of books to the value of 10*l.* to Mr. Frederick Dare Clapham, in recognition of the merit displayed by him in his work at the Special Examination, June, 1901.

The Travelling Students' Work.

Owen Jones Studentship, 1900.—The Council have approved the drawings and design executed by Mr. George Andrew Paterson, who was awarded the Owen Jones Studentship for 1900, and who travelled in France, Italy, and Spain.

Godwin Bursary, 1900.—The Council have approved the Report of Mr. Sidney Kyffin Greenslade, who was awarded the Godwin Bursary in 1900, and who visited the United States of America to study the Planning and Construction of Public Libraries. The Council have awarded Mr. Greenslade an extra grant of 20*l.* to enable him to continue his studies.

Pugin Studentship, 1901.—The Council have approved the work of Mr. Henry William Cotman, who was elected Pugin Student for 1901, and who travelled in Wiltshire, Somersetshire, Dorsetshire, Gloucestershire, Warwickshire, and Oxfordshire.

Stonehenge.

Mr. Detmar J. Blow then read a paper on "The Architectural Discoveries of 1901 at Stonehenge," and first dealt with the archæological investigations of the place in 1600 by one of the greatest masters of our art, although without any really satisfactory result. He meant the investigation by Inigo Jones, whose valuable "Discourse on Stonehenge Restored" was drawn up by direction of King James I. in the year 1620. After much reasoning, and quoting a long series of authorities, Inigo Jones concluded that at least this ancient and stupendous pile must have been originally a Roman temple inscribed to Cœlus, the senior of the heathen gods, and built after the Tuscan order. This notion was, however, warmly attacked by Dr. Walter Charleton in the treatise called "Chorea Gigantuam," which was published in 1663, and in this the Doctor is very positive that this extraordinary monument was erected by the Danes, and he caused a copy of Inigo Jones's discourse to be transmitted to Oleus Wormus, the celebrated antiquary of Denmark. From the argument which followed, the Doctor drew up his treatise, in which he mentions that this "ruinous fabric" was in reality of Danish origin. The world, however, did not generally come to the Doctor's sentiments, although Sir W. Dugdale is said to have approved of them, and Mr. Dryden wrote an eloquent panegyric to the author upon his performance. This raised a controversy, and gave occasion to Mr. J. Webb, to whom we owe the original publication of Inigo Jones, to give what he calls a "Vindication of the Stonehenge Mystery." Mr. Samus, in his "Britannica," had it that Stonehenge was Phœnecian, and Mr. Aubrey thinks it was British ; and yet, if the true writing of the name be "Stanhengest," Bishop Nicholson says he could not see why the Saxons might not have as just a title as any to the honour of it. Mr. Stukely says that if Stonehenge was of Roman work, it would certainly have been built at the Roman scale, and had Inigo Jones reduced his own measures to that standard, he would have seen the absurdity of his opinion. When Stukely examined the dimensions of Stonehenge he found, as he surmised, that they are all fractions in the Roman scale—undoubted evidence that the Romans had no hand in building it. Stukely says they are stones of different diameters upon elevated ground, and are generally stones taken from the surface of the ground. The monument has stood there and seen the rise and fall of more than one civilisation—sometimes the object of archæological inquiry, and at other times lost and forgotten, for in the Roman occupation it is not recorded. The great monolith called the leaning stone was the largest in England, Cleopatra's needle excepted. It was one of the pillars of the highest trilithon, and stood behind the altar stone, near which it leaned at an angle of 65 degs. Half way up it had a fracture one-third across it, and the weight of stone above that fracture was a dangerous strain upon it. It had now been brought to a vertical position. One Roman coin and one George III. were found quite near the surface. Numerous chippings of the sarsen and blue stone, of which Stonehenge was built, were discovered. The flints found were used for the softer sarsen and blue stones, and the hand hammers and mauls for rough dressing. From this the deduction had been made that the building belonged to the Palæolithic period. All authorities agreed that it was the work of a highly-civilised people. The construction was one of a stone development, and the surface of the stone was finished much like that of granite. The design of the pillars was, in his opinion, evolved from the shapes of the flint instruments used by the workman, to which his hand had grown accustomed. Each pillar had a bold entasis in its elevation and in its plan foreshadowed the column. With the aid of the illustrations he described the method of raising the leaning stone and the sifting process, the articles found being afterwards shown to the audience. Stonehenge having been generally supposed to be of the bronze age, it was with great joy that he lighted upon the stone implements. It was, he believed, the only occasion on which the implements were found actually next to the stone building where they were used. The British Association had formed a committee for investigating the stone circles over the country. Excavations are being made at Aberlow, and it is possible it may be found to be only rougher monuments earlier or later to the Stonehenge period.

The Chairman said he was sure they had listened with great interest to the description which Mr. Blow had given of the way in which the stone was raised up, for there was no possible way of showing it so well as by the illustrations they had had. He had rather hoped they would have had a little more information about Stonehenge itself, but perhaps they would get it from some of the gentlemen there that night, who, he knew, had paid great attention to the subject. He would ask Sir Norman Lockyer, who had made a great study of the subject, to say something about it.

Sir Norman Lockyer said he need not say how extremely important these researches which Mr. Blow had described were to any one who studied Stonehenge, and any ancient monuments which might be approximately of the age of Stonehenge, for the reason that he believed that archæologists had quite come to the conclusion that from the evidence which

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had been obtained alone by the means which Mr. Blow had brought before them, they were justified in assuming that the sarsen slabs were erected in Paleolithic times—that was to say, before the age of bronze, or, at all events, before bronze had been used for any ordinary kind of work in that part of England. While this work had been going on—in fact, slightly before the work was commenced, Mr. Penrose and himself had been occupying themselves with Stonehenge from a slightly different point of view. They were very anxious, if possible, to determine its age, because very much depended upon it. First of all, Stonehenge was an ancient stone, but lent itself better to astronomical work than Aberlow, Stanton Drew, and the stone circles near Keswick and in other parts of England. It was much more difficult to get certain data from these ancient monuments than in the case of Stonehenge, for the reason that Stonehenge itself was on high ground, and the horizon around it in all directions is brought nearly to the same height. This was important from an astronomical point of view, and the task of observation was made quite simple at Stonehenge; and if it was necessary to find the point of time it would be more easy to do it than by tackling any of the other ancient monuments to which he had referred. In orientation generally, as they had dealt with it in Egypt and Greece, the question was the change of position—in the axis of the temple or the laying down of the axis of the temple or a church by means of observations of stars. But, fortunately for them, as archæologists and not as astronomers, the movements of these stars were very considerable, so that if a temple was pointed to a star one year, in 200 or 300 years it no longer pointed to the same star, but to another one. That, of course, applied to temples the erection of which had been determined in the first instance by observations of stars, but that, unfortunately, could not apply to Stonehenge, because it had been well understood, and acted upon ever since they could remember, that the people of Salisbury and the surrounding places went to observe the sun rise on the longest day of the year at Stonehenge, and they were justified in assuming that it was a temple used for the observation of the height of midsummer. Some other principle than stars had to be adopted, and that was to point the temple directly to the point of the horizon at which the sun rose on that particular day of the year and no other. And here a very important point came in—it was the point of the year; the day of the year most easy to take by astronomical observation, because all they had to do was to observe the sun climb the sky at noon and set more and more north as summer came along until at the height of summer they had the extreme north-easterly point of the horizon reached and the sun stands still. All they had to do was to put a lot of sticks up, and they had their line, and even after that they would find that the sun came back to the same place. When they had once got their alignment for the rise of the sun, they could determine absolutely the length of the year and the beginning of each year as it came along. Now if there were no change in the position of the sun, of course that would go on for ever and ever, but fortunately for archæologists there was a slight change in the position of the sun—the planes of the ecliptic and the planes of the equator having a slight change in the angle between them. So far as they knew it had been gradually reducing this angle for many thousands of years, and so in the case of Stonehenge, if one wished to determine the date one had no stars to help one, and the only thing one could hope to get any information from whatever was the very slight change of this angle between the plane of the ecliptic and the plane of the equator; and that was the special point which Mr. Penrose and himself set out to do at Stonehenge, because, for the reasons he had already set out, they considered they were in a position to do it more conveniently from there than anywhere else in the country. Well, they made their observations and came to the conclusion that the avenue which was associated with the sarsen stones was laid down about the year 1680 B.C. They considered that it was impossible to fix the date nearer than 200 years, for the reason that the change to which he had referred in the ecliptic varied very slightly. Their ancestors—he supposed they were their ancestors—who were engaged in the erection of these works had been very much misrepresented and were held to be entirely in the wrong by some people who had not found out what they were really driving at. It was absolutely essential for the inhabitants of Britain as it was then, townless and almost uncivilised, that they should know something about the proper time for performing their agricultural operations. Now they could go into shops and buy an almanack which would give them everything they wanted to know about the year and month and the day, and that was the reason why so few cared about astronomy. But these poor people in those days, unless they found out the time of the year and the month, had absolutely no means of knowing when their various agricultural operations should take place, and so they found all over the world such temples as Stonehenge were erected in the very first blush of civilisation in every part of the world they enquired into. On that a point came in of very considerable interest, with special reference to Stonehenge. If they took the civilisation of Egypt, they found, as far as they knew, that the first people who used this principle of orientation for agricultural purposes were some tribe or other who came down the Nile 7,000 years B.C. After that they found the next race, instead of being interested in sowing and therefore interested in agriculture, were interested in the year about the time of Easter, which was the August festival of a large part of Egypt. This race built the Pyramids 4,000 years B.C. Then came another race which started Solstitial worship—the worship of the sun at midsummer. They must not forget that not long before that farmers tried to sow by the moon. Not only was that method employed for centuries, but it fixed the unit of time even of human life, and they knew now that when men were said to have lived their 1,200 years, it meant 1,200 months. When they looked back in the history of their own country and came to Britain—leaving alone Greece and Rome—they found that at various times in their country they had the farmers' year beginning in the month of May, another farmers' year beginning in the month of August, and another year beginning at the longest day, and it appeared that the year which began at the longest day was really the last one to be introduced. So they would see that although Mr. Penrose and himself had been able to show, he thought, beyond all doubt that they had in Stonehenge a Solstitian temple for observing the length of the year by observing the rise of the sun on the longest day of the year, yet in other parts of England there were other temples for observing the sun, not on June 21, but early in May and early in August, and it was quite possible at some future time, when Mr. Penrose and himself considered other stones, they might find that Stonehenge had something to tell them on that point also.

Mr. F. C. Penrose said he observed that the avenue at Stonehenge, which gave them a clue, was exactly a counterpart to the line of sphinxes which led to many of the Egyptian temples. It was impossible to consider the matter of Stonehenge without having extreme veneration for the monument, and he was rejoiced that so much attention was now being paid to it, and that the repair of the temple had been begun in a sound and legitimate sense by raising the leaning stone from a position of danger. Perhaps they might hope that the trilithon which fell down about a year ago might be put back into its position. He gathered from Mr. Gowland, that he derived from the appearance of the tools, that about 200 years B.C. was about the probable date, and that was within their estimate. They had many tools in the room that night, and they would notice that many of them had been worn with the work. He would like to ask just one question. He understood that fragments both of sarsen and blue stone were found in the excavations. He would like to know whether the chippings of sarsen were in much greater abundance than those of the blue stone.

Mr. Blow: I think that was the case.

Mr. Penrose said it was possible that the blue stones might have been altered in their position when the sarsen stones were put up, although it was by no means certain that that was so. The quantity of the chippings of the two materials might have some bearing on the question.

Mr. Emmanuel Green remarked that very much had been said, and Sir Norman Lockyer and Mr. Penrose had come forward with their theories, and probably they might be right, but, without any offence, he hoped they would not allow their authority to influence their opinions too much and prevent further investigation. There was no doubt that local men went round on June 21, and that the sun came upon that morning where they expected it to come, and following that matter, they might follow up the matter of ordinary worship. There was a little point which had not been mentioned. No doubt the idea arose when the sun almanack started, but it had not been noted that there were thirty stones in the outer circle at Stonehenge, and they would see that if services were held at the different stones every day of the month they would get their month each time they went round the circle. There was a thirty-first stone by which the thing was made to tally and come right. The attitude for the archæologist, he thought, was that if they found something of which they did not know its use, they asked themselves the question whether there was not a thing exactly like it elsewhere, and if they found it was so they at once concluded they had something which in its turn served that same purpose. It was a rather curious thing that in the book, "The Earl and the Doctor," the late Earl of Pembroke noticed very plainly and clearly a similar kind of thing in the Pacific islands. He noticed that when a man got old and dirty and poor he set himself up as a priest, retired to a hut on high ground, and got stones set up exactly as at Stonehenge, and there he sat to receive cowrie shells from those who went to him. That was a remarkable and curious thing, but there was another thing connected with it which had never been noticed in Stonehenge—that the spaces between the stones were filled up with rubble. In the case of Stonehenge that was gone. There were in Scotland to-day still buildings where there were large stones for the uprights and doors and sills, and the spaces between were filled up with rubble. That was a little point which had not been noticed. Then on the question of moving the stones, the plan shown of the way it was done in Japan was, no doubt, an early one; but in India they could see to-day large stones moved in a manner which would recommend itself very much to them. The stone was placed on rollers such as they would see being used for moving an iron safe into a house. Some 200 men were harnessed to the stone, and the rollers were placed in front and the stone moved slowly along. Another thing they would like to hear something about was as to where the stones at Stonehenge came from. It was a question of geology, and the investigations of local men were such that they might fairly consider that the stones were there. There were Sarsen stones there to-day, and Sarsen stone was being broken up to-day. As to how they were deposited there, that they must leave to geologists to determine. It had always been an enormous puzzle how they were erected, and he thought that still wanted a little investigation. On the top of the columns there was a tenon, and the stone laid across was hollowed, and it was very difficult to understand how that was done. The stone and flint business did not at all explain that. He thought that with regard to the question of the date, they must await a little further investigation. Mr. Storey Maskelyne had given great attention to this thing, and worked very hard on it, and had given his figures and all his reasons, as a good scientific man always did, and he concluded that the date was 2900 B.C. They got here a difference of 1000 years, and yet the arguments given were equally clear and equally apparent, and under those circumstances the more evidence they got and the more arguments they obtained, and the more attention which would consequently be given to the subject would possibly tend by degrees to get rid of what was not true and gradually reduce the range of time.

Mr. St. John Hope said he could not claim to have made the question a study, but he had been struck with a astonishment at the stupendous character of the work itself and wondered how it was made, and he would like to ask a number of questions. He had tried to get an answer to those questions by reading a great deal of the vast quantity of matter which had been written round about Stonehenge, but there were so many theories put forward by different writers that one left off in the same state of not knowing anything with which one started. The investigations which had just been made at Stonehenge had shown the enormous value of investigations by means of pick and spade.

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For a very long period men had been wasting time and their brains in putting forth their theories on paper, all to no purpose; but here in one little excavation within a short space of time a very great deal had been set absolutely at rest. To begin with, it was quite clear from the materials which had been brought to them that night, that they could get some indication as to date. He was sorry Mr. Gowland was not there to tell all the little details about the discoveries of the things which had been shown and the facts which he had adduced from them; but as regarded the date, Mr. Gowland argued that there could be no doubt whatever that these various tools, both the small hammers and the flint instruments used for dressing the harder stones, belonged to the period of transition from the Stone Age to the Bronze Age. Mr. Gowland did not dispute, so far as he could learn, the fact that this monument might even belong to the early Bronze Age; but he said they could satisfactorily account for the absence of bronze tools, for the simple reason that bronze tools would be absolutely useless to work the stone of Stonehenge. It would have no effect on sarsen and the still harder blue stone, although it was possible that further investigations might bring to light some bronze things which had been dropped and tools which had been used in building Stonehenge. They would see what a very small area had already been attacked in the way of scientific excavation, and if that very small area brought to light so much, it was very likely something more would come to light when these investigations were extended further, as they probably would be. At present antiquarians were not agreed as to what the date should exactly be. Some of the antiquarians took it as far back as Mr. Gowland was inclined to put it, and others to a later date. But they were working from two different points of research—the evidence of tools and astronomical data, and if they took the two they got what appeared to be an average mean. Those excavations had raised another point. People had put forward theories about Stonehenge being the work of different times or of one time. Antiquarians argued that the blue stones were in position first, and that the others were added, because the blue stone was of a very sacred character. Others had stated the contrary. Those excavations had decidedly shown the fact that the whole monument was one erection. In every one of those excavations the blue stone chippings and the sarsen chippings had been found mixed up together, and at all depths, and he thought that proved the fact beyond all doubt. The preponderance of blue stone chippings over the sarsen chippings was explained on the ground that as the sarsen stones were much greater in bulk, they must have been partially dressed where they were found before they were brought to the side of the monument. Then some interesting evidence came to light as to the way in which Stonehenge was built. It was argued that the great stones were got into position by sinking a hole, into which the stone was finally to go, and then cutting away one side to form an inclined plane, so that the stone would slip into the hole, and would be partially brought up to a sloping position, and then be levered up, and by degrees got into a vertical position. That was easy if they were given unlimited labour. But there came the question as to how the lintels were put up. In conversation with Mr. Gowland he suggested a way which was ingenious, and one could see how possibly it had been done. Mr. Gowland argued that just in the same way that people began to build a house in Japan, by building the roof first and then the house underneath; so they put up these great stones, lifting the great lintel by packing until they got it into its right position. There was one point he would like to ask a question upon. In a paper read very recently before the Royal Society on the question of the orientation of Stonehenge, it was said there could be no doubt whatever that Stonehenge was roofed in, and he would like to know how Stonehenge could have been roofed in. Looking at it from purely a layman's point of view, he could not imagine how this could have been done. There were certainly no marks on any of the existing stones, and there were no signs of a filling in between the uprights with rubble. The only way he could imagine it might have been roofed in was by a roof of skins.

Mr. Penrose said there were two or three questions he would like to ask. He understood that the chippings of blue stone were less than of the sarsen.

Mr. Blow said that was so because the places which were excavated were at the sarsen stones, and they naturally found many more chippings there than of blue stone.

Mr. Penrose said that with regard to the point raised respecting the roofing in, his impression was that the place was covered in with flat logs of wood, which could easily have been placed there so that a dark sanctuary was obtained. With regard to the lifting of the stone, he did not think that there need be much question, as much higher stones than even the great lintel at Stonehenge, or even than the great standard itself, were lifted up in early days.

The Chairman remarked that he was quite sure it was only necessary for him to say how exceedingly interesting that evening had been. He thought Mr. Blow was to be congratulated on the work he had done at Stonehenge, and he was sure the country was to be congratulated on having somebody to superintend that work, who had taken the religious care he had in doing it. The scrupulous care with which he had taken up the ground, and taken care of every piece and implement found, showed that the monument could not be in better hands. The astronomical details given by Sir Norman Lockyer were very interesting, but he was afraid they were rather too abstruse for some of them to follow. He was sure that Sir Norman, if he had been asked, would have had great pleasure in proposing a vote of thanks to Mr. Blow that evening, but as he had not done so he (the Chairman) would move such a vote.

The resolution was carried with acclamation.

Mr. Blow, in reply, said that with regard to the preponderance of any one kind of chippings, they found evidence from the excavations made that the whole place must have been a mason's yard, but what they had come upon was not sufficient to go on as to what would be the case over the whole site. With regard to the orientation of the place he would like to hear more about that as time went on. There had really been no good reason put forth for the curious way in which chancels of churches did lean to the south very often, and it might be investigated further. With regard to the lintels, that had been answered by Mr. Penrose, but it had struck him that there were plenty of ways of doing that. As the trilithons were greater at the west than the east it suggested the flow of water from the west to the east.

The Chairman announced that Mr. Emerson, the President, found it impossible to get back to the next meeting on February 3, when the presentation of prizes to the students would take place.

THE ARCHITECTURAL ASSOCIATION:

THE usual fortnightly meeting of the Architectural Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Mr. W. H. Seth-Smith, President, in the chair.

The minutes having been read and confirmed, the following gentlemen were elected members of the Association, *i.e.*, Messrs. E. J. Harbottle, R. Hebert, J. R. Hobson, L. de B. Kilsey, E. P. Lee, A. G. MacNaughton, H. A. Porter, and W. S. Read.

New Premises Fund.

The Chairman announced the following additions to the fund for the provision of new premises, viz.:—Messrs. R. L. Curtis, 105*l.*; John Leaning, 10*l.* 10s.; H. J. Leaning, 5*l.* 5s.; H. Passmore, 5*l.* 5s.; E. Boehmer, 2*l.* 2s.; M. F. W. Bunney, 2*l.* 2s.; Guy M. Nicholson, 2*l.* 2s.; C. E. Simmons, 2*l.* 2s.; D. Stewart, 1*l.* 1s.; G. H. Smith, 1*l.* 1s.; P. Rider Smith, 1*l.* 1s.; F. J. Potter 1*l.* 1s.; W. B. Dukes, 1*l.* 1s.. The present total amounts to 3,568*l.* 13s.

The Chairman said he was glad to notice that there were more guinea donations to announce that evening.

The Chairman announced that a meeting of the Discussion Section would be held on the 24th inst., when Mr. F. G. W. Buss would read a paper on "The Clerk of Works: his Duties and Responsibilities."

Mr. H. P. G. Maule, Hon. Secretary, announced that the first spring visit would be made, on the first prox., to Christ Church, Brixton-road, by permission of the architect, Professor Beresford Pite.

Mr. T. C. Cunnington then read the following paper on

Architectural and Constructional Engineering.

Mr. President and Gentlemen,—When promising to read a paper upon "Architectural and Constructional Engineering," the paramount idea was to endeavour to interest the members in the subject, whatever may be the diversity of opinion in regard to what I may have to say relative thereto. Nevertheless it is a subject I would suggest it is desirable and advisable that every architect or member of the Association, particularly the younger ones, should seriously consider, having regard to its increasing importance. To lay the subject before you in as concise a form as possible, I will describe a series of steel-framed structures that have been erected recently. In the first place, I propose to deal with American tall structures, and then give some examples of roofs executed to fulfil specific requirements.

In designing tall business buildings on the American principle, the initial inception and purport of their being are business propositions, erected for the advancement of business interests and enlargement of the income of the owner of the site. In buildings so designed many of the engineering problems are shorn of difficulties, and their solution becomes simply the working out of the inevitable and logical trend of the underlying idea of the general plan.

The disposition and subdivision of an enclosed space is the foremost problem, and the first element in its solution is the use and occupation proposed for the building by its owners. This may require few rooms or many, large rooms or small, or a combination of both. Under all conditions which may govern the subdivision of space it is possible, no matter how small or how irregular the necessary dimensions of the proposed rooms may have to be, to so adjust and group their spacings that there will be a regularity and symmetry which permits the introduction of a unit of subdivision. In determining this unit of subdivision the directing factors will be: (*a*) the necessary dimensions of the rooms resulting from the proposed occupation; (*b*) the requirements of the framing of the skeleton of the building; and (*c*) the exigencies of the artistic expression of the proposed external presentation. The unit of subdivision will also be the unit of construction and the unit of design. If the individual rooms are quite small it may be well to combine two or even more into one unit. Within certain limits the economy of material in the construction of the skeleton leads to the adoption of a large unit. The greater relative strength of the deeper beams, the smaller number of connexions, the smaller number of pieces to be handled, all favour the large unit; and the reduction in number of pillars, affording greater freedom in subdivision and utilisation of space, will enhance the commercial availability and value of the building.

Again, the greater depth of beams and increased dimensions of pillars enlarge contact areas and riveting surfaces at junction points, and thus give better opportunity for attaining a rigidity of connexions, which is, in itself, a long step toward efficient wind-bracing. On the other hand, greater beam depths increase the height of each story, which, where there are legal limitations of height of buildings, may cause the loss of a story, and, therefore, of its possible rental. Increased span and consequent greater height of beams may involve additional cost of floor arches, perhaps counterbalancing, or even exceeding, the saving in cost of beams and pillars.

Whether the unit of subdivision be larger or smaller is undoubtedly an important factor in the artistic success of the external treatment of the building, but the personal equation of the designer and so many other varying conditions influence and affect artistic results that each case must be decided on its own merits. However, the gain in wall surface incident to the use of larger, and therefore deeper, beams is unquestionably also an aid to the artistic development of the design.

Thus far, what has been stated relates to the adaptation of the building to existing conditions and wants. So much capital is invested in a modern high building that its design should embody certain general preparations for possible future changes of use and occupation, so far as these can be made without impairing present usefulness; and, above all

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things, its design should embody all that is necessary for ensuring permanence and comparative indestructibility of structure. This at once draws the attention of the engineer to the character of the foundations, unless these should fortunately happen to rest upon a uniformly and permanently incompressible soil.

With all the ingenuity and the economy of time and money incident to its application, it must be admitted that the so-called Chicago raft foundation cannot be recommended for use upon compressible soil, by reason of its liability to serious disturbance by future underground works in adjacent or neighbouring streets; but that the footings should be carried through the compressible strata to the underlying rock, and for this purpose timber piling cannot be trusted as affording a guarantee of safety for many years, unless there is absolute certainty of maintenance of water-level in the underlying soil. This will, in many cases, make concrete piles, or caissons containing masonry or concrete piers, the only scheme of foundation construction which warrants the permanence of the supports of the structure.

The first building I propose to describe will be—

The Park-row Building, New York, Mr. R. H. Robertson being the architect, and whose name is known in connexion with the American Trust Society's Building, the Corn Exchange Bank, &c., and Mr. Nathaniel Roberts, the engineer, the latter being responsible for the whole of the structural steelwork, and it is this portion of the building that I wish more particularly to describe as typical of American high-building construction. The building belongs to the Park-row Construction Co., and occupies the site of the old International Hotel, opposite the Post Office. It is twenty-six stories high in the middle part, while the two towers are each four stories higher, making in all thirty stories. The total height of the building from the level of the kerb in Park-row to the top of the cupolas is 386 ft. The building frontage is 103 ft. 11 in. in Park-row, 20 ft. in Ann-street, and 47 ft. 10 in. in Theatre-alley, while the depth from Park-row to the Alley is 153 ft. 7 in., and the area covered is 15,000 square feet. The structure is carried entirely on piles driven into a sand foundation to a depth of about 20 ft. There are about 3,500 piles used in the construction. They are of round American spruce, free from knots, with the bark left on. They are from 10 in. to 14 in. in diameter at the head, and the load on each does not exceed 16 tons. They are driven at from 16 in. to 18 in. apart, centre to centre, commencing at the centre of each group and working outwards, while the rows are about 24 in. apart, centre to centre. The heads are cut off below the level of ground water, or at 34 ft. 4 in. below the level of the kerb in Park-row. From 12 in. to 16 in. is excavated out around the head of each pile, which space is filled in with concrete composed of 1 part Portland cement, 2 parts sand, and 5 parts broken stone not more than 2½ in. cube. The concrete is levelled up flush with the heads of the piles. Upon the top of the concrete are laid granite blocks to receive the brick piers which carry the grillage beams to be described later.

The column loads carried by the foundations of this building are very high, some of them exceptionally so. It was therefore necessary to distribute the pressure on the grillage beams as evenly as possible. The need for great care in this matter will be evident when we say that the weight of the steelwork alone is 9,000 tons, while Mr. Roberts estimates that the weight of the building is 56,200 tons, or a total of 65,200 tons. Most of the columns rest on distributing girders, each girder carrying, as a rule, two columns, though in one case there are as many as four columns on one girder. The interior columns have no distributing girders, but rest directly on the grillage beams, and have each an independent foundation. Each foundation was separately designed for the load it had to carry, and the size of the girders and the grillage beams vary accordingly.

A typical distributing girder is shown in detail together with the grillage beams and granite coping blocks underneath them. This girder supports two columns, each carrying about 1,100 tons, so that the girder itself sustains a load of about 2,200 tons. It is 26 ft. long and 8 ft. deep, and has four web plates, each ⅞ in. thick. There are four angles, 6 in. by 6 in. by ⅞ in., in each flange, together with three plates, each 2 ft. 8 in. wide by ¾ in. thick. The girder is carried on thirty-five joist beams 12 in. deep and 5 ft. long, which are separated by distance pieces. In the foundation in question there are four of these distance pieces between every two beams, but in some of the foundations, where the length of the beam is 6 ft., there are six distance pieces between every two beams. The distance pieces are box-shaped, and have milled surfaces which bear evenly on the top and bottom flange of the beams. The grillage beams rest on the top of the granite caps, and are bedded on cement. In the manufacture of all the distributing girders it was particularly specified that the vertical angle iron stiffeners should have a good bearing against the top and bottom flanges.

This girder for Theatre-alley front is carried on sixty-one joist beams 12 in. deep and 4 ft. long, these being placed on the top of the granite caps, as described. All the columns which do not rest on distributing girders are carried on short independent girders which rest on joist beams supported by the grillage beams, so as to distribute the weight evenly over the granite caps of the piers.

The floor beams are generally composed of the joist beams bolted together with ¾-in. bolts, and have cast-iron distance pieces between them. There are three or four distance pieces to each span, and they are so made that the flanges of the joist beams will not be less than 1½ in. apart. The beams which carry the fireproof flooring are all tied together with ¾ in. bolts to take the thrust of the flat arches. The full diagonal line on this plan represents the horizontal wind bracing which is inserted at each floor level. The floor beams are framed so that the bottom presents two different levels, one 5 in. above the other. In the area, where 15-in. beams are used, the beams and girders are framed flush, the 10-in. and 12-in. beams being framed flush at the bottom, which is 5 in. above the bottom of the 15-in. beams. Box and lattice girders are used for connecting the columns at the walls, and they are attached to the columns in such a way as to make the connexions as stiff as possible, in order that it may do service as vertical wind bracing. Great lateral stiffness is given to the building in this way.

The lattice girders all have the flange angles kept apart, to allow an easy means of attaching the cast-iron lintels and sills. These girders are connected at the top and bottom flanges to angle pieces on the columns, which also give great lateral stiffness to the building.

As stated, some of the main columns each carry about 1,100 tons on the lower length, which rests on the distributing girder, and though this load is not quite the heaviest carried by any individual column, it is not far short of the maximum, and as these columns are in the Park-row front and are typical of most of the others in the building, I have taken them as an example. All the columns are of single-box construction except one, which is double. They are all built up of plates and angles, and are strengthened according to the load they have to carry by the addition of plates. This forms a simple and efficient means of varying the sectional area of the column without materially altering its radius of gyration, and enables a great number of plates of one standard size to be used in different columns, thus reducing very materially the cost of manufacture.

The bottom length of the column, where it rests on the distributing girder, has a flange plate at right angles to its axis, which plate is securely riveted to the body of the column with angles by means of a double line of rivets, while at its upper end, where the next column length rests, it has angles forming a flange, but no plate. The ends of the two lengths of columns are faced so as to bear very truly one on the other, and are riveted together through each angle. In addition to this there are two splice plates, one on each side of the column, as shown. These plates are firmly riveted to the lower length in the shops, but the part projecting above the top is riveted to the next length of column above when they are erected on the site of the building. These rivets pass through the splice plates and the sides of the column. This forms a very strong joint, and is preferable to the method of fixing by means of angles alone, as it makes the whole column much stiffer and better able to resist the side stresses due to wind. This way of jointing the different lengths of the column is adopted from the bottom to the top, so that the combined lengths are formed into one united whole, which extends from the cellar to the roof.

For carrying and fixing the box and lattice girders which carry the walls, and also the floor girders, angle brackets are riveted to the body of the column in order to support the ends of the girder where they abut against the plates. These brackets are stiffened by vertical angles which bear up against their underside, and thus form a very strong support. There is also an angle bracket riveted to the side of the column some distance above the lower one, and in an inverted position in regard to the latter. The distance between these angles is equal to the depth of the girder which abuts against the column at this point, and when the girder is in place its upper flange is riveted to the upper angle in such a way as to add lateral stiffness to the building, for it has been found absolutely necessary in these high buildings, which are subject to great wind pressure, and where it is often very difficult, and sometimes impossible, to put in diagonal wind bracing, that either the method adopted in the present case or the use of knee-brace or portal bracing becomes necessary in order that the building may have the lateral stiffness which is required for its safety.

This method of stiffening by rigidly fixing the girders to the columns is employed in this, the Park-row building, in conjunction with diagonal bracing. In some of the other lengths of columns, the brackets which carry the girders are formed of plates as well as angles, but in almost every case the girders are riveted through the upper flange to angle brackets on the columns.

All the columns in the walls are carried up 3 ft. above the roof beam, and are there connected with a line of 8-in. channel under the coping.

The Montgomery Ward & Co.'s building at Madison-street and Michigan-avenue, in the heart of the Chicago business district, is a twelve-story commercial and office building with 86 ft. frontage, 159 ft. high on Michigan-avenue. For business reasons it was specially designed to be conspicuous, and on this account a tower 390 ft. high and 40 ft. square at the base was made the central feature of the Michigan-avenue front, and which contains thirteen additional stories above the main roof. The lower three stories of the main building are treated as a base, 45½ ft. high, and are faced with rusticated courses. The twelfth story is treated as an entablature, and has a deep roof cornice. The main entrance is through a two-story pedimented portico, embellished with marble sculpture, the tower forming a central feature, rising from the entrance with unbroken shaft lines continuous through the interrupted roof cornice to the top of the eighteenth story, where there is a cornice course, and above it the nineteenth story balcony, with arched windows surmounted by a deep moulding which forms a capital at the twentieth story. Above this the sides of the tower are narrowed to about 30 ft., and at the twenty-second floor begin to converge for the pyramidal roof.

The concrete foundation piers are set on steel grillages on about 1,200 15-in. piles. These are 52 ft. long, driven to 68 ft. below grade, and are calculated for maximum loads of 25 tons each. The steel columns are of closed rectangular cross-section, made up of pairs of channels and flange cover plates, the largest having an area of about 180 square inches of steel. The tower is calculated for a wind pressure of 30 lbs. per square foot on its vertical projections above the main roof, and the remainder of the building is calculated for the same wind pressure on all exposed vertical surfaces of the two end bays of each elevation. The wind stresses parallel to Madison-street are assumed to be resisted by the rigidity of the walls, floors, and partitions, and by the strength of the beam and column connexions. In the direction parallel to Michigan-avenue there is special wind-bracing, consisting of solid plate stiffened knee-braces at the top and bottom of each end of the wall girders, and of horizontal plate girders, 30 in. deep, with 6 in. by 4 in. flange angles, at every story between the corner column and the one adjacent to it. A similar construction on all sides of the tower is carried up to the twentieth story, where the knee-brace brackets are replaced by longer and heavier knee-brace struts connecting the tops of the corner columns to the system of plate girders which forms a rigid horizontal frame-

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work supporting the overhanging twentieth floor.

There are twelve outside columns and no interior ones in the tower. Up to the eighteenth story its floor framing consists of two 24-in. transverse joint-beams supported on the two pairs of intermediate columns, and of seven longitudinal lines of 8-in. joist-beams which are supported by these girders and by the pairs of 15-in. wall-girder channels which connect the columns, and in four places by direct connexion to the intermediate columns. A 9 ft. by 10 ft. panel in the middle of the floor has additional framing for the circular elevator shaft. At the eighteenth story light channels, beams, and angles are bracketed out a short distance from the columns just above the floor line to carry a projecting terra-cotta belt course.

The Electric Tower of the Pan-American Exposition was a temporary structure, its framework being of steel members with riveted connexions, and is covered with wooden lath and studs to support the surface of the walls. All the floors are of steel beams and girders filled in solid with concrete slabs. The column foundations are at an elevation of 23 ft., and the floor D 234 ft. above foundations; the tower is made in vertical panels of from 15 ft. to 24 ft. high. In this part there are twelve outside and four inside columns arranged in four rows of four each. Besides the horizontal and diagonal braces in the side elevations of the tower, there are corresponding systems in the other elevations and sections of all the rows of columns.

The total dead load is assumed at 1,649 tons, and the total live load at 600 tons. The maximum unit strain from live and dead loads is 16,000 lbs. per square inch, and the columns are proportioned accordingly. Where wind strains are added the unit strains are increased 25 per cent.

The piers for the corner columns are made with 9 ft. by 12 ft. concrete footings 2 ft. thick with two 8 ft. square crossed layers of 12 in. by 12 in. timbers, and another layer 5 ft. square on top, to which the pedestals are secured by bolts. The pedestals have gusset plates, stiffened by vertical and inclined angles, riveted to both flanges of the column, and to double 30 in. by 48 in. base plates 1¾ in. thick. At the third floor level there are four plate girders, each 5 ft. deep and 34 ft. long, which form a square connecting the tops of the lower sections of the four inside columns. Opposite these girders in the middle panels of the outer faces of the tower are four similar plate girders, each of which is connected with the inside girder by two plate girders 3 ft. deep, which carry one column each of the upper framework of the tower. The other columns of the upper section which start at this level are carried directly by the columns or by the main girders of this tier. All beams and girders are web-connected; all diagonals are riveted at intersections, and their end connexions are riveted to pairs of gusset-plates which are attached to bent plates on the horizontal members, or are riveted to the column flanges. The columns are spliced with web and flange plates, as before described.

Wind-bracing.—In arranging a building for wind-brace sections, sometimes the floor plans will permit a symmetrical arrangement of the cross-section in which the wind-bracing is to be put. Frequently, however, no such desirable arrangement is possible, and only certain sections can be utilised. This complicates matters somewhat, but careful study will usually permit a satisfactory solution of the problem.

Wind-bracing in a high building performs, during and after erection, the very practical office of facilitating erection by enabling the columns to be maintained in their correct vertical position; for which the best shop work, the play of the temporary bolts in the holes, is sufficient to allow a serious deviation from the vertical to occur, and with the temporary bracing of wood struts this can rarely be prevented. Departure from the vertical of 2 in. in a height of 100 ft. can readily occur, and is not noticeable except when compared with a plumb-line. Wind-bracing can be made of certain lengths to fit between the columns, and requires that each column shall be in its proper place before the bracing will fit, so that no great error can accumulate.

A careful comparison of the treatment of wind forces as applied to tall buildings of to-day leads one to the conclusion that the designers differ very materially in regard to the forces to be resisted, the strength of material employed, and the most efficient details of construction. A building constructed with a well-proportioned iron frame should be safe if provided with brick partitions, or if the base is a large proportion of or equal to the height, or if the exterior of the iron framework is covered with well-built masonry walls of sufficient thickness, for the rigidity of the solid walls would exceed that of a solid frame to such an extent that, were the building to sway sufficiently to bring the bracing into play, the walls would be damaged before the rods could be brought into action. Hence the stability must depend entirely either upon the masonry or on the iron framing, and in veneer buildings, which are being particularly considered, the latter system of bracing the metal work must be used, with the walls as light as possible, simply enclosing the building against climatic and injurious forces. Each building offers its own peculiar conditions to the carrying out of efficient wind-bracing, and many factors must be considered for a judicious solution.

The height, width, shape, and exposure of the structure, as well as the character of the enclosing walls, will determine the amount of wind pressure to be provided for, while the details of construction, the internal appearance, and the planning of the various floors will largely influence the manner in which the bracing is to be treated.

The shears are undoubtedly reduced to some considerable extent through many practical considerations, having regard to the dead weight of the structure itself, the resistance to lateral strains offered in the stiff lateral riveted connexions between the floor system and the columns, the stiffening effects of partitions (if continuously and strongly built) and linings, coverings, &c., all tend to decrease the distorting effects of the wind pressure.

Exterior Walls—Piers.

Exterior piers which carry their tributory floor and roof loads; besides, the weight of walls themselves is capable of at least three separate treatments, each suited to its own peculiar circumstances.

1. Where the outside piers are constructed entirely of masonry carrying all of the wall, floor, and roof loads, which come upon them by means of masonry alone, such construction is used in buildings of moderate heights, and constitutes the ordinary type of building.

The objections to such piers of solid masonry are threefold, where structures are higher than (say) sixteen stories, viz.:—

(*a*) The modern requirements of plenty of light and air in all offices demand that the windows be broad and numerous and the piers narrow. In the highest buildings of the present day hardly any masonry construction is strong enough to carry the necessary roof and floor loads besides its own weight for so great a height and with so small a cross section as is desired.

(*b*) The second objection to such large masonry piers is that they take up too much valuable renting space, and where the rent of offices is proportioned at per square foot this becomes a matter of no inconsiderable importance to the owner. Also, the weight of these solid masonry piers would so add to the load per square foot that many of the most remarkable examples of architectural engineering would be well-nigh impossible.

2. The second treatment of which the exterior piers are capable is that in which metal columns carrying the tributory floor and roof loads are placed inside the masonry piers, while the latter support themselves and the "spandrels" only. The spandrels constitute those portions of the exterior walls lying between the piers and over and under the window spaces.

3. The third method of constructing the exterior piers is the one more approved at the present stage of architectural engineering, the one which has undoubtedly opened up the means for building the highest structures. In this all the weights are thrown on the metal columns, which, in place of solid piers, are surrounded with a protective shell or covering only, made of ornamental terra-cotta or brickwork securely anchored to and supported by the columns at the various floor levels. This construction undoubtedly gives the minimum weight per foot of height and makes possible such small piers as are indispensable for light and desirable offices. The increasing value of ground space, the demands for rapid construction, and the necessity for the lightest possible loads on the subsoil, have all contributed to the success of this type.

The spandrels vary greatly, depending largely upon the architectural effect contemplated by the designer in his arrangement of the material, and consequently general descriptions of spandrels can hardly be given as applicable to general practice. The spandrels are supported by the masonry piers where such wall-bearing piers are used, or in the "veneer construction" by the metal columns in the walls. The face of the spandrels may be "flush" with the piers or "in reveal," that is set back from the face of the piers. In the first case the wall presents a nearly unbroken surface except for the terra-cotta sills and window caps, while the second method accentuates the piers and throws the spandrel walls in reveal. The former case is generally of far simpler construction, and avoids many embarrassments in irregular bracketing from the columns which becomes necessary where the spandrels are recessed.

Whatever be our views with regard to these gigantic structures, whether we look upon them charitably as necessities of the time, or condemn them as hideous and vulgar monstrosities, the fact remains that the number of them increases, and we do not think it possible for any one to help admiring, either from an architectural or an engineering point of view, the skill and ingenuity displayed in their construction and the daring boldness of their conception. They may not be beautiful, but at least we may suppose that they are useful, or hard-headed Americans would not continue to build them. Where every square foot of ground has a very high value, they enable a certain available area to be multiplied 20, 30, or perhaps 40, 50, or even 60 times, thus giving facilities for a like financial increase. If they teach us nothing more, they at least show that the architect and engineer can work together so as to produce results which probably neither of them could achieve alone. This is a lesson which in our country we seem slow to learn, but which, if we could but take to heart and act upon, would probably result in adding beauty and security to our structures, whereas at present some of our engineering works justly merit the architectural "finger of scorn" being turned upon them, while the structural attempts of many architects invite the profane ridicule of engineers. Until this lesson has been learned we cannot achieve that measure of success, either architecturally or from an engineering standpoint, that is possible.

The questions to be decided in these modern structures are so numerous and the difficulties so great, that it has become almost a necessity that the work should be specialised, and so it comes about that an architect is made responsible for the general arrangement of the building and for what we may call the clothing of it, while the steel frame or skeleton is the work of a skilful engineer experienced in such matters. There are few architects capable of undertaking both the architectural and the structural details of these buildings, and in some cases where the experiment has been tried the result has been disastrous, for it is manifestly impossible for one man to be able to properly master both branches of the art sufficiently to enable him to meet and overcome the many difficulties to be faced in a way that is possible when specially trained minds are employed to carry out each section.

The field is surely sufficiently wide to prevent any conflict of interests from being felt, and yet how unwilling is each at times to concede to the other his deserved position! So long as engineers continue to put up structures hideous to a degree in important positions, the necessity for the help of the architect is manifest.

Design and construction are not synonymous terms, as has been proved over and over again; and when we consider the vast size of some of the high buildings in the States, the amount of capital they represent, and the number of lives depending on their stability, the Americans show their wisdom by bringing to bear in each department the highest specialist knowledge they can command, for by so doing there is no doubt they attain their desired end more quickly, with greater economy, and with an assured safety that would otherwise be lacking. In the old days the architect was sufficient in himself, but now every year he becomes less able to cope with the structural difficulties that enter into

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modern building work. Therefore the sooner it is recognised that he must obtain help from the engineer, and the engineer from him, the better will it be for all concerned.

With all our pride in the achievements of modern architecture and engineering, as exemplified in the construction of the modern high business building, we must not forget that structures equally tall, or even taller, have been reared in former generations, and demonstrate by their continued existence that there were long before our day architects and engineers whose command over the materials and forces which make for stability and permanence of structures was at least equal to our own. Yet these ancient structures are altogether unutilitarian, and could not have been otherwise, by reason of the absence in the day of their erection of means of lifting great loads to great heights in quick time and at small cost.

Roofs.

The Buffalo Savings Bank is located at the corner of Main, Huron, and Genessee streets, in the heart of the Buffalo business district, and occupies a rectangle of about 75 ft. by 69 ft., with a triangular extension 56 ft. long on one side. The building is occupied exclusively by the bank, and consists of a two-story main rectangular part, about 130 ft. high, and a three-story wing, about 50 ft. high, on the triangular extension of the plot. In the main part of the building the banking-room, 65 ft. high, occupies most of the floor space. It has an area 59 ft. square, unobstructed by columns, and surmounted by a domed ceiling supported on an octagonal steel framework; between same and the outer walls are galleries, stairways, and corner rooms. Above the dome there is a steel platform supporting an octagonal office story, 11 ft. high and 70 ft. wide, which is surmounted by a domed roof 53 ft. 6 in. in diameter and 33 ft. high above the horizontal ceiling.

The New York Clearing House on plan is an irregular St. Andrew's cross, inscribed in a trapezoid with sides 80 ft. to 93 ft. long. The floorbeams and girders are supported by the walls and by thirty interior columns, and the lower six tiers are continuous across the whole area of the building. In the centre of the building six columns are arranged on the side of a 30-ft. by 40-ft. rectangle, and extend up only to the fourth floor, or sixth tier, above which there is a clear space under a dome 60 ft. 6 in. in diameter on the outside of the framework.

The Dome has a nearly hemispherical exterior surface, and is supported by an octagonal arrangement of web-connected plate girders. It rests on each of these girders, and intermediately on 20-in. rolled beams across their angles which form with them a sixteen-sided polygon. The girders are supported on the tops of the columns at the angles of the octagon except on one side. Here the 16-ft. side of the octagon is the middle part of a 47-ft. riveted truss, which carries the ends of the adjacent girders, and is supported on special columns. This truss has a double-triangular web system, with all connexions riveted. The tension diagonals are flat plates; the bottom-chord web-plates are 18 in. deep, and the fourth story floorbeams are connected to the webs.

The end vertical members of the truss are practically continuations of the columns that support it (see also details Wolverhampton Public Library). These columns are spliced at every story with four web-plates. The bottom of the lower section has eight vertical connecting angles riveted to the vertical web stiffener plates of the extended base, the base being 5½ ft. square, with eight vertical web stiffener plates and four knee-brace angles on the main diagonals to stiffen the corners. Other columns have bases 3½ ft. square, which are similar to these except that the knee-brace angles are omitted, and some of the lighter columns have 2 by 5½ ft. bases stiffened with a pair of plates, which virtually make them double-web girders.

There are *sixteen radial dome trusses*, seated on top of the polygonal framing of girders and having their top and bottom chords riveted at the centre to a pair of horizontal circular steel plates 6 ft. 4 in. in diameter. Each truss is made in two sections, riveted together through the flanges of web members, which are perpendicular to the dome surface. Trussed purlins 6 ft. deep are connected to the trusses in the planes of these members, and support at their centre points intermediate curved rafters extending to the foot of the dome. The trusses are also connected by horizontal circular T-bars riveted to their top and bottom chords, to support the roof and ceiling respectively. The horizontal reactions at the lower ends of the radial trusses are provided for by a circular vertical steel plate like a hoop around their feet.

Mr. R. W. Gibson was the architect of the building.

The Armoury roof of the Forty-seventh Regiment, Brooklyn, is 300 ft. by 197 ft. on plan, and square hipped about 32 ft. high at the eaves and 90 ft. at the ridge. It has four uniform planes, those of the two sides intersecting in a longitudinal ridge line about 104 ft. long, which terminates at junction of hips. There are four main transverse centre roof trusses of a span of 191 ft. 4 in., centre to centre. From the centres of each of the end ones radiate two hip trusses extending to the corners of the building, and one longitudinal truss to the middle of the end wall. Each hip truss also supports two pairs of short trusses parallel to the main trusses. The main trusses are three-hinged arch ribs of 84 ft. rise, seated on piers extended from the inside faces of the side walls just below the floor level. Their intrados is a continuous curve from the floor line at the skewback to the crown; the extrados is a curve of larger radius than that of the intrados, so as to give the truss a depth of about 15 ft. at the haunches and 5 ft. at the crown. The trusses are built entirely of angles and plates, and have T-shaped top and bottom chords and X-braced web members. The horizontal thrust is taken by a pair of eye bars connecting the skewback pins under the floors. The hip trusses are similar to the semi-trusses of the main spans, and the short corner trusses conform to the general design of the larger ones. The vertical ends of the trusses are connected by horizontal struts at mid-height and by light, deep, inclined lattice girders at the haunches. The top chords of the trusses are connected in each roof surface by six trussed purlins of about 34 ft. span, each panel of which supports six lines of wooden rafters. The roof is also braced by diagonal rods in alternate panels of the main part and in the centre panels of the ends, where most of the rafters are omitted to avoid confusion. The depths and seats of the purlins are so arranged on the curved top chords as to set the rafters in three straight lines, forming successively decreasing angles with the horizontal in the three sections from the eaves up to the ridge. A low clerestory is thus formed at the foot of each rafter, and is glazed with pivoted sashlights, affording light and ventilation. Horizontal latticed girders, with vertical webs, are built into the lower part of the ends of the trusses and support cantilever brackets, carrying the gallery around both sides and one end of the hall. The arch ribs and bottom chord-bars are pin-connected, and the short trusses are connected to the hips by bent plates and angles, as shown in the detail drawing. The trusses are seated on massive cast-iron pedestals, each anchored and built into the masonry which react on bottom-bearing plates.

Colchester Town Hall Roof.—The roof over the Moot Hall, about 100 ft. by 40 ft., is constructed with seven principals, the ends of the roof being hipped. The high pitch and the conditions to be complied with necessitated nominally two different systems of trussing. By reference to plans it will be observed that there are two pairs of principals placed 3 ft. 1½ in. centres. This method was adopted to carry the fire and ventilating flues from the lower stories up to the chimney-stacks that are placed on the front slope and near the ridge line, the flue pipes in same being embedded and surrounded in concrete. Seating angles and connecting plates are riveted on the intrados of the principals to receive the wood purlins or framework for the barrel-vaulted ceiling. The principals are made of double angles 4 in. by 3 in. by ⅜ in., and ⅜ in. web plates in the lower part or legs, well stiffened and riveted together. The hip rafters are also made of plates and double angles, so as to receive the purlins and other framing. These principals bear upon the front wall masonry and in the opposite wall upon specially built steel stanchions to which they are riveted. These stanchions stand upon steel plate girders at Moot Hall floor level, the girders being supported by compound stanchions made up of joist and plates, and extend to below the lower basement floor level. The purlins are 3½ in. by 3½ in. by ⅜ in. angles, and trussed, to which are bolted the wood purlins that receive the roof boarding.

Henley Town Hall Roof.

Henley Town Hall roof is constructed with six steel principals, Mansard-shaped outside or extrados, and semi-circular on intrados. Each principal was made in three sections for convenience of transit (the span being 40 ft.). They are bolted on the radial line at the junction where the sloping roof meets the horizontal. They are made of tees, angles, bars, and plates riveted together. Angle seatings and cleats are provided on the intrados to receive the purlins or the principal of the framing.

"Electra House, Finsbury Pavement."

Reverting to what has been previously said respecting the minimum size of piers and superimposed loads, I may call attention to the conditions that had to be fulfilled in this building. By reference to the details it will be observed that the front walls are carried upon stanchions within the granite piers, they (the granite piers) not being of sufficient sectional area to support the superincumbent load. These stanchions, together with the loads previously mentioned, also support the divisional walls and chimney breasts on plate girders, from first floor level to above roof as shown on detail.

The following series of typical examples were then shown on the screen by the lantern:—

Slide No. — *Description.*

1.—The Auditorium Buildings, Chicago. Messrs. Alder & Sullivan, architects.
2.—A glimpse of Broadway, New York city, with the buildings of the American Surety Co. and the Manhattan Life Insurance Co.
3.—The St. Paul Building, New York. Twenty-five stories; total height above pavement, 317 ft. Mr. G. B. Post, architect.
4.—The Hotel Majestic, New York. A typical example of steel-frame construction.
5.—The Queen's Insurance Building. Seventeen stories; 226 ft. high. Messrs. G. E. Harding & Gooch, architects.
6.—Three characteristic New York street corners.
7.—A twelve-story New York warehouse.
8.—The St. Paul Building, New York, during erection. Mr. G B. Post, architect.
9.—The Commercial Cable Buildings, New York. Twenty-two stories; 305 ft. high to top of dome. Messrs. G. E. Harding & Gooch, architects.
10.—The Quaranty Building, New York. Messrs. Alder & Sullivan, architects.
11.—The Bowling Green Building, New York. Sixteen stories; 234 ft. high. Mr. W. G. Audsley, architect.
12.—The Postal Telegraph Building, New York Fourteen stories; 191 ft. high. Messrs. G. E. Harding & Gooch, architects.
13.—The steel framing of the Royal Pavilion, New York. Messrs. Rossiter & Wright, architects.
14.—A construction view of the New York Life Insurance Co.'s Building. Messrs. Jenney & Mundy, architects.
15.—A twelve-story warehouse. Messrs. Cleverdon & Putzel, architects.
16.—The R. G. Dun Building, New York. Messrs. G. E. Harding & Gooch, architects.
17.—The Mechanics' Bank Building, Brooklyn, New York. Mr. G. L. Morse, architect.
18.—A constructional view of a thirty-story office building, Park-row, New York.
19.—Photograph of the Park-row, New York, taken when the steelwork had reached to about the tenth story.
20.—Typical plan of one floor of the same building.
21.—Front elevation and sections of the same building.
22.—Details of a typical stanchion from foundation girders to roof level, which shows the sections of stanchions, bracketings, &c., to receive the girders.
23, 24.—Further details of similar stanchions.
25.—Part of foundation piers for the same, thirty-story office building.
26.—The roof over the Moot Hall, New Town Hall, Colchester.
27.—Another view of same roof taken at a higher level. Mr. John Belcher, architect; Wm. Lindsay & Co., engineers.
28.—View showing the stanchions supporting the roof trusses over the same Moot Hall.
29.—Exterior view of Colchester Town Hall during erection.
30.—Part view of steelwork, first and second floor levels, Messrs. Morgan & Co.'s premises, Long Acre. Mr. E. R. Burch, architect; Wm. Lindsay & Co., engineers.
31.—Ground and first floor level of same building.
32.—Reverse view of same building, showing the amount of loading upon the naked steelwork during erection.

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33.—Detail of Henley-on-Thames Town Hall roof.
34.—Interior of same roof before covering fixed. Mr. H. T. Hare, architect; Wm. Lindsay & Co., engineers.
35.—View of Electra House, Finsbury-pavement.
36.—Another view of same building, taken from the new electric station, Finsbury-pavement. Mr. J. Belcher, architect; Wm. Lindsay & Co., engineers.

The Chairman said they must all recognise the great pains Mr. Cunnington had taken in the preparation of his lecture, and they were much indebted to him for it and for the diagrams and lantern views he had shown. They had received one or two communications on the subject, which he would ask Mr. Maule to read.

Mr. A. T. Walmisley, M.Inst.C.E., wrote that he regretted that he would not be in London on the occasion of the reading of Mr. Cunnington's paper. It was a useful subject. He thought there were many structures where an engineer might profitably engage the services of an architect for the artistic portions and general arrangements of interiors as well as elevations, but that the structural parts to be designed by the engineer should in every case claim the precedence and dictate the outline of design. Look at some of our bridges: take the arch of Westminster Bridge. An engineer knew that no diagram of stresses in ironwork gave the curve here adopted for the arch. Look at the iron parapet of the Victoria railway bridge across the Thames at Battersea! An engineer admired it because it was a design that could not be made in masonry.

Mr. W. E. Riley, Superintending Architect of the London County Council, in his communication, said he had been looking recently at some views of Lower New York, and they seemed quite unfamiliar to him although he was there frequently up to thirteen years ago. The erection of numerous high buildings had brought about this great change. The narrow tongue of land between the East and Hudson Rivers, with the Haarlem River on the north, particularly hampered extension laterally, and thus was evolved in the resourceful American mind the expedient of carrying up buildings to great heights. In these buildings the steel columns were the only portions of the structure which were carried to the foundations, and they provided the reactionary forces of the weights of the buildings, each story being carried independently of the one above or below it. The cubical extent of some of the high buildings in New York must necessarily be very considerable, especially in comparison with London buildings, where, as was well known, special permission was necessary to allow buildings of the warehouse class to be of a greater cubical extent than 250,000 cubic ft., in which cases the buildings must not exceed 60 ft. in height, nor be of a maximum capacity of more than 450,000 cubic ft. He recently attended a Congress at the Paris Exhibition, and noted that one of the continental speakers drew some very forcible illustrations as to the height permitted for buildings even in London, but the horror with which he spoke of buildings twenty-two stories in height in New York City was quite indescribable. These were representative European views, because in Europe buildings were not hampered by the geographical conditions which obtain in lower New York City, although this consideration does not apply to other American cities where similar high buildings are erected. But it must be borne in mind that American cities have been laid out on modern lines, with the special advantage of enjoying a maximum of sunshine, whereas in London the limited amount of sunshine must be regarded as a factor in considering the height of buildings in relation to open spaces. The newest building code of New York City, which came into operation in October, 1900, is an interesting document. In its provisions it is noticed that any hotel, lodging house, school, theatre, gaol, police station, hospital, asylum, institution for the care or treatment of persons, which exceeds 35 ft. in height, shall be firepoof, and every other building which exceeds 75 ft. shall be similarly constructed. In a recent book on fireproof construction: "How to Build Fire-proof," by Mr. F. C. Moore, there were recorded some very interesting experiences on the behaviour of high buildings in cases of fire, and illustrations were given of the Home Life Building, which was 192 ft. high, and was intended to be fireproof. A building of five stories adjoining it took fire, and burned out every floor of the Home Life Building above its own height. The disaster appeared to have resulted through a shallow court, 20 ft. wide, used for lighting the higher building, drawing up the flames and communicating them from one window to another in the progress of the fire in the higher building. The court acted like a purposely constructed chimney in its destructive effect, though how a reputed fire-proof building burned so freely and fiercely was not so apparent. The destruction of the Windsor Hotel made a great impression in this country. The hotel was substantially built, and it was stated in some papers to have been fire-resisting, though that statement was inaccurate, as it was elicited that the floors were of open wood joists; some of the partitions were formed with "quarters," and the internal wall finishings were of wood. Such a building would hardly be classed as fire-resisting here; at any rate, it burnt with such furious rapidity that it was practically gutted within an hour and a half. There was no doubt that every such building should be as uninflammable as modern science could make it. The responsibility of dealing with life and property in such a structure was a burden no public official should be called upon to undertake. In spite of the most heroic efforts, and an expert corps of fearless, brave men, many lives were lost and property totally destroyed. In the case of the Home Life Building, the effective water head was, he understood, 108 ft., but that failed to save the building up to that height. The subject of high buildings was one of great interest, and its developments were being carefully watched. Many experts in New York City were bitterly opposed to high buildings, and freely condemned the result of recent years' work as a hideous disfigurement of the city. These views found many supporters here, but perhaps a better acquaintance with the conditions which were responsible for the problem might soften the criticisms. American engineers and architects were hampered by no insurmountable traditions. When a city railway was a necessity it was not put in an "underground" tunnel, as in London, but erected on stilts, and it answered its purpose very well. The systematic method of American thinkers had been to first grasp the difficulties to be overcome, and then attempt to solve the problems in the most practical and commonsense way, unbiassed by prejudice. If the tall building was not all that could be desired, it was another effort to solve a difficulty, and, as experience was gained, it might ultimately lead to some satisfactory result in America, but it did not seem a suitable form of structure for this part of the world.

Mr. Lewis Solomon wrote that he noticed that the author of the paper said that designers differed very materially in regard to the forces to be resisted, the strength of material employed, and the most efficient details of construction. This must be so in designing work of this nature, and it was in the different method of treatment that the clever designer varied from the every-day practitioner. Mr. Cunnington also said that the stability of a building depends entirely upon the masonry or the framing outside pure construction. He (Mr. Solomon) thought that should be emphasised somewhat, as young men were apt to think that the enclosing portion of a building was of such little use. In regard to the different treatment of exterior walls of a building, he thought the second of those described was only a variety of the third, and that only two methods should have been mentioned, viz., one where the masonry carried the superstructure, and the other where the iron carried the masonry, as the masonry in the second scheme was carried by the ironwork in a tall building. He agreed with Mr. Cunnington that few architects were capable of undertaking both the architectural and structural details of a tall iron building, but architects should design the system and leave the details to be filled in by the engineer. With regard to the roof construction, the paper led one to believe that iron domes were almost a new feature, but they were not so, as he remembered over thirty years ago, when he was connected with the design and carrying-out of the Ottoman Bank in Throgmorton-street, that there was an iron dome to the board-room, the ironwork of which, he thought, was designed by Mr. Homan (now of the firm of Messrs. Homan & Rodgers), but the architectural work was not done in any way by the engineer. In the description of Henley Town Hall, it was stated that each principal was made in three sections for convenience of transit. Some explanation of the joining of these sections might be given with advantage. He did not quite understand why reference was made at the end of the paper to the "Electra House," Finsbury-pavement, as there was no special engineering question concerned in a matter where the architect had adopted an ordinary form of construction, viz., bedding stanchions inside masonry. As far as the architecture of this building went, it was only what one might expect from such an accomplished architect as Mr. Belcher.

Mr. Thomas Blashill, in proposing a vote of thanks, said he was glad they had had another opportunity of discussing this method of construction of tall buildings, which was so foreign to our own system. He did not think this American system would be copied in this country, but there was much instruction to be got out of a consideration of the details—the splicing and the junctions, for instance, of the ironwork between the girders and the stanchions. No doubt they had noticed that the whole of the stanchions were put together by putting on covering plates at the joints. That was not done much in this country, but it seemed a good way of putting the stanchions together. He did not know whether we quite realised the size of some of these tall buildings which were to be seen in America. He noticed that the height of one of them was 386 ft.—that was one and a half times the height of the western towers of Westminster Abbey, with 50 ft. to spare, and it was within 18 ft. of the top of the cross of St. Paul's Cathedral. The heights of some of these buildings were enormous. It was to be noticed that the wall of a building in these tall structures was getting to be of less and less consequence, and there was no reference to such walls as were referred to in our Building Act. The walls of each story in these tall buildings were sufficient for each story, and carried nothing but themselves. Another thing he would mention—and he did so with a view rather of suggesting to architectural students that they should study scientific construction a little more—was the separate action of an engineer and an architect, neither of whom had very much sympathy with the work of the other. That did not seem to be exactly what one should desire, or what one would expect to lead to quite the happiest result. As regarded external design, combined with safety of construction, it would pay the young architect, in every sense, to study carefully such drawings as they saw before them that evening. There were now a good many books to be got, and a good many lectures had been given, on various parts of the subject, and it was not now so difficult as it was to study the various parts and details. They should look to the joints more particularly, for there they could learn a great deal. With regard to iron construction generally—architectural construction he referred to chiefly—at the present time the different engineering societies—the Institution of Civil Engineers taking the lead—were at work with the object of standardising the different parts of ironwork, and he might add that he had been appointed to a seat on the committee on the subject. As far as architects were concerned, they were more interested in the standardisation of joists. The idea of the committee was to do away with many degrees which now exist, and to get only joists of the size wanted. At the present time if one wanted a joist of a particular size, it was quite a matter of uncertainty whether it could be got at once, or even if it could be got at all; and the object of the committee was to settle, after a conference with architects and engineers, certain sizes—not too many, but enough—which manufacturers of any consequence would roll and keep in stock.

Mr. Max Clarke, in seconding the vote of thanks, said that Mr. Cunnington had practically told them that they as architects should steer clear of designing these purely engineering structures and leave that for the engineer to do, and he (the speaker) thought they would all agree with that. There was no doubt that if the time should unfortunately arrive when such structures were built in London the architect and engineer would *have* to work together. He was very anxious to know more about the foundations of these tall buildings. The piles in one instance referred to by the lecturer were from 10 in. to 14 in. in diameter at the head, and they were driven in at from 16 in. to 18 in. apart, centre to centre. Later on it was

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stated that concrete was put all round, the space being from 12 in. to 16 in. around the head of each pile; but he did not understand how it was done. He would like to know whether the piles were driven in in rows, and, if so, whether the rows were adapted to the large girders which were placed upon the top It would be a great advantage to the younger members to know how the Americans disposed the concrete round the head of the piles. He once had some work of the kind to do and he was put to much trouble in the matter. They were told that piles were undesirable where there was no certainty of the maintenance of the water level in the underlying soil, *i.e.*, unless the water level were not liable to rise and fall; and that, of course, was a fact. He would like to know whether iron piles had ever been used in America for this purpose, and if so, what the effect had been. Could the lecturer give them any information in regard to what was usually called "a clothing for the ironwork"? Were the large girders in these tall buildings protected in any way?—for that was a matter for the serious consideration of constructors when they built a gigantic structure entirely of steel. What was the life of the steel? And what, if any, was the protection given to it? Some of them may have seen a letter in the *Builder* recently from Mr. E. Atkinson, the organiser of the Mutual Fire Insurance Co. of Boston, asking for information of the kind.* He had the pleasure of meeting Mr. Atkinson recently, and he learned that that gentleman wanted to find out from the English people what they thought of putting concrete round the columns. Was it a fact that in "Electra House," on each story of the building the stonework was buiit independently of the stonework on the other stories? He understood that the steelwork of "Electra House" carried the floors, and that it was surrounded by stonework which supported itself entirely from top to bottom. It was a question whether the Building Act would allow each panel to be kept distinct and the weight carried on the girder.

Mr. R. Moreland, jun., A.M.Inst.C.E., said, in reference to the foundations, as on the top of the piles were granite blocks, suppose one of the piles moved? There would be a local strain on the granite block, and as granite was not a material to resist tension, it would crack. It seemed to him, therefore, that it would have been better to have used steel instead of granite, although, of course, the steel would have been a great expense—a matter, however, of little account in the erection of these tall American buildings. In London, several large buildings had been floated on what would be called bad foundations. At one large building which he had been interested in, *i.e.*, Harmsworth's, on the Embankment, under Mr. H. O. Ellis, architect, the load was calculated, from various tests, at two tons the square foot. The whole site was brought into action for the distribution of load, and long girders were used immersed in a concrete block covering the site, and he was glad to say there had been no settlement; though he agreed that it would have been better to have gone down to a solid foundation, but the expense prohibited that. We did not have the high buildings or the great weights in England that they did in America. In London there were very few buildings of more than seven stories. Queen Anne's Mansions was an exception, and also the Carlton Hotel and Her Majesty's Theatre—a large block of buildings where the system they had been talking about had been adopted. In the majority of the diagrams of stanchions exhibited, there were a large number of plates on the flanges, but not on the web; the webs were stiffened up, but not to the same extent as the flanges, and in one diagram the stanchion was much deeper than it was wide, and it seemed to him that it would have been better the other way. The radius of gyration being unequal, the stanchion he referred to was not economical. It was difficult to make a stanchion economical from bottom to top—somewhere in its length it would have greater strength than was required. In several buildings he had had to do with, where large plate stanchions had been required, they had used solid steel columns—originally at Harmsworth's, where the whole of the basement was required for printing purposes and where a small diameter was required. These steel columns had been used at the Carlton Hotel, and in several places where an architectural effect was required and a small size. The nearest approach to an American building he had seen in London was that of Messrs. Nicholson in St. Paul's Churchyard, the architects of which were Messrs. Gordon & Gunton. The building was somewhat unique in a way, for there was no brickwork up to the second floor level. It was a narrow building, with glass all round, and the superstructure was carried on steel columns, which were kept back so that the goods could be displayed; the wall above was cantilevered over. As to the depth of girders, that was an important matter. Architects were continually wanting shallow girders, and yet they knew as well as any one the trouble there was with them. A twentieth of the span, or a twenty-fourth, was the usual thing, but in practice it seemed impossible to keep to that, and if that limit were exceeded, a lower stress should be allowed for. As to Mr. Blashill's remarks about the difficulty of getting steel delivered, his firm had lately erected a large stockyard and machine shop, driven electrically, on five acres of ground, at Silvertown, the main object being to give quick and certain delivery. His firm realised the importance of time in these large steelwork contracts, and they could give any delivery required. They had just completed work for Harrod's Stores, in which there had been 1,100 tons of steelwork manufactured and erected since August 26 last—600 tons were erected in six weeks.

Mr. H. H. Statham said the whole question of standardising sizes had arisen from the fact that Americans in some important respects had been able to beat English contractors out of the market, and had done it by keeping a supply of standard sizes ready. That was why English engineers had taken up the question, and it seemed to him, now that buildings were wanted in such a great hurry, and people wanted to get a return for their outlay as quickly as possible, the question of standardising sizes had become a very important one. It would enable architects and engineers to supply what might be called a business demand of the day; but one objection to it, even from an engineer's point of view—an objection which a member of the Institution of Civil Engineers mentioned in a recent discussion on the subject—was that it might lead to a kind of stereotyped specification, and would rather check originality in construction. He would like to know what was the meaning of one rather startling statement in the paper. Mr. Cunnington said that where every square foot of ground had a very high value, these high buildings enabled a certain available area to be multiplied "twenty, thirty, or perhaps forty, fifty, or even sixty times." Was it contemplated putting up buildings of sixty stories? For he could not see how the area was to be multiplied sixty times on any other principle, and that seemed to be more alarming than ever. At the end of the paper, in reference to "Electra House," Finsbury-pavement, Mr. Cunnington said:—"It will be observed that the front walls are carried upon stanchions within the granite piers, they (the granite piers) not being of sufficient sectional area to support the superincumbent load." He thought that was a terrible passage to hear read before an architectural society, and in a paper on architectural engineering. If we were going to build in that way, he did not see where the architecture came in at all. Architecture meant, among other things, not only building that was strong, but building that looked what it was. If we were going to erect a building which entirely depended upon steel piers and framing to carry the load, and then enclosed it with a skin which was intended to make the spectator think that the building was built of granite, but was nevertheless obviously insufficient as such, he did not think there could be a greater disaster to architectural design. The whole subject of these American high buildings was a painful one. He recognised the extreme cleverness of it, and also the manner in which such cleverness was made to serve business interests; but the result was commercial architecture, and the buildings were whited sepulchres. They were totally different in reality from what they looked, and he should respect American architects much more if they honestly put up steel structures and omitted the skin of masonry. The skin was an expensive sham, and it was of very little use. No doubt, when one did not know how these buildings were constructed, they looked very effective. He did not inherently object to tall buildings if they could be got without shutting out air and light; there was an element of the picturesque about them sometimes, and even the sublime; but when one knew that all this apparent sublimity and grandeur of effect was nothing but a skin which hid another construction, one lost all respect for it; and we did not know yet the dangers associated with these tall structures built on a steel skeleton. We did not know how long the steel skeleton would last. It would probably require a good deal of looking after, and already there had been evidence that these buildings were not fireproof by any means, nor so safe as they ought to be. In short, they could only be regarded as a very clever and spirited form of architectural development to meet a sudden demand, and he was looking for the time when even the Americans themselves would question whether they had done the best thing in encouraging this form of construction. The paper was instructive in showing how such buildings were erected, but he hoped the form of construction under discussion would not be adopted on this side of the Atlantic.

Mr. Guy Nicholson asked to what height the water companies in America supplied water. In London, in the case of a building 90 ft. high, the water companies said they could not supply higher than 70 ft., and if water was wanted higher it would have to be supplied by the hydraulic power companies. In the case of a tall building it seemed important that there should be a water supply at the top, if only for use in the case of an outbreak of fire. As to tall buildings in London, Queen Anne's Mansions seemed to be an utter failure: it was so high that the courtyard inside, except on the very lightest days, was all dark at the bottom, and the rooms facing on to it were hardly ever properly lighted. As to foundations, he believed up to now the greatest weight which had been put on very good ground had been 3 tons to the square foot. Well, in the case of a column with 1,100 tons on it, that would give about 370 superficial feet of foundations; and if one high building was put up, another might be put up adjoining it, and if this were done to any extent the foundations, it seemed to him, would cover an enormous area. If piles were driven to great depths in all cases, underground railways would not be possible. He would like to know more about the foundations of these buildings, because he supposed permission was not given to extend the foundations indefinitely.

The Chairman said he was a little at variance, perhaps, with some of the other speakers in thinking that the paper was a valuable one to them in view of possible architectural development in London. When one considered the enormous rise in ground values, the large spans to be covered, the precautions against the spread of fire now necessary—particularly in cities like London, where the streets were very narrow and land very precious—and the need of oftentimes carrying—as was done at Colchester Town Hall—the chimneys in solid masonry or brickwork over these spans, all these considerations appeared to suggest the need of some such development as that dealt with by Mr. Cunnington. What that development would be under our conditions it was impossible to say, and no doubt our municipal regulations would have to be very much varied to meet such requirements; but he looked forward to the time when the Americans would have taught us a good deal in these matters, and we should develop on somewhat the same lines. He did not know whether it would lead, as Mr. Statham suggested, to a deterioration in architecture, for he thought it would be possible to adopt a system of construction which would be a compromise between the untruthful kind of construction which Mr. Statham referred to and our present methods. He thought there was sufficient engineering and architectural talent to make it possible to get a satisfactory development in architectural construction adapted to the conditions of to-day. He was not at all hopeless that something of the kind would be done. What would happen in regard to the laws of ancient lights it was impossible to say; one could not conceive that there could exist anything such as ancient lights in America; or were exorbitant sums paid for them? If standard sizes of steel were put on the market, and if that had any tendency to prejudice design, he thought the result would be, in the future as in the past, that the best architecture would not be hurried,

* See our issue for January 4.

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but that, for that reason, it would cost more—people who wanted the best work would have to wait and have to pay for it. Last year Mr. A. T. Walmisley read before them an excellent paper on approximately the same subject,* taking the scientific aspect of the matter; the paper they had had from Mr. Cunnington was an eminently practical one. He would like to know whether any settlement had been noticed in regard to the tall American buildings? As to the possibility of having beautiful buildings built on this method, no doubt many of them had seen photographs, if they did not see the actual thing at the Paris Exhibition, of a model of one of these tall buildings. He thought it showed a very fine building, the upper part of which was a beautiful architectural composition, in spite of its height and squareness.

The vote of thanks having been heartily agreed to,

Mr. Cunnington, in reply, said as to the question raised by Mr. Max Clarke in regard to the piles, he had dealt with the matter in the paper, but he would now describe it on the blackboard. The piles were from 10 in. to 14 in. in diameter at the head, and they were driven at from 16 in. to 18 in. apart, centre to centre, commencing at the centre of each group and working outwards, while the rows were about 24 in. apart, centre to centre. The soil was excavated from the top down to 16 in. or 18 in., and concrete put in, and brought level with the top of the piles, and on the top of that were put the granite slabs which received the brick piers or footings, and then another granite slab. [Mr. Max Clarke: Does the girder rest on brickwork?] It rested on granite. As he understood it, there was a lower granite slab, then the brick footings, and then another granite slab. In some of the footings there were what were called the grillage beams on the top of the upper granite block. [Mr. Clarke: Do the grillage beams come in the centre of the brickwork?] They (the grillage beams or joists) were usually placed 12 in. to 16 in. from centre to centre, transverse to the foundation girder. [Mr. Statham: What do the grillage girders rest upon?] On the granite slabs, and grouted in in concrete. The length of the grillage beams was about the length of the top piece of granite. Or the grillage beams could be put on the top of the brickwork. [The Chairman: It acts as a large template?] That was so. As to settlements in these high buildings, there had been settlements in one or two cases, but nothing of a serious character.

The Chairman announced that the next meeting would be held on the 31st inst., when Mr. C. Harrison Townsend will read a paper on "Originality in Architectural Design."

The meeting then terminated.

COMPETITIONS.

HEARTS OF OAK BUILDING SOCIETY NEW OFFICES.—The names of the successful competitors for this work are:—Messrs. Essex, Nicol, & Goodman, Waterloo-street, Birmingham (first premium); Messrs. Meaby & Webbe, Jessel Chambers, Chancery-lane, W.C. (second premium); and Messrs. Lanchester, Stewart, & Richards, Vernon-place, Bloomsbury-square, W.C. (third premium).

NEW CEMETERY BUILDINGS, WITHINGTON, MANCHESTER.—The designs for the new cemetery buildings at Withington sent in by Mr. Ernest Woodhouse, of Mosley-street, Manchester, have been selected in this competition. Mr. Woodhouse submitted two sets of designs, and he was successful in securing the first and second premiums offered by the Council for the best designs. Mr. R. Knill Freeman was the assessor. The third premiated design was that submitted by Messrs. Alfred H. Mills & Roger Oldham, Brazennose-street, Manchester. Mr. Woodhouse has been appointed architect to carry out the work.

A MATHEMATIC REFERENCE LIBRARY FOR THE NORTH.—We have received a copy of the catalogue of the mathematical department of the Central Public Libraries at Newcastle-on-Tyne, which is a remarkable one for a provincial library. The books and tracts included in it are those in which the first object of the writer has been the exposition of pure mathematics. The catalogue includes publications of this class in various languages and of all periods. We notice that there are no less than thirty-eight editions of Euclid or of commentaries on his work. The whole catalogue under authors' names makes forty-two closely printed pages.

* See the *Builder* for December 1, 1900.

Illustrations.

NATIONAL TELEPHONE OFFICES, VICTORIA EMBANKMENT.

WE gave in our issue of May 26, 1900, a general view and plan of this building, with a description.

The illustration here given is from a photograph of the entrance as seen from Temple-avenue. It was the aim of the architect to produce a satisfactory architectural effect with the maximum amount of window space, as the ordinary classic treatment is in his opinion unsuitable for the lighting of offices in this climate.

The building is faced throughout with Portland stone. The figure-subjects represent Electricity, the Telephone, Commerce, &c. Messrs. Foster & Dicksee were the builders, and the architect is Mr. A. N. Bromley, of Nottingham.

CENTRAL BOYS' SCHOOL, OXFORD.

THIS school is situated in Gloucester Green, and as some old cottages of a picturesque nature had to be destroyed in order to make room for the new building, the School Board wished the new school to be kept as far as possible of a picturesque character.

As the Market-place is often very noisy, it was thought desirable not to place any classrooms facing that direction; the cloakrooms and other offices were, therefore, brought to the front, and bay windows introduced in them to obtain the character desired by the Board. This part of the building is of Doulting stone, the rest being of red and grey brick, and the whole being covered with Yorkshire stone slates.

The site being exceedingly irregular, a triangular hall, top-lighted, has been introduced, the classrooms being grouped round it, with a manual classroom approached by a separate staircase in the rear.

Mr. John Wooldridge, of Oxford, was the builder, his contract being about 5,700*l.*, and Mr. Leonard Stokes, of Westminster, the architect. The drawing was exhibited in last year's Royal Academy exhibition.

HOUSE AT LITTLESTONE-ON-SEA, KENT.

THIS house, known as "Sandycroft," has been built overlooking the sea to the east and the well-known Littlestone golf links to the west. Owing to the peculiar nature of the site and the need for outlook on two sides, the kitchen and offices are below the principal rooms.

Internally the house is finished partly with oak or deal painted panelling and partly canvas-covered walls. The ribbed ceilings were specially designed by the architect and run and enriched, *in situ*, by the plasterer. Mr. John Cash is the architect and Mr. G. F. Davis, of Ashford, the contractor for the whole of the work. The illustration is a first sketch which was exhibited at the Royal Academy; but the design has not been materially altered in execution.

HIGHCOMBE EDGE, HINDHEAD.

THE illustration is taken from a drawing of the staircase of a house in Hindhead. The owner, Mr. Rayner Storr, purchased the handrails, dados, balusters, and trusses from an old Georgian house which formerly stood in Old Palace-yard, on the space now cleared east of Westminster Abbey.

The adaptation of this was no easy matter, but the result has been very satisfactory; and the whole, with the new newel posts and other necessary variations, makes an interesting feature in the house. WILLIAM A. PITE.

GRESHAM'S SCHOOL, HOLT, NORFOLK.

THE accompanying reproduction of the architect's drawing shows a view and plans of the buildings, the plans of which have been approved by the Charity Commissioners, and on which work is now proceeding with the idea that the buildings may be ready for the school by the beginning of the Winter Term of next year.

The present school buildings in the Market Place of Holt were rebuilt about forty-five years ago on the site of the former and original buildings of the school, which was founded and endowed by Sir John Gresham in 1555-1556. The school has recently been reconstituted under a scheme of the Charity Commissioners, and entirely new buildings are being erected on a new site.

The site finally chosen for the new buildings lies on the north side of the Cromer-road, and is a little more than half a mile from the town. It possesses all the advantages demanded for a school site, occupying an elevated position facing full to the south, sheltered on the north and east by good belts of trees, and having a gravel and sand subsoil. The portion of the site to be at present occupied contains over twelve acres of land, allowing ample space for the buildings and playing fields. If it should be found desirable at a future time to enlarge the buildings or playing fields, additional land can be used, as the governors of the school are the owners of the surrounding fields.

The buildings, which are set back from the main road, are designed in two separate and detached blocks, the one on the west containing the Master's house and dining hall, boys' studies and dormitories, kitchens and offices, and that on the east containing the school buildings, assembly hall, lavatories and workshops. The buildings can be connected by a cloister later on if required.

In the centre of the Master's house block is placed the boy's dining hall, and on either side are placed the master's private apartments, and the boys studies and dormitories. There are forty separate studies on the ground floor facing south, and on the first floor over these are the dormitories for the same number. These dormitories have been planned on the open cubicle system, with enclosed dressing-space to each, which gives both a desirable amount of privacy as well as a facility in supervision. The breathing space in the dormitories for each boy is 800 cubic feet. Lavatories and bathrooms are placed at the end of each dormitory. The dining hall is seated for eighty boys, not including the raised portion with a high table, and from the hall a covered cloister leads to the lavatories, locker-room, and out to the playing fields. Over the dining hall is an isolated sick-room with separate bathroom and nurse's room adjoining. On the west side of the dining hall, the remainder of the buildings (which are in three stories) comprise the master's house, communicating on the main stair-landing with a corridor leading to the boys' dormitories by a pass door. In the rear of this are the kitchen and offices, with servants' rooms over approached by a separate staircase.

To the east of these buildings, but in the same line of frontage, is the school building in the form of a three-sided quadrangle, the west side containing the school assembly hall, a large apartment 70 ft. by 32 ft., with tracery windows and open timber roof of a late Gothic type. From the hall a wide corridor runs westward, with classrooms and cloakroom on the north side, ending in a return wing containing the laboratories, workshops, and lecture-rooms. The whole of the building is in two stories, excepting the hall, the greater height of which balances the remainder.

All the classrooms, laboratories, lecture-rooms, and workshops are planned and will be fitted up in the best manner to attain the best light and most effective supervision, and the heating and ventilation have been specially studied. Electric light will be used in the whole of the buildings, supplied from an installation specially erected in the school grounds.

The buildings are carried out in the Domestic Renaissance style of building prevalent in the early seventeenth century (except the hall, which has been given a late Gothic character), and are all faced with red local bricks and Ancaster stone, the roofs being covered with Broseley tiles. Special care has been paid to the sanitary arrangements, and the drainage is conveyed by gravitation to the town sewers; no tanks or cesspools are used for soil or waste drains; and the whole of this work is being carried out by Messrs. Matthew Hall & Co., of Wigmore-street.

The general contractor for the works is Mr. George Riches, of Cromer, Mr. W. Crossley acting as clerk of works. The buildings have been designed by, and are being carried out under the personal supervision of, Mr. Howard Chatfeild Clarke, architect, of London.

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THE ANALYSIS OF CEMENT AND CEMENT MIXTURES.

THE current issue of the *Journal of the Society of Chemical Industry* contains a Report of a Sub-Committee of the New York Section of the Society on "Uniformity in Analysis of Materials for the Portland Cement Industry."

A sample of raw cement mixture, and another of finished Portland cement, was submitted to a number of chemists for analysis, due care being taken in the sampling to ensure that the different samples of each material should be identical in composition. Most of the chemists were connected with the Portland cement industry, and each chemist employed such methods of analysis as he deemed most suitable, but sent a description of the methods used to the Sub-Committee together with the results of his analyses.

The following table shows the extreme differences in the results of the analyses of the raw mixture and finished cement respectively returned by seventeen chemists :—

Cement Mixture.

	Silica.	Oxide of Iron and Alumina.	Lime.	Magnesia.
	per cent.	per cent.	per cent.	per cent.
Maximum	15·75	8·50	41·92	2·14
Minimum	12·78	7·08	39·53	1·10
Difference	2·97	1·42	2 39	1·04

Finished Cement.

	Loss on Ignition.	Silica.	Oxide of Iron and Alumina.	Lime.	Magnesia.	Sulphuric Anhydride.
Maximum.....	3·20	21·56	11·36	64·30	3·15	1·71
Minimum	1·04	19·18	9·32	62·01	2·52	1·30
Difference.....	2·16	2·38	2·04	2·29	0·63	0·41

The results of the analyses, together with the descriptions of the methods used, were sent to Dr. Hillebrand, of the United States Geological Survey, who is a recognised authority on the subject, with the request that he would express his views with regard to the principal sources of error in the work of the chemists, and would suggest a scheme of analysis by which more reliable results could be obtained without prolonging the time occupied for the analysis beyond one working day.

After enumerating the sources of error in the various methods of analysis adopted by the dinerent chemists, Dr. Hillebrand delineates a scheme which he regards as sufficiently accurate for all technical purposes, but admits that it involves extra manipulation. He is of opinion that greater uniformity in the results of analyses cannot be attained without this additional manipulation.

The Report concludes with a detailed "method suggested by Clifford Richardson, for the analysis of limestone, raw mixture, and Portland cement, proposed for trial by the Committee and modified in accordance with the suggestions of W. F. Hillebrand."

The Committee recommends that the samples which it distributed for this investigation be again analysed by the proposed method, and that the results, together with criticisms of the method, be returned to the Chairman of the Committee as soon as possible.

The final results of this investigation will be awaited with interest, but we do not think that cement manufacturers would complain very greatly if the differences in the results of commercial analyses by different analysts never exceeded those quoted in the Report. Unfortunately, analyses of an identical sample of material are sometimes returned by different analysts which exhibit much wider differences.

LADY CHAPEL, BARTON, LANCASHIRE.—A new Lady chapel and sacristies, provided at a cost of 1,000*l.*, have been erected in connexion with All Saints', Barton. The new chapel and sacristies have been designed by Messrs. Pugin & Pugin, London, and built by Messrs. R. Neill & Sons, of Manchester, the altar being the work of M. Charles Bevaert, Bruges; and the triptych carved by M. Lelau Declerk, Courtrai, Belgium, to the design of Mr. Sebastian Pugin-Powell.

AMERICAN WORKSHOP METHODS IN STEEL CONSTRUCTION.

THE following is the abstract of a paper on this subject read at the Institution of Civil Engineers on the 14th inst. by Mr. H. B. Molesworth, M.Inst.C.E.:—

The author, in noticing the fact that many recent contracts for steelwork had been secured by American manufacturers in competition with English firms, suggested that a description of American methods would be advantageous. The quality of American first-class work was excellent, in design, material, workmanship, and finish, and was fully equal to English work. The cost of labour, though higher as regarded the amount earned by individual workmen, was lower than in England when the quantity of work turned out was taken into account. English bridge-works were frequently cramped for room, and hampered with old-fashioned and obsolete machinery, while American works were kept up to modern requirements, and obsolete machinery was turned out as soon as it was superseded by anything more efficient. Works in America usually ran night and day, and American workmen took fewer holidays than English workmen.

The author confined his description to the bridge department of the Pencoyd Works of the American Bridge Company, near Philadelphia, and after giving a general description of the works, traced the material from the bridge-shop yard through the various processes into the loading-up yard, whence it was shipped. The bridge-shop was electrically driven, the cranes and larger machines having each its independent motor. The material was moved longitudinally through the shop on trollies and transversely by electric cranes, the shop was roofed in, and the floor was boarded; the material rested almost entirely on skids, and every process moved it farther along the shop till the finished work emerged at the opposite end to that at which the steel entered. The output in gross tons per man, per annum, averaged :—Draftsmen, 771; bridge-shop, 115; forge, 45; eye-bars, 185; templaters, 2,366.

The steel was open-hearth steel, rather softer than was generally used in England, of excellent quality, and giving very uniform tests. The greatest care was taken to deliver all material into the bridge-shop yard perfectly straightened. The drawings were prepared in a very complete manner, and gave much more information than was usually furnished on drawings in England. Great care was taken to minimise smith's work, and to duplicate as many parts as possible. Stops, guides, automatic spacing punches, and multiple punches were largely used. The angle-shear was used much more than in England, and joists of the largest size were sheared at one cut without any distortion; punches and dies were all made on automatic lathes, and were interchangeable. All the larger shearing-machines were mounted on turntables. Plates were handled under punches by roller frames or goose-necks, and moved by a chisel bar working on a fulcrum. Rimering was done by gantry drills, which resembled a Wellington crane with eight radial drills on it. Pneumatic drills and riveters, and chipping machines of the Boyer type were much used, and bad holes, which were very uncommon, were rimered and not drifted. Ends of long pieces were rimered or drilled by compressed-air drills fed up to the work by a compressed-air cylinder behind them. Large plate-girders were riveted by hydraulic gap riveters mounted on a ram to raise or lower them, the work being suspended from an electric Wellington crane traversed by a switch on the riveter-platform. Ends of members were milled by rotary planers which had heads 4 ft. 6 in. to 6 ft. in diameter, with cutters fixed near the periphery. Angle-stiffeners were bevelled in pairs in a milling machine with fast vertical feed, and fitted perfectly. Large joists or channels were handled with clip-hooks furnished with chisel points.

Very little planing was done in the works; "Universal" plates were used, and were rolled by nearly all American plate-mills without extra charge.

The causes of cheap working in America might be summed up as follows :—

1. The workmen, though more highly paid than in England, turned out a much larger quantity of work.

2. The arrangement of the works was more carefully thought out, and labour-saving appliances were more used.

3. There was more method, and probably more scientific knowledge, in the drawing-office.

4. The works were run night and day.

5. The templating was reduced to a minimum by care in the drawing-office and by the use of automatic machinery and stops and guides.

6. Obsolete machinery was turned out of the works as soon as it was superseded by anything better.

7. All tools were kept in a state of perfect efficiency.

8. Railway freights were lower than in England.

The responsibility for the small output per man in England rested only partially with the manufacturer, who was hampered in every effort to introduce improvements by the action of the workmen. The author suggested improvement on the following lines :—

(*a*) A careful arrangement of works to avoid unnecessary handling and give ample facilities for such as was necessary.

(*b*) More complete drawings.

(*c*) The condemnation and removal of obsolete machinery and the proper maintenance of what was in use.

(*d*) Ample motive power.

(*e*) The more extended use of stops, guides, and multiple and spacing punches.

The saving which was possible by systematic methods in the drawing office, and the use of stops and guides and multiple punches, so as to reduce the templating, was very great. Small portions of the work should be made interchangeable and turned out without having to mark each piece. The use of the spacing-punch obviated the necessity for wooden templates, and for marking.

INSTITUTE OF SANITARY ENGINEERS.

ON the 15th inst. Dr. Thresh, the President of the Institute of Sanitary Engineers, read his opening address, in which he made an interesting summary of the habitual state of town dwellings and streets in what may be called the pre-sanitary epoch, and cited historic evidence of the now almost inconceivable state of filth and unwholesomeness in which people were once content to live, or at all events did live, whether contentedly or not. Even as late as 1842 the Report of the Royal Commission on the Sanitary State of the Labouring Population revealed the most shocking state of things. We have not space to reprint this portion of the address, but it is well that the sanitary condition of many of our towns little more than half a century ago should thus be put on record. Following on this historic portion of his address, Dr. Thresh continued :—

"The year 1842 may be said to have seen the close of the pre-sanitary and the dawn of the sanitary era. In 1844 the Health of Towns Commission presented their report, and in 1848, when another invasion of cholera threatened, the first Public Health Act was passed.

The Town Councils of boroughs were constituted Sanitary Authorities, and local Boards of Health were formed. These authorities were given power to borrow money for works of sewerage and water supply, and also the powers necessary for carrying out such works The Act was, as might be expected, very in adequate and defective, but it had a marvellous effect, and continued in force until the great consolidating and more complete Act of 1875 was passed.

There is one effect produced by the 1848 Act, which, however, must be referred to. Sanitary improvements were urgently needed, and Parliament had given all the powers necessary for raising money, &c., to carry out such improvements; but Parliament could not create sanitary engineers. But the sanitary engineer came into existence. Hitherto there had been no demand for men with such qualifications, and there were few who had had any practical experience in designing or carrying out works of a thoroughly sanitary character. No wonder, therefore, that during the process of evolution many mistakes were made, that much of the work then carried out has since been found to be very defective, and that in many instances one source of danger has been removed by means which introduced another. Sewers were badly constructed and ill-ventilated, drains were improperly laid, inefficiently trapped, the plumbing work was

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especially bad, and water supplies were not adequately protected.

In 1875, the Public Health Act was passed, and the Local Government Board placed in control of sanitary affairs. Improvements have since been effected in nearly every town. Hundreds of systems of sewerage and works of public water-supply have been carried out. The grossly insanitary conditions which existed in nearly all houses have been generally removed. Medical officers of health and sanitary inspectors were appointed to discover defects and suggest remedies, and there is now no lack of sanitary engineers ready to plan and superintend anything, from the drainage and water-supply of a cottage to the sewerage of the largest city, or to the bringing of water from the mountains of Wales to the City of London.

Let us stay for one *minute* to estimate the saving of life effected so largely by the works of the sanitary engineer. The data we require can be obtained from the annual returns of the Registrar-General, and are as follows :—Death-rate per 1,000 population 1841-1850, 22·4 ; 1891-1900, 18·2 ; decrease, 4·2. Estimating the present population of England and Wales at 33,000,000, this decrease represents the saving of 138,600 lives annually, effected almost entirely by the works of sanitary improvement carried out by the sanitary engineers of the past and of the present generation.

In face of this enormous saving of life there are still so-called statesmen who deplore the indebtedness of our sanitary authorities, and call the expenditure of money on sanitary improvements 'unremunerative investments.' Why, gentlemen, no investment is so remunerative. Every right thinking person now accepts the dictum of the late Crown Prince of Austria, "that man is the most precious capital of the State and of society in general. Every individual represents a certain value, and to preserve this as intact as possible, and to its utmost limit, is not only a command of humanity, but also the duty of every community in its own interest." This aspect of the subject is one which has a great fascination for me, but time will not permit me to dwell further upon it.

Much has been done to improve the sanitary condition of the country ; but much more remains to be done. There is still ample work for the sanitary engineer. The gross pollution of air, water, and soil, which was so common half a century ago, is now rarely found ; but such pollution is still going on throughout the length and breadth of the land. We no longer find our towns intersected by open sewers, and fouled by countless heaps of reeking filth, but we have defective sewers polluting the soil, defective drains and sanitary fittings permitting of the pollution of the air, defective methods of excrement and refuse disposal. The danger is not less real because it is concealed. The exigencies of our civilisation, and the consequent growth of towns, the connexion of nearly all houses with sewers and water mains, have introduced fresh elements of danger, and additional problems now await solution. These are so numerous and so important that it is generally admitted our sanitary enactments require revision and codification, and that the whole sanitary administration, to be efficient, should be placed under the control of a special Minister of State.

Of these problems I will only refer to one—the housing of the working classes. The aggregation of the labouring classes in towns is depopulating our rural areas and overcrowding our urban districts, both conditions which are to be deplored, and which sooner or later must be combated if we wish to retain our pre-eminence as a nation.

In the endeavour to improve the housing of the rural labourer many Rural Sanitary Authorities have adopted building by-laws which they find themselves powerless to enforce without preventing the erection of cottages altogether, and thus, by driving the labourers to the towns, making matters worse than before. The so-called model by-laws of the Local Government Board are, generally speaking, excellent when applied to towns, but in many respects they are not adapted to meet the requirements of rural districts. In the former, stability and freedom from risk from fire are of much greater importance than in the latter, and this stability, &c., can only be obtained at a cost which almost prohibits cottage-building in the country. Quite recently the Local Government Board have issued a suggested code of building by-laws for rural districts, which are excellent so far as they go, but they do not go nearly far enough, inasmuch as the Authorities adopting them have no control whatever over the nature of the material of which the buildings are to be constructed, their proximity to other buildings, &c. A builder might put up a whole row of wooden or lath-and-plaster cottages, and in such a manner that if one caught fire the whole lot would inevitably be consumed, and of such a flimsy character that all of them in a few years would become unfit for human habitation.

I mention these by-laws because I wish to suggest that this Institute should consider the subject, with the object of improving those devised by the Local Government Board. If a suitable series could be devised they would be largely adopted, and the country generally be benefited thereby. I should also suggest, as many other associations are greatly interested in this matter, that they should, at a later stage, be invited to co-operate with our Institute.

Work of this character would not only benefit the public, but also indirectly the Institute, and there is no dearth of such subjects which you might with advantage consider. If the Institute is to flourish it must make its existence known outside its own circle of members, and endeavour to obtain a reputation for doing good work. Amongst its Fellows there are many who have acquired special knowledge—knowledge not only of value to their fellow-members, but interesting to the community at large. An organisation such as this, especially if working in accord with kindred associations, should exercise a great influence in any future legislation of a sanitary character. I should like to see such influence secured, so that the opinions of the Institute should be desired, and be always treated with respect.

Progress must be our watchword. The sanitary millennium is not yet. From time to time some definite object should be selected for consideration, and the whole interest of the Institute be centred upon it, so that no session shall pass over without some good work being accomplished. Do not be too ambitious, but be ambitious enough. Enthusiasm in the Council and officers will beget enthusiasm in the Fellows and members, and each step forward will render further progress less arduous. Above all things, we must remember that we are not working for ourselves alone. Selfishness never leads to ultimate success. Our success will be proportionate to our forgetfulness of our individual interests and our acknowledgment of the paramount claims of sanitary progress—a progress which benefits the whole human race."

At the close of the address Mr. E. D. Cecil proposed a vote of thanks to the President for his interesting and suggestive *résumé* of the history of sanitary reform. As a footnote to the first part of the address he mentioned that in the conflict between Paganism and Christianity the unfortunate idea had prevailed that, as the Pagan civilisation included scrupulous cleanliness, and as nothing Pagan could be good, therefore somehow dirtiness was Christian. In reference to the interesting series of reports of fifty or sixty years ago, from which Dr. Thresh had given extracts, he remarked that some of the conditions therein revealed came down to a much later date, as was strikingly proved by the state of Marlborough House, which caused the nearly fatal illness of the present Sovereign, for the whole basement was found saturated with sewage, which had been soaking into the soil and never getting away further for many years previously.

Mr. H. M. Dove, in seconding the resolution, trusted that the Institute would take up such questions as building by-laws and the housing problem, and make its influence felt in the public discussions of those important matters, bearing in mind that their aims should not be selfish, but for the benefit of the community at large.

The Chairman referred to several of the towns which had been mentioned by Dr. Thresh, and especially to the continued erection of large numbers of back-to-back houses in Leeds, in spite of their almost universal condemnation as unhealthy and indecent. Mr. Spinks gave startling illustrations of the evils connected with building blocks of eight houses each, with privies common to all, and said he felt surprised that Dr. Thresh should have left Yorkshire while there was still such urgent need of sanitary reform there. He congratulated the Institute on its new President, and the President upon that encouraging meeting.

THE BUILDERS' FOREMEN'S ASSOCIATION.

THE annual dinner of the Builders' Foremen's Association took place on Saturday at the Holborn Restaurant. In the absence of Mr. J. C. Hill, through a family bereavement, the chair was taken by Mr. G. H. Cakebread. The guests numbered 214, among whom were Messrs. H. J. Strong, G. Thomson, B. Carter, W. Salter, A. J. Arnold, E. Arnold, F. W. Stevenson, A. Bailey, Coxon, Spencer Green (President of the Clerk of Works Association), Gathercole, and Soall.

The Chairman, in proposing "The Builders' Foremen's Association," said they all sympathised with Mr. Hill in the loss he had that day sustained by the death of his mother. Mr. Hill regretted very much that he was unable to preside, but he wished to intimate that he intended to become a life member of the Association. Societies, continued Mr. Cakebread, like this Association were bound to elevate and improve the building trade, and deserved great success.

Mr. H. J. Strong (the President), in response, said the object of the Association was to promote the interests of those engaged in the control and supervision of building and kindred works, by providing a central place where meetings and discussions could take place from time to time on matters of interest to the building and allied trades. A benevolent fund was connected with it, for the assistance of those in distress, and 10*l*. was paid on the death of a member. It was now about nine years since the Association was started. It commenced in a very small way, but the membership was now ninety. They had paid 100*l*. in cases of need, and 160*l*. was invested.

Mr. G. Thomson submitted "The Building Trades." He said that in making a retrospect of the past year they could not report great prosperity. From various causes 1901 had proved much worse than some preceding years. It was remarked by some people that there was a slight falling-off in trade after a few years of successive prosperity—that that was the rule—and the building trades had just passed through a lean year. One of the forces to mitigate against good trade was the long duration of the war in South Africa. He looked forward with hope, after this war was ended, to see the trade of the country reviving to a considerable extent. They read in some newspapers that trade was altogether going from this country. He could not go so far as to say that, because the country still retained pre-eminence in many departments of commerce. However, there was great need for their Association and similar societies to watch the movements of their opponents in Europe and America, and to do all they could to further the interests of British trade, and to do all in their power to retain the pre-eminence of British manufacturers.

Mr. Carter, in reply, said he was pleased to see that this Association was prospering. The employers in the building trades took a keen interest in their foremen, and were glad to see that among other things they had started a benevolent fund.

Toasts to the chairman and visitors concluded the proceedings.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting on January 15, Dr. W. de Gray Birch, hon. treasurer, in the chair, Mr. Forster exhibited a massive piece of lead, the filling of an iron cramp recently taken from the masonry of the remains of the old Roman bridge at Corbridge, in perfect condition. The chairman exhibited a cast of the seal of the City of Canterbury, having reference to Thomas à Becket, also casts of two impressions of the Great Seal of Queen Elizabeth for the Kingdom of Ireland, which, he believed, were as yet unknown and had never been figured. One was from a detached impression on a vellum label cut from a document. The other was attached to a document dated February, 15[illegible] the fifth year of the Queen's reign ; they are of dark yellow or uncoloured wax. The Rev. H. J. D. Astley exhibited, on the part of the Rev. Caesar Caine, a rubbing of a small coffin-shaped stone slab recently discovered in the church of Garrigill bearing a pair of shears in the centre, probably being the memorial of a shearman or woolstapler. The paper of the evening was read by the Rev. C. H. Evelyn-White upon the "Boy Bishop," a subject out of the

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scope to report, as it is a part of religious and social history rather than of archæology. In the course of the paper, allusion was made to the money struck for the Boy Bishop (St. Nicholas' pence), of which several English varieties are known, as well as the Continental "Monnaies des Evêques des Innocens."

WILTSHIRE ARCHÆOLOGICAL SOCIETY.—A special general meeting of the members of the Wiltshire Archæological and Natural History Society was held on the 16th inst. at the Society's Museum, at Devizes. The business laid before the meeting by the hon. secretaries, Mr. H. E. Medlicott and the Rev. E. H. Goddard, was:—"To consider, and if approved, to give effect to provisional contracts entered into, and now recommended for adoption by the Committee, involving the purchase of land and buildings adjoining the Museum with a view to the further extension thereof; also the alienation, subject to covenants for the protection of Museum buildings, of a portion of the land so acquired and other adjoining land already vested in the Society's trustees." A long discussion ensued on these proposals, one or two present advocating the removal of the Museum to Salisbury or Swindon, but in the end the resolutions were carried. Steps were taken for making an appeal for such fund as might be required for the purpose of extending the Museum. A resolution was cordially adopted thanking Sir Edmund Antrobus for the careful and able manner in which he had carried out the restoration at Stonehenge by replacing the leaning stone, &c., thus preserving the ancient monument from further decay and demolition.

THE LONDON COUNTY COUNCIL.

THE first meeting of the London County Council after the Christmas recess was held on Tuesday, at the County Hall, Spring-gardens, S.W., Mr. A. M. Torrance, (Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Greenwich Borough Council, 3,200*l.* for the purchase of land for a depot; Shoreditch Borough Council, 14,600*l.* for alteration of offices; Woolwich Borough Council, 8,500*l.* for the erection of lodging-houses for the working classes; Islington Borough Council, 1,700*l.*, 4,125*l.*, and 2,595*l.* for electric light installation; Kensington Borough Council, 23,429*l.* for contribution to street improvement; Westminster City Council, 82,930*l.* for paving works; Battersea Borough Council, 7,500*l.* for erection of baths and washhouses; Fulham Borough Council, 15,000*l.* for erection of baths and washhouses; Fulham Guardians, 1,060*l.* for provision of lavatory accommodation at the workhouse; Shoreditch Guardians, 4,930*l.* for various purposes; Wandsworth and Clapham Guardians, 4,150*l.* for erection of cottage homes; School Board for London, 162,931*l.* for schools, &c.; Metropolitan Asylums Board, 223,970*l.* for various purposes; and Greenwich Borough Council, 3,930*l.* for paving works.

Cross River Traffic, Woolwich.—Mr. Squires presented a petition, signed by over 13,000 inhabitants of Woolwich, who asked that means of traffic across the river at that place should be improved at an early date. The petition was referred to the Bridges Committee.

Technical Education.—The same Committee recommended and it was agreed, after discussion:—

"That, considering that the Council has received requests from the managers of various schools and institutions in the administrative county of London to make provision in aid of technical or manual instruction within the county, the sum of 90,000*l.*, being part of the moneys received by the Council under Sub-section 1 (*b*) of Section 1 of the Local Taxation (Customs and Excise) Act, 1890, in respect of the financial year ending March 31, 1902, be, and the same is hereby appropriated for the purposes of technical or manual instruction within the meaning of the Technical Instruction Acts, 1889 and 1891."

Tenders.—The following tenders have been accepted:—

Engineering tools and sundries, Horton Asylum: Messrs. Mosers, Ltd., 140*l.* and 248*l.*

Electric Lighting, Farmfield (Wiring, &c.): The Anti-Vibrator, Ltd., 450*l.*

Fire-station, Homerton.—The Fire Brigade Committee reported that Messrs. Martin, Wells, & Co., the contractors for the erection of the sub-station at Homerton, had asked permission to sub-let the tiling and slating and the hot-water work to firms of whom the architect approves. The Committee were of opinion that the request should be complied with, and they recommended that Messrs. Martin, Wells, & Co. be allowed to sub-let to Messrs. J. William & Co. the tiling and slating, and to Messrs. G. & E. Bradley the hot-water work at the Homerton fire-station; that the Solicitor do prepare the agreement prescribed by the Council's standing orders with regard to sub-letting.

The recommendation was agreed to.

Tramways.—The meeting was made special, and the necessary resolutions were passed for the purchase of the undertaking of the South-Eastern Metropolitan Tramways Company. The cost to the Council will be 51,000*l.*, and, by a small junction line, cars will be able to run to Rushey-green.

Replying to Mr. Bruce, Mr. Benn said notice had been served on the North Metropolitan Tramway Company to electrify their lines, and they were awaiting a reply as to the best means by which this could be done. They would do all they could to induce the North Metropolitan Company to resume the all-night service.

Cottages, Deptford.—The Housing of the Working Classes Committee reported as follows, the recommendation being agreed to:—

"On December 17, 1901, the Council entrusted to the manager of works the work of erecting the lodging-house to be built on the larger portion of the area cleared under the Mill-lane scheme, Deptford. As we intimated in our report on that date, the remainder of the site will be devoted to the erection of twenty-four cottages. Each cottage will be self-contained, and will consist of living room, scullery, water-closet, and two bed-rooms, with a small garden in rear, and accommodation will be provided for 144 persons. In view of the fact that the manager of works was undertaking the building of the lodging-house we referred to him the plans and estimate for the cottages also. He has now reported that he is not prepared to undertake the work of building them at the amount of the architect's estimate. We think, therefore, that tenders should be invited from a selected list of firms. We submit the working drawings, bills of quantities, and specification in respect of the cottages, but do not at the present stage desire that the estimate should be made public. The Council will incur no liability by authorising us to invite tenders as we propose, and the estimate will be put forward after receipt of the tenders and before any liability is incurred. We recommend—That the working drawings, bills of quantities, and specification in respect of twenty-four cottages to be erected on a portion of the area comprised in the Mill-lane scheme, Deptford, be approved, and that the Housing of the Working Classes Committee be authorised to invite tenders for the erection of the cottages from a list of selected firms."

Housing Scheme, Russell-court, Drury-lane.—The same Committee reported as follows:—

"We submit working drawings, bills of quantities, and specification in respect of Siddons and Stirling-buildings, Russell-court, Drury-lane. These buildings are to be erected for the accommodation of persons displaced by the carrying into effect of the Clare Market scheme. They consist of five-story buildings, and will provide accommodation for 390 persons in ten tenements of one room, thirty tenements of two rooms, thirty-five tenements of three rooms, and five tenements of four rooms. We have considered the question whether these buildings should be referred to the manager of works or whether tenders should be invited for them, and we are of opinion that a selected list of contractors should be requested to submit tenders. As in the case of the Mill-lane cottages, we do not desire to disclose the amount of the estimate at the present stage, but no liability will be incurred by the Council in adopting the course we advise, and an estimate is not necessary till after the receipt of the tenders. We recommend—That the working drawings, bills of quantities, and specification in respect of Siddons and Stirling-buildings, Russell-court, Drury-lane, be approved, and that the Housing of the Working Classes Committee be authorised to invite tenders for the erection of the buildings from a list of selected firms."

Improving Piccadilly.—Mr. Emden asked whether the Improvements Committee were considering the question of improving Piccadilly westwards.

Mr. Goodman, in reply, said the matter was on the Agenda, but it depended a great deal on the sympathy which would be shown towards the Committee by the freeholders and leaseholders.

The Opening-up of Roads.—On the motion of Mr. Foster, it was agreed:—"That in consequence of the growing evil, resulting in loss of life and injuries to persons, damage to business, and danger and delay to vehicular traffic caused by the frequent and continuous opening of roads, it be referred to the Highways Committee to consider and report as to the best means for the Council to procure such statutory powers as to secure that all persons or companies having Parliamentary powers to open the roads shall be compelled to give adequate notice to the Council before exercising such powers, and that the Council shall have the power to make such regulations and have such supervision as will ensure such work being done expeditiously, and with full regard to the public safety and business interests."

Relief of Traffic.—On the motion of Captain Swinton, it was agreed:—"That, having regard to the fact that the traffic in main thoroughfares becomes daily more congested, and that such congestion, though assisted by the mixture of slow and fast draught and the narrowness of the streets, is even more certainly caused by cross traffic, it be an instruction to the Improvements Committee to consider the possibilities of some 'over and under' arrangement, by means of bridges or subways, in or about every spot where two large streams of vehicles have now perforce to wait to cross each other."

Inspection of Kitchens.—On the motion of Mr. Foster, it was agreed:—"That considering the thousands of persons in London whose business compels them to have the greater part of their food in public restaurants and eating-houses, and in view of the great importance to the public health that such food should be prepared in wholesome and sanitary surroundings, it be referred to the Public Health Committee to consider and report as to the best means to exercise periodical inspections of the kitchens of restaurants and eating-houses, on similar lines as bakehouses and factories are inspected."

The Council adjourned at seven o'clock.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. Unless otherwise stated, consent was given on conditions. The names of applicants are given between parentheses:—

Lines of Frontage and Projections.

Strand+—Four two-story oriel windows and three balconies on the eastern front and two balconies on the northern front of a block of buildings to be erected on the site of No. 30, Bury-street, and Nos. 19 and 21, Ryder-street, St. James's (Mr. R. J. Worley for Mr. J. Beale).—Consent.

Hammersmith.—A one-story addition on part of the forecourt of No. 160, Goldhawk-road, Shepherd's Bush (Mr. C. G. Baker for Dr. A. Woodforde).—Consent.

Paddington, North.—Balconies at the first, second and third floor levels in front of a block of residential flats on the south-east side of Elgin-avenue, Paddington, at the corner of Biddulph-road (Messrs. Boehmer & Gibbs for Mr. H. C. C. Shaw).—Consent.

Poplar.—A theatre building on the north side of East India Dock-road, Poplar, abutting upon Stainsby-road and Canton-street (Messrs. Owen & Ward for the Eldorado Theatre, Limited).—Consent.

Clapham.—A turret, to be constructed of wood covered with lead, on the roof of a house on the north side of Battersea-rise, Battersea, at the corner of Limburg-road (Mr. G. E. Nield for Mr. W. J. Vokes).—Consent.

Clapham.—A two-story oriel window at the first and second floor levels in front of a house on the north side of Battersea-rise, westward of Limburg-road (Mr. G. E. Nield for Mr. W. J. Vokes).—Consent.

Hampstead.—Two-story bay-windows to two dwelling houses on the north side of Finchley-road, Hampstead, between Heath-drive and Frognal-lane (Messrs. Davis Brothers).—Consent.

Hampstead.—The retention of a fodder-store and the erection of a tool-shed at Cranbrook stables, Nutley-terrace, Hampstead (Messrs. White & Page for Mr. J. Duveen).—Consent.

Horton.—An iron and glass shelter over the entrances to the London Music-hall, High-street, Shoreditch (Mr. F. Matcham for the London Music Hall Company, Limited).—Consent.

Lewisham.—That the application of Mr. J. W. Brooker for an extension of the period within which the erection of six houses on the east side of Brockley Rise, Lewisham, at the corner of Brockley Park, was required to be commenced be granted.—Agreed.

Marylebone, East.—A bay window in front of No. 75, Welbeck-street, St. Marylebone (Mr. F. M.

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Elgood for Messrs. Debenham & Freebody).—Consent.

Peckham.—A one-story shop on part of the forecourt of No. 24, Gibbon-road, Nunhead (Mr. J. Sykes).—Consent.

St. George, Hanover-square.—An oriel window at the first, second, third, and fourth-floor levels, with a turret over, in front of Nos. 24 and 25, Princes-street, St. George, Hanover-square (Messrs. W. G. Bartleet & Son for Messrs. H. G. Porter & Co.).—Consent.

St George, Hanover-square.—That the application of Messrs. C. Mellier & Co. on behalf of Mr. G. D. Faber, M.P., for an extension of the period within which the erection of a stone portico at the entrance to No. 14, Grosvenor-square, St. George, Hanover-square, was required to be commenced, be granted.—Agreed.

Wandsworth.—A house and a stable building on a site on the west side of Marlborough-road, Putney, to abut upon Bramcote-road (Mr. J. C. Radford for Mr. C. Merrett).—Consent.

Wandsworth.—Nineteen houses on the south side of Grove-road, Balham, westward of a house known as Ravenscroft (Mr. P. Dollar for Messrs. Pickford, Limited).—Consent.

Wandsworth.—Buildings, with one-story shops in front, on the site of Russell House, and the rebuilding of Nos. 122 and 132 (even numbers only), Balham-high-road, Balham (Messrs. Bourchier, Burmester, & Galsworthy for Mr. J. W. Holdron).—Consent.

Westminster.—A one-story shop and porch, on part of the forecourt in front of No. 119, Victoria-street, Westminster (Mr. B. Woollard for Mr. J. Browne-Martin) —Consent.

Lewisham.†—Bay windows in front of Nos. 9, 11, 13 and 15, Dowanhill-road, Catford (Mr. G. Tolley for Mr. A. C. Corbett, M.P.).—Refused.

St. Pancras, North.—The retention of balconies on the first, second and third floor levels in front of Nos. 21, 22, 23, and 24, Lissenden-gardens, Highgate (Messrs. Boehmer & Gibbs for Mr. A. W. Armstrong).—Refused.

Battersea.—A one-story addition to the National Anti-Vivisection Hospital, Prince of Wales-road, Battersea (Mr. A. Parnacott for the Board of the hospital).—Refused.

Battersea.—The rebuilding of Nos. 117 and 119, Plough-road, Battersea (Mr. W. C. Poole for the Dairy Supply Co., Ltd.).—Refused.

Brixton.†—A three-story addition to the Stockwell Training College on the north-east side of Stockwell-road, Brixton (Mr. J. O. Smith for the British and Foreign School Society).—Refused.

Hammersmith.—Residential flats, with projecting bay-windows, on the south side of Askew-road, Shepherd's Bush, eastward of Ashchurch-road (Messrs. Richardson & White for Mr. J. C. Edwards).—Refused.

Islington, North.—One-story addition on the north side of No. 122, Dartmouth Park-hill, Islington, to abut upon Langdon-road (Mr. R. Midworth for Mr. F. Bryen).—Refused.

Lewisham.†—Iron porches with zinc or tiled roofs at the entrances to proposed houses on the Old House Estate, Sydenham (Messrs. I. Edmondson & Son for Mr. J. Edmondson).—Refused.

Marylebone, West.—Wood and glass enclosures to a stone portico at the entrance to No. 54, Great Cumberland-place, Hyde Park (Mr. M. Macartney for Mr. V. T. T. Francis).—Refused.

Marylebone, West.—A signboard in front of the Oxford Stores public-house, No. 418, Oxford-street, St. Marylebone (Messrs. J. & H. Cocks, Limited, for Messrs. Worthington & Co., Limited).—Refused.

Norwood.—A one-story warehouse on the north side of Park-road, West Norwood (Mr. H. Bignold for Messrs. F. Vincent & Sons).—Refused.

Strand.—Signboard in front of the Windsor public-house, No. 427, Strand (Messrs. J. & H. Cocks, Limited, for Messrs. Worthington & Co., Limited).—Refused.

Strand.—A signboard at the second-floor level in front of No. 18, Cockspur-street, Strand (Messrs. Norman & Stacey, Ltd.).—Refused.

Width of Way.

Norwood.—The retention of a one-story building at the rear of No. 6, Gloucester-street, West Norwood, with the external fence of the space between the external walls of the building and Beadman-street at less than the prescribed distance from the centre of that street (Mr. C. Austin).—Consent.

Westminster.—A new roof to form an additional story to Nos. 32 and 34, Great Peter-street, Westminster, at the corner of St. Ann's-lane (Messrs. Wake & Co. for Messrs. Wilson & Pilcher, Ltd.).—Consent.

St. George-in-the-East.†—Twenty houses in Samuel-street, James-street, Langdale-street, and William-street, St. George-in-the-East, and the widening of those streets (Mr. H. H. Collins for Messrs. N. & R. Davis).—Consent.

Hammersmith.—That the Council do make no order with respect to the application of Mr. E. M. Bowyer on behalf of the Kensington Model Laundry, Ltd., for consent to the erection of an additional story on a stable building at the laundry premises, Railway-approach, Goldhawk-road, Shepherd's Bush.—Agreed.

Rotherhithe.—An addition to an engineer's shop at the Princes Dry Dock, Rotherhithe-street, Rotherhithe (Mr. E. C. Homer for the Princes Dry Dock Co.).—Refused.

Space at Rear.

Fulham.—A modification of the provisions of Section 41 (1) (vi.) of the Act with regard to open spaces about buildings so far as relates to the erection of a two-story building, being No. 1, Queensmill-road, Fulham Palace-road, Fulham, with an irregular open space at the rear (Messrs. Allen & Norris).—Consent.

Whitechapel.—A modification of the provisions of Section 41 (1) (vi.) of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of a dwelling-house on the east side of Tenter-street East, Whitechapel, with an irregular open space at the rear (Messrs. N. and R. Davis).—Consent.

Deviations from Certified Plans.

Finsbury, Central.—Deviations from the plans certified by the District Surveyor, under Section 43 of the Act, so far as relates to the proposed re-erection of the Angel Hotel, on the north side of Pentonville-road, Clerkenwell, at the corner of High-street (Messrs. F. J. Eedle & Meyers for Messrs. Truman, Hanbury, Buxton & Co., Ltd.).—Consent.

Width of Way, Lines of Frontage and Projections.

Marylebone, West.—A one-story stable building and of an addition to a studio at No. 16, Grove-end-road, St. John's Wood, to abut on Elm-tree-road, with the external walls of such stable building and addition at less than the prescribed distance from the centre of Elm-tree-road (Mr. J. W. Simpson for Mr. E. C. Stewart).—Consent.

St. George, Hanover-square.—Three two-story bay windows in front of a proposed extension of the Berkeley Hotel, on the east side of Berkeley-street, Piccadilly (Mr. W. H. Lees for the Berkeley Hotel Co.) —Consent.

Brixton.—Deviation from the plan sanctioned on April 30, 1901, for the erection of a block of residential flats on the site of Nos. 400 and 402, Coldharbour-lane, Brixton, so far as relates to the construction of a mansard roof with two dormer windows at such premises (Mr. F. A. Powell for Mr. A. G. H. Brown).—Consent.

Strand.—The retention of stone balconies on the first and second floor levels in front of an addition to the Hotel Dieudonné, Ryder-street, St. James's (Mr. W. Woodward for Mr. Gulfanti).—Consent.

Dulwich.—Three houses, with shops on the ground floor, on the west side of Grove-lane, Camberwell, at the corner of Champion-grove (Mr. J. Heath for Mr. T. Freeman).—Refused.

Lines of Frontage and Space at Rear.

Wandsworth.†—Four houses on the north side of Replingham-road, Southfields, eastward of Wimbledon Park-road, with one-story shops in front and irregular open spaces at the rear (Mr. D. Matthews for Mr. G. A. Gale).—Refused.

Kensington, South.†—Seven one-story shops on the south side of Pembroke-road, Kensington, to an advanced line of frontage, and the erection of residential flats on the west side of Cromwell-crescent, with irregular open spaces at the rear (Mr. P. E. Pilditch for Messrs. J. Barker & Co., Ltd.).—Refused.

Projection and Construction.

Lewisham.†—A wood and glass pent in front of a stable at Woodthorpe, Beckham-lane, Beckenham (Mr. C. Sargent for Mr. F. Simonds).—Refused.

Formation of Streets.

Lewisham.†—That an order be issued to Messrs. Norfolk & Prior, sanctioning the formation or laying out of a new street for carriage traffic out of the east side of Ravensbourne Park, Catford, and in connexion therewith the widening of a portion of Ravensbourne Park (for Mr. J. Barlow).—Consent.

Wandsworth.—That an order be issued to Mr. A. W. Iles, sanctioning the formation or laying out of a new street for carriage traffic to lead from Garratt-lane to Wimbledon-road, Summers-town, Wandsworth, and in connexion therewith the widening of a portion of Garratt-lane. That the name Keble-street be approved for the new street.—Agreed.

Fulham.—That an order be issued to Mr. T. V. Smith and to Messrs. W. & A. Atkinson, sanctioning the formation or laying out of three new streets for carriage traffic out of Fulham Palace-road and Brandenburgh-road, Fulham. That the names Rannoch-street, Lochaline-street, and Parfrey-street be approved for the new streets.—Agreed.

Lewisham.†—That an order be issued to Mr. J. W. Webb, sanctioning the formation or laying out of new streets for carriage traffic on part of the Crofton Park Estate, on the eastern side of Crofton Park-road, Brockley. That the names Stillness-road (in continuation), Bexhill-road, Salehurst-road, Ticehurst-street, and Rolvenden-street, be approved for the new streets.—Agreed.

Islington, North.—That an order issued to Messrs. C. Bell, Withers, & Meredith refusing to sanction the formation or laying out of a new street for carriage traffic to lead out of the south-west side of Highgate-hill, Islington (for M. G. H. Schofield).—Agreed.

Woolwich.—That an order be issued to Mr. J. O. Cook refusing to sanction the formation or laying out of a new street for carriage traffic to lead from Woolwich-road to Wrekin-road, Plumstead (for Mr. W. G. Dawson and Mr. J. Harper).—Agreed.

Artisans' Dwellings.

Finsbury, East.—That the Council do make an order as follows: Whereas Mr. R. Robertson, on December 20, 1901, under the provisions of Section 42 of the London Building Act, 1894, delivered on behalf of the Housing of the Working Classes Committee of the Council, at the County Hall, plans of two blocks of intended dwelling-houses, to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site at the rear of houses in Old-street, George-street, and Mitchell-street, Finsbury. . . . Now the Council does by this order sanction the said plans so far as Section 42 of the said Act is concerned. . . .—Agreed.

Rotherhithe.—That the Council do make an order as follows: Whereas Mr. R. Robertson, on December 21, 1901, under the provisions of Section 42 of the London Building Act, 1894, delivered on behalf of the Housing of the Working Classes Committee of the Council, at the County Hall, plans of a block of intended dwelling-houses (to be known as Sandwich-buildings), to be inhabited by persons of the working class and proposed to be erected, not abutting upon a street, on a site on the western side of Swan-lane, Rotherhithe, at the corner of Kenning-street. . . . Now the Council does by this order sanction the said plans so far as Section 42 of the said Act is concerned. . . .—Agreed.

Means of Escape from Top of High Buildings.

St. George, Hanover-square.—Means of escape in case of fire, proposed to be provided in pursuance of Section 63 of the Act, on the seventh and eighth stories of an addition in Berkeley-street to the Berkeley Hotel, Piccadilly, St. George, Hanover-square (the upper surface of the floors of which stories will be above 60 ft. from the street level) for the persons dwelling or employed therein (Mr. W. H. Lees for the Berkeley Hotel Co.).—Consent.

St. George, Hanover-square.—Means of escape in case of fire, proposed to be provided in pursuance of Section 63 of the Act, on the eighth story of the northern portion of a block of residential flats on the west side of Harewood-place, Oxford-street, St. George, Hanover-square (Mr. P. Hoffmann for Mr. H. Lovatt).—Refused.

Buildings for the Supply of Electricity.

Marylebone, West.—Building for the supply of electricity, proposed to be erected on the site of Nos. 35, 36, and 37, North-street, St. Marylebone (Mr. W. H. White for the Metropolitan Electric Light Supply Co., Ltd.).—Consent.

Cubical Extent.

Fulham.—The erection on the south-eastern side of Townmead-road, Fulham, and abutting upon the river Thames, of a building to exceed in extent 250,000, but not 450,000 cubic feet, and to be used only for the purposes of the manufacture of steam-engines and foundry-work (Messrs. Masson, Scott, & Co., Ltd).—Consent.

Hackney, North.—The erection on a site on the west side of Tyssen-street, Dalston-lane, Hackney, at the corner of Tyssen-passage, of one division (known as Block 2), of a factory building, to exceed in extent 250,000, but not 450,000, cubic feet, and to be used only for the purposes of a cabinet and joinery works (Mr. E. O. Sachs for The Shannon, Limited).—Consent.

Height of Building.

Finsbury, Central.—A building on plot No. 42 of the Council's land in Rosebery-avenue, to abut upon Garnault-mews (Mr. L. Solomon for Major Arnold).—Refused.

Height of Building and Construction.

Bermondsey.—A water-tower by the raising of the enclosing walls of a staircase between the north and west wings at Grange Mills, Grange-road, Bermondsey, which tower would exceed 80 ft. in height, and the walls of which would be of less thickness than required by the Act (Messrs. Gordon & Gunton for Messrs. Ross & Co.).—Refused.

*** *The recommendations marked † are contrary to the views of the local authorities.*

BUSINESS PREMISES, ABERDEEN.—A new block of buildings has been erected at 369, Union-street, for Messrs. J. & A. Ogilvie. The architect is Mr. W. Kelly, and the contractors:—Mason work, Mr. Alex. Cheyne; joiner work, Messrs. Hendry & Keith; plasterers, Messrs. Scott & Son; iron beams, Messrs. Abernethy & Co.; slater, Mr. Forbes Morrison; plumber, Mr. A. B. Robertson; painter, Mr. John White; electrical engineer, Claud Hamilton, Ltd.; elevator arrangements, Otis Co.; heating, Messrs. M'Kenzie & Moncur, Edinburgh. The shop fittings were carried out by the workmen employed by Messrs. J. & A. Ogilvie.

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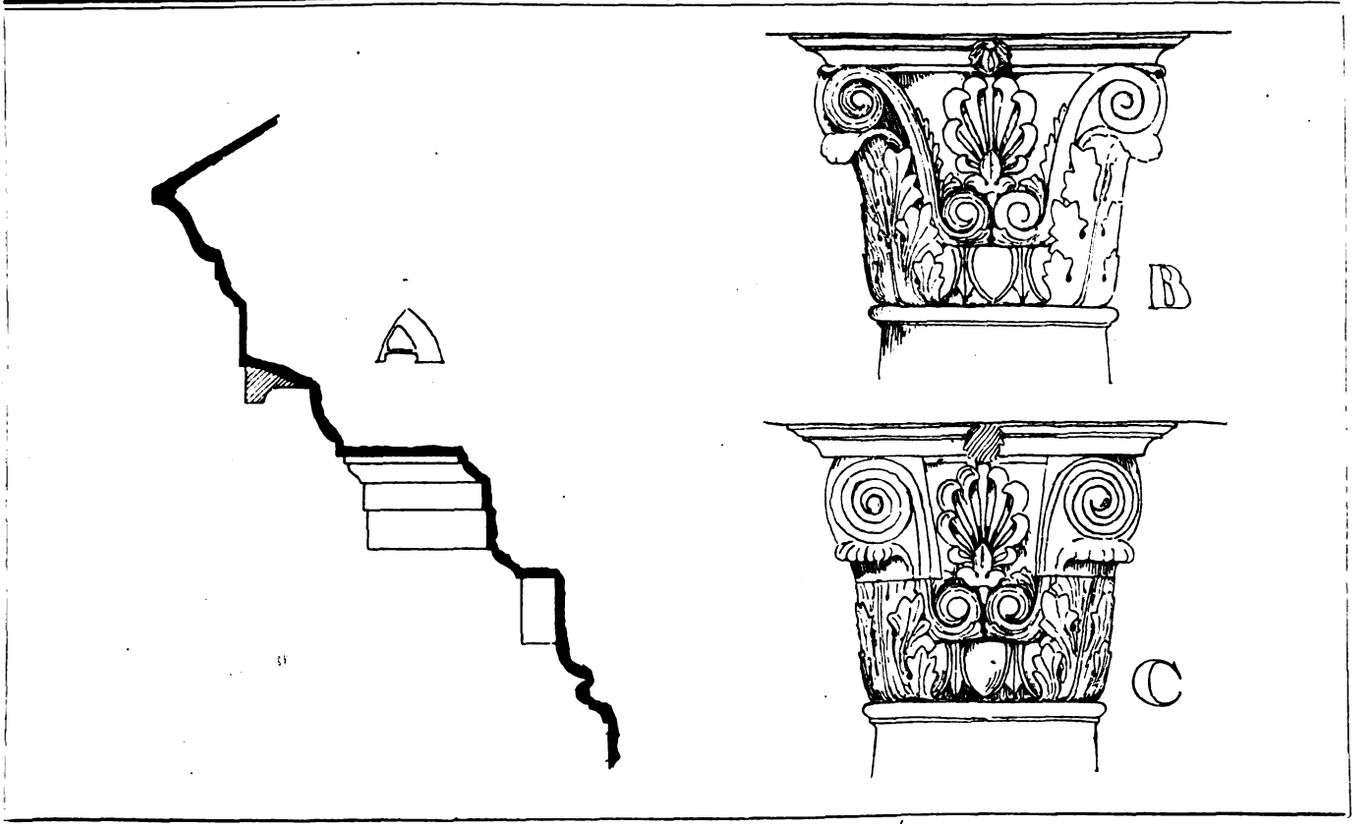

BOOKS RECEIVED.

THE STORY OF ARCHITECTURE, By P. Leslie Waterhouse. (Geo. Newnes. 1s.)

THE YEAR'S ART: 1902. Compiled by A. C. R. Carter. (Virtue & Co.)

WATER AND ITS PURIFICATION. By Samuel Rideal, D.Sc. (Crosby Lockwood & Son. 9s.)

WELL-BORING: FOR WATER, BRINE, AND OIL. By C. Isler. (E. & F. N. Spon.)

THE LAW RELATING TO FACTORIES AND WORKSHOPS. By Evans Austin. Second Edition. (Knight & Co.)

ELECTRIC WIRING AND FITTING. By C. V. Drysdale. (R. J. Bush. 3s.)

A DICTIONARY OF ARCHITECTURE AND BUILDING. By Russell Sturgis, A.M., Ph.D., and others. Third and concluding volume. (Macmillan & Co.)

PRACTICAL EXERCISES IN MAGNETISM AND ELECTRICITY. By H. E. Hadley, B.Sc. (Macmillan & Co.)

SANITARY ENGINEERING: A PRACTICAL MANUAL. By Francis Wood, A.M.Inst.C.E. (Charles Griffin & Co. 8s. 6d.)

Correspondence.

LIVERPOOL CATHEDRAL.

SIR,—I will respect Mr. Scott's desire that no further questions should be asked of him, but it is necessary for me to make some observations upon his letter, lest a false impression should arise were I not to do so.

Mr. Scott may or may not be right in thinking I have "not given much study to the St. James's Mount site." It is all a question of degree. But at least I seem to have given more study than Mr. Scott has done, for I presume he will not intentionally overstate or understate the measurements which appear in his letter, as for instance the following, viz.: (*a*) the belt of cemetery is only about 23 ft. wide, and not "some 30 ft. wide."

(*b*) The drop beyond the terrace wall is about 8 ft., and not about 6 ft.

(*c*) The path beyond the terrace wall is about 12 ft. wide, and not about 15 ft. wide.

(*d*) The "rapid fall" of ground begins at about 37 ft. from the more southerly part of the site, and at about 14 ft. from the more northerly part of the site, and not at about 45 ft., as Mr. Scott describes it; whilst the "cemetery proper" commences immediately adjoining the site, and not, as Mr. Scott describes it, beyond the "rapid fall."

(*e*) The so-called "upper terraces" are all part of the "cemetery proper," and are very fully occupied by graves, and there are not therefore "about 40 ft." of "upper terraces" available for building purposes; and, moreover, the unstable nature of the "terraces" would in any case necessitate their removal to the depth of the lower part of the cemetery, about 45 ft. to 50 ft. below the proposed site, were it desired to erect a massive building upon the site of them.

(*f*) I never stated that "the cemetery dropped 40 ft. to 50 ft. immediately beyond the boundary of the site."

As regards the numbered clauses of Mr. Scott's letter, I have to remark:—

1. That the cost of the foundation works at St. James's Mount site is estimated to be far in excess of additional land which might be required in the vicinity of Monument-place site, even "at a price!"

2. The tram lines would not be nearer to the Cathedral were it built on Monument-place site than they now are to St. George's Hall.

6. In Mr. Scott's letter in your issue of the 4th inst. he wrote, "the site is very open as your plan shows, the cemetery running the whole length of it to the east, while there is ample space to the north and south;" and I leave it to your readers to judge whether my question, No. 6, is not a fair one to ask, even in the light of Mr. Scott's subsequent letter, and to say whether they do not think that every one who had not actually seen the site would suppose, from Mr. Scott's earlier observations, that the cemetery and the site were upon the same level. The remainder of this clause I have dealt with above.

8. Mr. Scott did not previously exclude "solid shop property" from the influence of a Cathedral; but, in any case, Monument-place site is not "a district of solid shop property."

The remaining clauses either "beg the question" or support the views of the Petition Committee, and do not therefore require comment from me.

T. MYDDELTON SHALLCROSS,
Hon. Sec. *pro tem.*
Liverpool Cathedral Petition Committee.

SPOILING A BUILDING OF COCKERELL'S.

SIR,—One of the late Professor Cockerell's masterpieces, the Liverpool, London, and Globe Insurance building, Dale-street, Liverpool, is now being "restored" (*sic*) in a manner which the following sketches will, I hope, make clear.

Sketch A indicates the profile of the main cornice of the building from which the part hatched has been cut away for the whole length of the cornice, so that it now has the profile of the thick black line.

Sketch B is one of the capitals of the main order, enriching the upper part of the principal facade, and is one of those few remaining that have so far not been touched.

Sketch C is a similar capital, "restored." Six have already been so treated.

The work has been in progress for some time past, but as it has always been carefully screened from sight with sheets, the extent of the vandalism is only just beginning to appear, and to the casual passer-by in the street below is even now not very noticeable, as great care has been taken to wash over the new work and stone surfaces with a black mixture to give it an appearance of age.

As the building is the property of one of the wealthiest corporations in Liverpool, who, I am sure, are proud to have in their keeping one of Liverpool's greatest adornments, it is hard to understand the motive of such regrettable treatment; and one can only conclude and hope that it is the want of knowledge of what is actually taking place that prevents them from at once issuing instructions for this vandalism to cease, and, further, that all those capitals already mutilated should be reinstated in an efficient and capable manner, and, if impossible to reinstate, replaced with careful copies of the originals. The mutilation of the cornice is however, I am very much afraid, irremediable.

I may add that, not having access to the building, my sketches had to be made from a distance, but with aid of a powerful field glass.

ARTHUR E. NUTTER.

Liverpool, January 11, 1902.

The Student's Column.

DRAINAGE AND PRIVATE SEWAGE-DISPOSAL.

CHAPTER 4.—THE LAW IN LONDON (*Continued*).

THE legal decisions as to whether a sewage-conduit in the Metropolis is a "combined drain" or a "sewer" are somewhat conflicting, but one of the principal points of distinction appears to be whether, as a matter of fact, the conduit is laid in a public thoroughfare (in which case it is probably a "sewer") or in ground over which the public have no rightful way (in which case it is probably a "combined drain").

This view is to some extent confirmed by the case of Pilbrow *v.* Vestry of St. Leonard's, Shoreditch. Two blocks of tenements were separated from each other by a yard, which had a railing and gate at one end and a blank wall at the other. The single door of one block was entered from this yard, but that of the other block from a public street. An ash-pit was used in common by the tenants of the two blocks. Lord Esher, in delivering judgment, held that the conduit laid in the yard and receiving the drainage from the two sets of tenements was a combined drain and not a sewer. He seemed to think that the ashpit was unnecessary to the decision, the private yard being the uniting factor, and that, if this yard had been a thoroughfare, it would have divided the premises into two distinct buildings.

The Lowther Arcade case (Vestry of St Martin-in-the-Fields *v.* Bird) points in the same direction. The common conduit laid in the arcade and receiving the drainage from the shops on both sides was held to be a sewer, although the arcade was roofed over. The determining factor in the decision appears to have been that the public had unrestricted leave to pass through the arcade during certain hours of the day (Sundays excepted).

In the case of Andrew *v.* St. Olave's Board of Works (1898, 1 Q.B., 775) the plaintiff sought

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to recover from the Sanitary Authority the cost of repairing the single drain which carried away the drainage from two adjacent houses. Under Section 4, Sub-Section 1, of the Public Health (London) Act, 1891, the Sanitary Authority had served a notice on him requiring him to abate a nuisance* in connexion with this drain. Believing that the combined drain had been authorised by an order of the Sanitary Authority, and that in consequence he was liable for its repair, the owner executed the necessary works. On finding that the combined drain had not been authorised by any such order, he brought an action against the Authority for the recovery of the costs and expenses which he had incurred. It was held (1) that as non-compliance with the notice would have rendered him *primâ facie* liable to a penalty under Section 4, Sub-Section 4, of the Act of 1891, he was practically compelled to do the work, and that he could subsequently recover the expenses as money paid at the Sanitary Authority's request; (2) that the "expense of carrying the order into effect" mentioned in Section 11 includes the expenses of doing work in obedience to abatement notice, and that consequently the owner, *whether he was compelled to do the work or not*, could under that section recover the expense from the Sanitary Authority as the persons by whose default the nuisance was caused. The words which we have italicised seem to open up a wide field for private enterprise in respect of the abatement of public nuisances.

The case of Green *v.* Vestry of St. Mary, Newington (1898, 2 Q.B., ch. 1), raises a different question. Four houses were drained in 1874 by a combined operation under an order from the vestry. Subsequently, without the knowledge of the vestry or of the owner of the houses, a drain from the stable of an adjoining house was connected with the combined drain. A nuisance arose in connection with the drainage of the houses, and the vestry served a notice on the owner requiring him to abate the nuisance. It was held that the unauthorised connexion of the drainage from the stable with the drain from the four houses converted this "drain" into a "sewer," and that therefore the owner was not liable to abate the nuisance.

3. *Drainage Rights.*—The owner or occupier of premises has the right of using the public sewers for the reception of the drainage from his premises, but the conditions are more onerous in London than in the provinces. Section 61 of the Metropolis Management Amendment Act, 1862, repeals Section 77 of the 1855 Act, and in lieu thereof provides that "no person shall make or branch any sewer or drain, or make any opening into any sewer vested in the Metropolitan Board of Works, or in any vestry or district board, without the previous consent in writing of such board or vestry." If such consent is obtained, any person may at his own expense make the connexion, but the drain itself and the method of communication must be "in all respects as the board or vestry shall appoint," and payment must be made for the right of connexion in places "where any contribution to the cost of a sewer is payable in respect of drainage into the same." The maximum penalty for an offence against this section is 50*l.*, and the board or vestry may cut off the connexion or reconstruct the work, and recover the expenses from the offending person.

The payment referred to in the preceding paragraph is defined in Section 80 of the 1855 Act and Section 59 of the 1862 Act. By the former section payment must be made for the right of drainage into sewers built between September 3, 1813, and December 31, 1855, "at the expense of any person or body other than any Commissioners of Sewers." The payment must be made by the owner of the drained premises to the vestry or board in whom the sewer is vested, and the vestry or board will then hand the money over to the person or body at whose expense the sewer was built. Section 59 of the 1862 Act extends this provision to similar sewers vested in the Metropolitan Board, and to sewers constructed, or to be constructed, by private persons or bodies subsequent to January 1, 1856. Section 78 of the 1855 Act authorises a vestry or board, wherever it is necessary to open any part of the pavement or any street or public place for drainage purposes, to make the communication between the drain and sewer, and to construct such part of the drain itself as shall be under or in any street, and to recover the expenses from the owner of the premises.

By Section 69 of the Act of 1855 a vestry or board may not only alter, but also discontinue, close up, or destroy any sewer vested in them. In the latter case, the vestry or board must provide some other sewer or drain, and connect the old private drains to it; and whether the old sewer is altered or a new sewer substituted, the vestry or board "may contract or otherwise alter" the private drains communicating with the sewer, or may close up or destroy the private drains and provide new drains, "but so that, in every case, the altered or substituted drain shall be as effectual for the use of the person entitled thereto as the drain previously used."

The case of the Vestry of St. Martin-in-the-Fields *v.* Ward (1897, 1 Q.B., 40) turned on this section. The vestry had constructed a new sewer in substitution for an old one into which a house was previously drained, and it became necessary to make a new drain from the house. It was held that Section 73 (see below) of the M.M. Act, 1855, did not apply, and that the vestry could not recover from the owner of the house the expense of making the new drain.

4. *Drainage Duties and Responsibilities.*—Section 73 of the Metropolis Management Act, 1855, requires old and new buildings which are in any part within 100 ft. of a suitable sewer to be drained into such sewer by means of covered drains "of such materials, of such size at such level, and with such fall as shall be adequate." The provisions are, however, more extensive than those in the corresponding section (23) of the Public Health Act, 1875, but as the details are now in the main covered by regulations and by-laws, they need not be here particularised. Section 75 renders it illegal to occupy any house or building newly-built or rebuilt, unless drains, &c., have been constructed to the satisfaction of the surveyor of the vestry or board.

Sections 72 to 75 empower the vestry or board to cause an inspection to be made of drains, cesspools, &c. and (after notice) to reconstruct defective works; the provisions are in the main similar to those contained in Section 41 of the Public Health Act, 1875, already described. Sections 40 and 41 of the Public Health (London) Act, 1891, deal with the same subject, and ought to be read in this connexion.

Buildings may not be erected "in, over, or under any sewer vested in the Metropolitan Board of Works, or in any vestry or district board, without their consent first obtained in writing." The penalty is demolition of the building and payment of the expenses incurred.

The Metropolis Management Amendment Act, 1862 (Section 52) authorises the vestry or district board to apportion the total cost of sewering new streets among the abutting owners. In the case of streets in which, before the construction of the new sewer, "there had been no sewer, or only an open sewer, but where sewer rates have been levied previously to such construction," the vestry or board must bear part of the cost of the new sewer. Section 49 of the same Act requires seven days' notice in writing, accompanied by a plan, to be given to the vestry or district board before making or branching any drain into a sewer vested in the Metropolitan Board of Works.

The Metropolis Management Amendment Act, 1890, contains two important sections relating to sewers and drains. Section 4 provides that "any person making any sewer, or branching any sewer or drain into any sewer vested in the Council,* without the approval in writing of the Council first had and obtained, or otherwise than in accordance with a plan and section thereof approved by the Council, or causing any such sewer or drain to be so made or branched, shall be liable to a penalty not exceeding fifty pounds." The Council may, by notice in writing, require the owners to reconstruct all work done in contravention of the foregoing conditions, or may re-execute the work and recover the cost from the owners. Section 5 contains similar provisions with regard to sewers vested in any vestry or district board. Under both sections the owners may, in their turn, recover from the persons who improperly carried out the work any costs and expenses paid to the Council, vestry, or district board.

The Public Health (London) Act, 1891, Section 42, provides that "if a water-closet or drain is so constructed or repaired as to be a nuisance or injurious or dangerous to health, the person who undertook or executed such construction or repair shall, unless he shows that such construction or repair was not due to any wilful act, neglect, or default, be liable to a fine not exceeding twenty pounds." A proviso is, however, added to the effect that the person charged with an offence under this section may cause "his agent, servant, or workman" to be brought before the Court at the time appointed for hearing the charge, and that the Court may decide whether the fine shall be imposed on the principal or on his subordinate.

The drainage of "underground rooms" is referred to in the same Act (Section 96, I., *d*, *f*, and *g*).

The London Building Act, 1894, Section 122, prohibits the erection or adaptation of "any building to be used wholly or in part as a dwelling-house" upon land "of which the surface is below the level of Trinity high-water mark, and which is so situate as not to admit of being drained by gravitation into an existing sewer of the Council," except with the permission of the Council and in accordance with the regulations which the Council may make. Appeal may, however, be made to the Tribunal of Appeal if objection is raised to the Council's decisions. Under this section the Council has made a regulation to the effect that the underside of the lowest floor must be at such a level as not to be liable to flooding, and that the building must be "efficiently and properly drained" to the satisfaction of the Council's engineer, either into a local sewer or into a main sewer of the Council.

5. *Sewage Disposal.*—Section 75 of the Metropolis Management Act, 1855, specifies that, in the case of buildings more than 100 ft. from any sewer ("existing or intended to be constructed"), the drains may discharge into "such covered cesspool or other place, not being under any dwelling-house, as the vestry or board shall direct." Since the passing of this Act, cesspools have been more stringently regulated. The Amendment Act of 1862 (Section 66) extends the distance between building and sewer to 200 ft., and stipulates that the cesspool shall not only be covered, but also watertight, and that it shall not be "within such distance from a house as the vestry or board shall direct." The section also gives to the Authority the same powers of enforcing the proper construction and maintenance of cesspools as it already possessed with regard to drains.

More recently the use of cesspools has been still further discouraged, and the by-laws now in force will be referred to in Part III.

6. *By-laws and Regulations.*—The difference between by-laws and regulations was briefly stated in Chapter I. The new drainage by-laws adopted by the London County Council will be considered in Part II. These are framed chiefly under the powers granted by the Metropolis Management Act, 1855. By-laws relating to water-closets, earth-closets, privies, ashpits, cesspools, and receptacles for dung, "and the proper accessories thereof," are made under Section 39 of the Public Health (London) Act, 1891, and apply to works "constructed before or after the passing of this Act."

THE LONDON BUILDING ACT, 1894: STAIRCASES IN PUBLIC BUILDINGS.

THE Tribunal of Appeal under the London Building Act sat at the Surveyors' Institution, Great George-street, Westminster, on Tuesday, to hear an appeal by the Rowton House, Ltd., against the requirements of Mr. Arthur Crow, District Surveyor for Whitechapel, in the matter of the construction of concrete staircases at the building to be known as Rowton House, Fieldgate-street, Whitechapel, under Section 78 of the Act. The members of the Tribunal sitting were Messrs. Penfold (Chairman), A. H. Hudson and E. A. Gruning.

The appellants were represented by Mr. William Morris, solicitor, and the respondent by Mr. J. F. Andrews, from the Solicitor's Department of the London County Council.

It appeared from the opening statement on behalf of the appellants, that Rowton House, Limited, is engaged in erecting another building intended for the accommodation of the working classes at Fieldgate-street, Whitechapel. For the purposes of the London Building Act, the Rowton Houses—of which

* The definitions of "general nuisances" will be found in Section 2 of the Public Health (London) Act, 1891, and of "particular nuisances" in Section 16. The principal powers of Metropolitan Sanitary Authorities in respect of the abatement of nuisances are stated in Sections 3 to 15 and 17 to 22. Offences against these sections may be punished by penalties.

* That is to say, the London County Council.

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this is the fourth in London—are classed as public buildings, and as such, the construction is to be to the satisfaction of the District Surveyor, under section 78 of the Act of 1894. The District Surveyor for Whitechapel (Mr. Crow) took exception to the mode employed in the building of the concrete staircase, and, in pursuance of his powers, served a notice requiring the respondents to provide strings under the unsupported ends and the stairs throughout the building. The method of construction followed was, it was explained, as follows:—The steps are span-drilled steps, jointed with square ends, pinned 9 in. in the wall. They are cast in moulds, and have two 1½ in. angle irons on each step. The tread and nose of the step are formed of granite chippings and Portland cement 2 in. thick in the proportion of two of chippings to one of cement. This portion is filled into the mould first, and the remainder of the step filled in with fine coke breeze in a proportion of three of breeze to one of cement. The quarter space landings are carried by two 3 by 3 steel joists to each landing, carried to within 4½ in. of the external face of the wall, and the concrete of the landings is pinned into the wall. The landings are of breeze and Portland cement in the same proportion as before, with a facing of granite chippings.

Mr. Morris, for the appellants, contended that the process followed out met all the requirements of the Act, and absolutely secured those who used the building from accident. The staircases of three similar houses had already been erected on these lines, and no objection was taken by the District Surveyors in the metropolitan boroughs concerned.

Mr. H. B. Measures, F.R.I.B.A., architect of the building, and Mr. G. J. Earle, clerk of the works, gave evidence in support of the appellants' case. The latter was cross-examined at length by Mr. Andrews as to the breaking-strain of the stairs in question.

Mr. Andrews, for the defence, pointed out that there might be latent defects in the staircase, and that for the protection of persons who resorted to this class of building, the contingency of a panic should be taken into account. It was intended to accommodate 800 persons, and, assuming that one staircase out of three was to become involved, it would leave the other two to provide the necessary egress for the 800 persons who might be in a state of panic, and thereby cause a very great strain to be put upon the steps. Sections 68 and 80 of the Act seemed to contemplate that stairs in public buildings should be supported at both ends. It was reasonable to look upon this building as in the nature of the class of buildings contemplated by Section 80 of the Act. Therefore the District Surveyor could not take the responsibility of passing the construction of the stairs without strings at the outer end. He submitted that the Tribunal should not take the responsibility of passing the plan when it had been admitted in cross-examination that the strings would afford an additional safeguard against the failure of the stairs from extraordinary stress.

Mr. Crow, the District Surveyor for Whitechapel, giving evidence in support of this contention, declared that the projection of 4 ft. 6 in. was too great for this form of stairs, and that the steps were liable to snap off close to the wall. Moreover, coke breeze, which was the component part of the steps, was not hard enough to stand a self-compressible strain. Portland cement, too, expands in the course of setting, and that action extends over many months. As, therefore, the steps would be composed of two different compositions the expansion would be unequal. He also gave evidence as to the load-bearing capacity of the stairs, stating that there might be a load equivalent to 10¼ cwt. on each step, and submitting that the steps ought to be calculated for a breaking strain of at least 50 cwt.

Mr. W. G. Perkins, of the London County Council Architect's Department, also gave evidence as to the stress that should be provided for in steps of this construction.

Eventually, the Tribunal adjourned the further hearing of the appeal with the view to personally viewing the staircase in question.

CROWN LANDS AND HOUSES IN LONDON.

MESSRS. E. STAFFORD HOWARD and J. F. F. Horner, Commissioners of His Majesty's Woods, Forests, and Land Revenues, in their report for the past year, just presented to Parliament, mention that since 1873 ground rents have been purchased by them to a considerable extent as investments for capital monies; and out of the monies invested in purchasing estates, &c., a total sum of about 1,982,336*l.* has been expended in buying ground rents, while further sums amounting to about 326,362*l.* have, since the same date, been invested in the purchase of other house property in London. The ground rents so purchased amounted to 75,000*l.* per annum, and the rental obtained for the houses, &c., purchased and let otherwise than at ground rents amounted to 12,682*l.* per annum. The investment of about 2,308,698*l.* has, therefore, produced an average return of nearly 4*l.* per cent., and, in addition to this, the capital values of the properties acquired have now very largely increased. In the schedule of messuages, lands, hereditaments, &c.' belonging to the Crown the following are shown as being in the county of Middlesex:—

Houses and Other Buildings Let at Rack-rents, or at Rents which have been Fined Down from Rack-rents.—Nine houses at Hampton Court, producing in the year 1900-1901 a rental of 654*l.* 4s. 7d.; fourteen houses at Kensington, 1,543*l.* 10s.; 329 houses in various parts of London, 70,408*l.* 16s. 4d. (the leases of these 329 houses will expire at various periods; the receipts include fines amounting to 755*l.* taken on the renewal of four of the leases); one house, Rolls Estate, 155*l.*

Land Let for Building Purposes, including Land Let at Ground Rents which have been Purchased.—Land in the City of London, with 129 houses thereon, built by the lessees, producing rents, &c., in the year 1900-1901, amounting to 48,645*l.* 16s. 6d.; land let at Hampton Court, with four houses erected thereon by the lessees, producing 264*l.* 9s. 3d.; land let for building at Kensington, with with eighty-five houses and some stabling, &c., built by the lessees, producing 8,522*l.* 17s. 8d.; land let for building at Millbank, with 307 houses thereon built by the lessees, producing 2,045*l.* 14s. 8d. (the leases will expire in 1943); land let for building in New Oxford-street, with eighty houses thereon built by the lessees, producing 4,890*l.* On (the leases will expire for the most part about 1925) land let for building at Victoria Park, with 649 houses thereon built by the lessees, producing 3,120*l.* 6s. 6d.; land let for building in Regent-street, Regent's Park, Strand, and other parts of London, with 2,933 houses thereon built by the lessees, producing 163,952*l.* 14s. 7d. (these leases will expire at various periods, for the most part about 1920); land on the Rolls Estate let for building with three houses thereon built by the lessees, producing 1,316*l.* The following is a schedule of London leases granted by the Commissioners in the year ending March 31, 1901.

No. 1, Chapel-place, Delahay-street, Westminster.—Lease granted to the Commissioners of Works and Public Buildings for 20½ years from October 10, 1900, at a yearly rental of 343*l.* 6s., progressively decreasing in subsequent years to 243*l.* 10s. for the last year of the term.

No. 161, High Holborn.—Leased to William James Webster for twenty-one years from October 10, 1805, at a rental of 65*l.*, the lessee to incur certain expenditure upon the premises and to insure the same against fire for 1,200*l.* at the least.

No. 7, Lawrence Pountney-hill.—A messuage leased to Hugh Charles Knowles for eighty-two years from September 29, 1808, at a rental of 350*l.*, subject to certain expenditure by the lessee on the buildings and to the surrender of a former lease which would have expired in 1915.

New Burlington-place.—A messuage and buildings, Nos. 13 and 14, New Burlington-place (formerly Old Burlington-mews), leased to the Mural and Decorations Syndicate, Limited, for twenty-one years from July 5, 1890, at 225*l.* for the first year, 300*l.* per annum for the next six years, and 325*l.* per annum thereafter.

Athenæum Club, Pall Mall.—Leased to Baron Avebury, Sir F. A. Abel, and Sir M. E. Grant-Duff, for sixty years from April 5, 1890, at a rental of 1,800*l.*, subject to the surrender of the lease (at a rental of 327*l.* 12s. and 33*l.* in lieu of Land Tax redeemed by the Crown), which would have expired by effluxion of time on April 5, 1927.

Regent's Park.—A piece of land in Regent' Park, containing about 12 a. 3 r. 20 p., with the messuage thereon known as St. Dunstan's Villa, leased to Baron Aldenham for 24½ years from April 5, 1900, at 250*l.* 16s. 7d. per annum. These premises were previously held under leases which would have expired by effluxion of time on October 10, 1924, at rents amounting together to 256*l.* 16s. 7d. per annum. On the application of the representatives of the original lessees and Lord Aldenham, surrenders thereof were accepted, and a new lease in lieu granted to his lordship direct on the whole for the unexpired residue of the terms of the surrendered leases.

Regent-street, &c.—A messuage and buildings, No. 15, Regent-street, Nos. 11, 12, 13, and 14, Babmae's-mews, and No. 4, Well-street, leased to the Junior Army and Navy Stores, Ltd., for sixty years from April 5, 1900, at a yearly rental of 3,114*l.*, and the buildings to be insured against fire to at least three-fourths of the value. The part of the premises known as No. 15, Regent-street, was last let for a term which would have expired by effluxion of time on April 5, 1918, at rents (inclusive of Land Tax redeemed by the Crown) amounting to 203*l.* 13s. 3d. per annum. That lease was surrendered as from April 5, 1900, pursuant to an arrangement for the grant of a new lease to the Junior Army and Navy Stores, Ltd., of the demised premises; together with Nos. 11, 12, 13, and 14, Babmae's-mews, and No. 4, Wells-street, which were acquired by the Crown by purchase from the Junior Army and Navy Stores, Ltd., and from John Thomas Christopher, and others, respectively.

Regent-street and Glasshouse-street.—A messuage known as the Imperial Restaurant, Nos. 60 and 62, Regent-street, and Nos. 7 and 9, Glasshouse-street, leased to William Godsell Curnick and Arthur Herbert Curnick for twenty years from January 7, 1899 (to be enlarged to the full term of eighty years from that date upon the performance of certain covenants), at a rental of 300*l.* for the first year, 500*l.* for the second year, and 810*l.* per annum thereafter, subject to the erection of buildings by the lessees and the surrender of a former lease (at 185*l.* 2s. 9d.) which would have expired in January, 1918.

Wells-street.—A messuage known as the "Three Crowns" public-house, No. 3, Wells-street, leased to Watney, Reid, & Co., Ltd., and Alfred John Banyon for ten years from April 5, 1900, at a rental of 100*l.* per annum, subject to the surrender of an expiring lease (20*l.* 5s. per annum), the expenditure of certain money upon the premises by the lessees, and the insurance of the buildings against fire to the extent of 1,500*l.*

Whitcomb-street.—A messuage and stabling, No. 15, leased to Ellis Brammall, jun., for twenty-one and a half years and eleven days from March, 1898 (but determinable by the lessee on April 5, 1905, on six months' notice), at 200*l.* per annum.

Whitehall-place.—A messuage, No. 3, leased to the Commissioners of Works and Public Buildings for nineteen years and one day from July 5, 1900, at 300*l.* per annum, subject to the surrender of the former lease (63*l.* per annum), which would have expired on April 5, 1912.

GENERAL BUILDING NEWS.

CHURCH, NEW HOLLAND, NORTH LINCOLNSHIRE.—The Bishop of Lincoln opened a new church on the 15th inst., at New Holland, which is in the parish of Barrow-on-Humber. Christ Church, as it is called, consists of a nave 67 ft. by 28 ft., and a chancel 30 ft. by 21 ft., with provision for a tower 17 ft. square on the north side. It is built entirely of red brick in the Perpendicular style, and roofed with Staffordshire tiles. Internally the roof is of open timber panelled under the rafters. The seats are all open and of stained wood, and there is accommodation for 317 persons. Mr. C. Hodgson Fowler, F.S.A., was the architect, and the general contractor was Mr. A. Lyons, of Norton, and the clerk of works, Mr. A Gordon.

CONGREGATIONAL CHAPEL, LINCOLN.—On the 15th inst. the memorial stones were laid of the new Congregational Chapel in course of erection at South Bar, Lincoln. The chapel has a frontage to High-street. It is in the Perpendicular style, and it will be 35 ft. wide and 57 ft. long on the ground floor, and extending backwards from the gallery about 11 ft., making a total length of 68 ft. On the north side there is an aisle about 9 ft. wide, and between that and the main arch are stone pillars and arches. The entrances to the ground floor comprise an outer and two inner vestibules. There is a separate entrance with a stone staircase to the gallery, which is at the end only, and a space is provided for an organ at the east end of the aisle. The choir seats are placed on each side of the rostrum. The edifice is built of red brick, with stone dressings, the windows being glazed with cathedral glass, in lead quarries. The roof timbers will be of pitch pine, stained and varnished, and will have plaster panels between, and all the internal woodwork will be of pitch pine. The building will be heated by hot water, and will accommodate 450 persons. The total expenditure involved is about 3,000*l.* The architect is Mr. J. H. Cooper, Lincoln, and the contractors Messrs. Mawer Bros., Louth.

SCHOOL, STOW-ON-THE-WOLD, GLOUCESTERSHIRE.—The new schools for girls and infants built for the School Board have just been opened. The shape of the site necessitated the adoption of a two-storied building—the girls being placed upon the upper floor and the infants upon the ground floor. The girls' department is approached by a separate entrance and an easy staircase, the accommodation being as follows:—Schoolroom, 44 ft. by 22 ft.; classroom, 20 ft. 6 in. by 20 ft.; cloakroom, 16 ft. by 12 ft.; lavatory, 12 ft. by 12 ft. The infants' department is similar to that provided for the girls. The exterior is faced with local stone, and the roof is covered with stone slates from the Eyford Hill quarry, some few miles away. The accommodation gives a total of 290—viz., 154 infants and 136 girls; the cost of the building being 3,264*l.* Mr. H. W. Chatters, architect, of Cheltenham, has designed and superintended the erection of the buildings, which have been erected by Messrs. George Howman & Co.

PROPOSED WORKHOUSE, FYLDE, LANCASHIRE.—On the 15th inst. a special meeting of the Fylde Board of Guardians was held to consider the advisability of proceeding with the erection of the proposed new workhouse. In the course of the proceedings Mr. Heywood, of Messrs. Heywood & Harrison, Accrington and Lytham, the architects, explained the plans. It was ultimately agreed to erect the buildings.

COUNCIL HOUSE, YARDLEY, NEAR BIRMINGHAM.—The new Council House and Public Offices at Sparkhill, for the parish of Yardley, were opened on the 15th inst. The building including site and equipment, which has been erected at a cost of 10,000*l.*, adjoins the Sparkhill police-station. It is of brick, with stone dressings, and Cotswold stone tiled roof. There is a gable at each end, whilst the central portion is relieved by a circular bay running up to the roof. At the north end is a clock tower, about 80 ft. high. There are two entrances at the

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front. One communicates with the main staircase leading to the Council Chamber, and the other is adapted for visitors to the surveyor's department. On the ground floor there are eight offices. The rate-collectors will be accommodated in two offices. A stone staircase leads to the first floor, and opens on to a corridor, divided into bays by piers and panelled ceiling, and running the whole length of the Council Chamber and committee-rooms. The chamber measures 50 ft. by 27 ft. The roof is open timbered, and the apartment is lighted by stone mullioned windows and leaded lights facing Stratford-road, and a line of clearstory windows, filled with stained glass, on the opposite side. Entering from Court-road is the depôt, comprising fire-station, mortuary, stabling, workshops, messroom for the firemen, &c. Mr. A. Harrison was the architect.

WHITWORTH HALL, OWENS COLLEGE, MANCHESTER.—The Whitworth Hall building, just completed, occupies the south-east angle of the Owens College site, and, so to speak, completes the College buildings. Adjoining it on the north is the large tower which has for many years been the principal feature of the college, and on the west stands the Christie Library, which is the last part of the college previously completed. The site is peculiarly adapted to the nature and requirements of the new building, for, being bounded as it is by streets on two sides—viz., Oxford-street on the east and Burlington-street on the south—the entrances are very commodious. The Whitworth Hall proper is confined to the upper story, the ground floor being occupied by a number of rooms of relatively small size. These are suitable for various purposes. Most of the rooms are about 18 ft. by 17, and others are larger. One of them is intended to serve, if necessary, as a kitchen in connection with any banquets that may be held in the hall above. A wide carriage archway spans the space between the new hall and the older buildings. Out of this archway access can be obtained—northward into the old buildings, southward into the new. Immediately within the entrance of the new building is a hall with columns, out of which a wide corridor leads between the above-mentioned rooms into the staircase hall, which is also approached from the street entrances in Oxford-street and Burlington-street. The staircase, which is screened from the hall by an arcade, divides right and left, and leads in the first instance into the floor of the building. Further flights of the staircase, which are confined within the angle-towers on the south end of the structure, lead not only to the raised seats at the back of the hall, but also to the galleries at the higher level. The width of the hall is 50 ft., and the total length is about 130 ft. Not all of the length, however, is visible, for the north end is partially blocked by the great stage, which is surmounted by galleries and by the large organ. The most striking feature of the hall is its roof. This is constructed in oak, and is a modification of what is known as the hammer-beam roof. Its construction has necessitated the use of buttresses, which pleasantly break up the long length of the building, and are in harmony with the buttresses of the earlier museum buildings. The principals, which are in the form of pointed arches, are sustained at either side of the hall by six granite columns. The windows at the sides have two lights each, and are divided in their height by transoms. These windows, as well as the large window at the south end, are filled with coloured glass, but the latter is further enriched by the addition of arms, chiefly those of benefactors of the college. All the visible woodwork is of oak. The hall is not fitted with fixed seats, as the variety of uses to which it will be put would render such an arrangement impracticable. The stone used—Minera stone—is the same as that which has been employed in the rest of the college buildings, and the style of the work is more or less identical with that which has hitherto been executed from the designs of Mr. A. Waterhouse, R.A. The interior height of the hall from the floor to the apex of the roof is 65 ft. The towers at the south end—which have naturally been kept low so as not to unpleasantly rival the main tower of the college—rise only to a height of 100 ft. above the pavement. Many firms have been engaged in the construction. The general contractors were Messrs. Southern & Sons, under whom Messrs. Corcoran carried out the masonry. Mr. John Grundy has done the heating, the wrought-iron work was by Messrs. Hart, Son, Peard, & Co., and the stained glass by Mr. George Wragg. Mr. Oppenheimer has executed the mosaic floors, and the whole of the work has been under the supervision of Mr. William Rutherford, permanent clerk of the works at the College. Mr. Paul Waterhouse has been mainly instrumental in carrying out his father's ideas.—*Manchester Courier.*

PUBLIC OFFICES, FELLING, DURHAM.—This building, the foundation-stone of which was laid on the 20th inst., is intended to provide accommodation for the various public bodies and officials of the district. The site is situated on Sunderland-road, and the building will have a frontage of about 130 ft. to the roadway. The main entrance-hall, which is 10 ft. wide, will be approached by a flight of steps from the roadway, and a clock tower will be carried up immediately over the entrance to a height of 65 ft. from the road level. Corridors branch off on either side of the main hall, and here the various offices are situated. On the ground floor are offices for the Clerk to the District Council, Clerk to the Heworth School Board, relieving officer, assistant overseer, rate collector, school attendance officer, together with large Board room for the use of the local Guardians and the Relief Committee of the Heworth School Board, with waiting-room attached. There is also a telephone-room on this floor, with an additional spare office. On the first floor, which is approached by a stone staircase, are situated the Council Chamber and Board room for the District Council and the School Board, committee-room, councillors' retiring-room, waiting-room, surveyor's offices, and rooms for the medical officer and the sanitary inspector. In the basement will be a fireproof strongroom, cellars, &c., and on the attic floor rooms are provided for the caretaker. The Council Chamber is 40 ft. long by 24 ft. wide. The committee-room will have direct access to the Council Chamber by special doors. The building will be lighted with the electric light. The erection will be entirely of stone, the walls being faced with coursed rock-faced blocks, and the dressings will be moulded and polished. The design is Italian Renaissance. The cost of the building without the site will be about 7,000*l.* The contract is let to Mr. John Wilkinson, contractor, Felling, and the architect is Mr. H. Miller, Felling.

TOWN AND COUNTY BANK, ABERDEEN.—The new branch building for the Town and County Bank, which is to be erected at the foot of Marischal-street, on the site of the present building, will be erected from plans prepared by Mr. R. G. Wilson. The chief elevations will be to Marischal-street and Regent Quay. The building will be of the Renaissance style.

SANITARY AND ENGINEERING NEWS.

ELECTRICITY SUPPLY, MANCHESTER.—The foundation-stone was laid on the 10th inst. of the Stuart-street generating station, near Philips Park. For purposes of economy, it was necessary to go outside the city proper to find ground for the station. Sub-stations will have to be established—stations at Bennett-street, Chorlton-cum-Hardy, Cheetham Hill, Denton, Didsbury, Fallowfield, Harpurhey, Moss Side, Newton Heath, Rusholme, Ardwick, and elsewhere. Dr. Kennedy, the adviser of the Corporation, has general supervision of the scheme. The first two parts of the scheme are now being carried out. The first part is based on plans and specifications prepared by Dr. Kennedy for the development of electrical energy representing 15,000 h.p. The other part is based on the plans and specifications of Mr. Metzger, the City Electrical Engineer, and it provides for energy representing 12,000 h.p. The buildings are steel-framed structures, the walls being filled in with brickwork. The engine-house is 114 ft. 6 in. long and 131 ft. wide and 60 ft. high, being divided into two bays of 53 ft. wide. Each bay will contain three engines of 2,500 h.p. There is also a centre bay of 25 ft., containing the condenser plant and other machinery. The boiler-house is 200 ft. long, 93 ft. wide, and 53 ft. high. The first instalment of plant will consist of twenty-four Babcock & Willcox boilers, supplying steam for engines of a capacity of 15,000 h.p. The engineering works are being carried out by Dr. Kennedy, of London, Messrs. C. S. Allott & Son, civil engineers, of Manchester, being responsible for the buildings and constructional works, which are being carried out under their supervision.

WATER SCHEME, BARNSLEY.—On the 17th inst. a Local Government Board inquiry was held at the Barnsley Town Hall relative to the application of the Town Council to borrow 120,000*l.* for purposes of water supply. There were present Alderman Raley, Chairman of the Water Committee; Mr. J. H. Taylor, Borough Surveyor; Mr. Hawksley, Consulting Waterworks Engineer, and others. Mr. Hawksley said the actual cost of the embankment would be practically 100 per cent. more than the amount originally estimated. This was due entirely to the great rise in the price of labour and materials, and it had also been found necessary to go to a greater depth in order to get a good foundation. The unexpected nature of the strata had also increased the cost. The Sheffield Corporation had taken over the obligations of Barnsley with regard to compensation water, and they had been able to reduce the area, but the capacity of the reservoir, owing to its having been deepened, would not be reduced. The estimate for the filter beds had been increased from 12,000*l.* to 28,000*l.*, though nothing had yet been done beyond the clearing of the land for their construction. The population to be supplied was 93,000.

FOREIGN.

FRANCE.—The jury in the competition opened at Albi for a new covered market have given the commission to M. J. André Michelin, constructional engineer, of Paris. A premium has been awarded to M. Gabelle, of Marseilles.——The jury in the competition for a girl's school at Algiers have awarded the first premium to M. Darbéda, Government Architect. M. Bévia obtained the second premium, and M. Soussy the third.——The Prefect of the Seine has appointed a committee of eight to decide as to works to be admitted to the permanent art gallery to be formed at the Petit Palais. The members of this committee are MM. Bonnat, J. P. Laurens, Gérôme, Benjamin-Constant, Fremiet, Mercié, Detaille, and Carolus-Duran—the last-named appointed officially as President of the Salon. The special committee will act in concert with the Art Committee of the Paris Municipality.——The jury of the Ecole des Beaux-Arts have awarded the prize in decorative composition (Section of Architecture) to M. Portier; only a "troisième médaille," however, has been awarded. The subject was the wall of a bathroom. ——M. Alfred Boucher, the sculptor, is just completing an equestrian statue of the Shah of Persia. M. Mercié has completed the monument to Gounod, to be erected in the Parc Monceau, Paris. The bust of the composer will be placed on a marble stele at the foot of which will be grouped three figures representing the composer's three principal heroines—Mireille, Sappho, and Margaret; and by their side a figure seated at a clavecin personifies "Inspiration."—M. Delrie, the sculptor, has been commissioned to execute, for the Bibliothèque Nationale, the bust of Labrouste, the architect of the portion of the building facing Rue Richelieu, as well as of the Gallery of Engravings. The Government has also commissioned busts of various other persons concerned in the foundation of the National Library.

AUSTRALIA.—A public meeting has recently been held in Sydney at the Town Hall for the purpose of discussing the best way of securing a new Building Act for the city and New South Wales generally. The Mayor remarked that the hands of the City Council were practically tied in the matter of dealing with insanitary and dilapidated buildings, slum areas, &c., as a result of the inefficiency of the existing Act. The President of the Institute of Architects, and the President of the Master Builders' Association, spoke strongly in favour of the amendment of the law at present in force.——A return made to the New South Wales Legislative Assembly shows that the expenditure on the parliamentary buildings, Sydney, from 1891 to 1901 was 31,004*l.* ——A large Presbyterian church is about to be erected at Leura, New South Wales.——During the forthcoming recess the Minister for Works intends to expend 5,000*l.* in improvements to the ventilating and lighting of Parliament House, Sydney.——Large additions are being made to the Sydney Art Gallery buildings. They comprise the erection of the main central portico with ten Ionic columns, the inner lobby, and the vestibule entrance to the galleries. The vestibule is being constructed wholly of stone, while the niches for statuary on either end and the entrances and exits are subdivided by detached columns. Mr. W. L. Vernon, the Government Architect, is of opinion that the work already done is sufficient to show the necessity of redesigning the landscape features of the Outer Domain in its relation to the building.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT. —The Albion Clay Company have removed their offices to larger premises at Members Mansions, 38, Victoria-street, Westminster, S.W.

HUDDERSFIELD MASTER BUILDERS' ANNUAL DINNER.—The annual dinner in connection with the Huddersfield and District Master Builders' Federation and Quarry Owners' Association was held at the Masonic Hall, Fitzwilliam-street, on the 18th inst. Alderman W. H. Jessop presided, and he first submitted the loyal toast. Mr. T. S. Ullathorne, in submitting the toast of "The Yorkshire Federation," remarked that for fifty years the men had been allowed to organise amongst themselves, and when there had been trouble the employers had simply been at their mercy. There had been local organisations, but what with jealousy and one thing and another they had not done much good. Owing to the action of their President, the Federation came into existence about four years ago, and it was as yet only in its infancy. The value of federation was that instead of being disunited they were now united in one body, and he hoped in a few years' time the masters would be joined together all over England. —Mr. J. Biggin (Selby), in response, urged the advisability of bringing all the sub-trades into one association. They would never have the power they ought to have, and have the things they ought until the trades were bound together in one national association. In so far with the joiners there had been no friction whatever, but there had been with the plumbers, slaters, painters, and plasterers, and there was a little jealousy and a little ill-feeling which he hoped to see put on one side, although he might say at the present time it was a very difficult problem, and a way had not presented itself for the little difficulty to be bridged over.—Mr. W. R. Thompson (Dewsbury) gave "The Huddersfield and District Master Builders' Federation and Quarry Owners' Association." After referring to the advance of the Association during the short time it had been in existence, he said the masters in Huddersfield had worked together more amicably than had those in other towns. He hoped this feeling would continue to grow, as it was necessary for the masters to become members not only of the Master Builders' Association, but of other associations interested in the

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welfare of the trade. Having taken an active part in those associations for a number of years, he now saw the necessity of every section of the trade joining hands. He also urged the advisability of building up a reserve fund. Mr. L. Radcliffe, in response, also remarked upon the necessity of combination amongst the masters, otherwise the Association would not be of much good. He referred to the question which had been brought before some of the public bodies of the town with regard to the employment of certain firms who had agreed to pay standard wages. A list had been issued of the firms who had agreed to these terms, but there were a number of firms in the town who did not appear on the list, and amongst these were some of the best firms in the town. It seemed to him that it was very hard that these firms should be debarred from sending in their prices, and it might result in the ratepayers having to suffer. Mr. John Hirst (Cleckheaton) gave "The Town and Trade of Huddersfield," and Alderman Calvert and Mr. John Dawson responded. Other toasts were "The Visitors," submitted by Mr. J. H. Taylor, and responded to by Mr. Connell (Selby) and Mr. J. Berry, and "The President," by Mr. John Pyrah.

BRITISH FIRE PREVENTION COMMITTEE.—The Committee have arranged for a very important test to take place on Wednesday next with a large warehouse floor constructed entirely of Karri and Jarrah wood, the floor being constructed on the same principle as recently adopted for the large warehouses in the new Free Port at Hamburg. There will also be tests with Karri and Jarrah doors for comparison with the fire resistance of oak and teak doors. A large attendance of visitors is anticipated, including several foreign correspondents who will be specially visiting London. —It is announced that the Silver Medal which the Committee offered for the best Essay on fire-resisting materials exhibited at the International Fire Exhibition of 1901, at Berlin, has been awarded to Lieutenant Elsner, of Berlin, the assessors being Chief Officer Giersberg, of Berlin, and Mr. Edwin O. Sachs, the Chairman of the Committee. The essay will be published in the Official Government Report of the Exhibition in the German language, and also in the Committee's publications in an English translation.

COLLAPSE OF A MILL IN BELFAST.—A most serious accident occurred in Smithfield Spinning Mill, Belfast, on Monday morning. The accident came without any warning, and before the slightest effort could be made by the workpeople to escape from the building. Shortly before 10 o'clock the walls of three large rooms used for reeling purposes collapsed with a loud crash, bringing floors, machinery, and workers, many of whom were women, down with them to the basement. The mill was surrounded with a dense cloud of dust, which continued to rise for a considerable period from the ruins. As soon as the dust cleared somewhat it was evident that numbers of workpeople were struggling in the *débris*. Several men and women were quickly extricated, some unconscious, others apparently dead. The fire brigade was quickly on the scene, and very soon ten persons, some dead, were taken out; but an immense heap of brick, mortar, twisted machinery, and iron girders had yet to be tackled. The huge building is divided in two from top to bottom. Many who escaped being buried alive were seriously injured by the falling beams and machinery. The mill, which is the property of the Smithfield Flax Spinning and Weaving Co., has been working for over fifty years. Mr. Arthur Heardman, managing director, in an interview, attributed the accident to the collapse of one of the piers of the mill. The walls, he stated, have never shown any sign of weakness. The manager of the mill has expressed the opinion that the pillars supporting the first floor gave way, and that the entire upper portion of the building thus was brought down. Other theories to account for the collapse of the mill have been mentioned.

YORKSHIRE FEDERATION OF BUILDING TRADES EMPLOYERS.—The annual dinner of the Yorkshire Federation of Building Trades Employers was held on the 16th inst. at the Windmill Hotel, York. Councillor Mansfield, York, President, occupied the chair. The company numbered about 130. After dinner the usual loyal and patriotic toasts were honoured. Mr. John Dawson (Huddersfield) submitted the toast of "The National and County Federations." He remarked that if they were true to themselves, they would lift up the building trade to its proper dignity and level. They were not associated together for the purpose of aggression of their workpeople. On the other hand, they desired the latter to do that which was just, fair, and honest to their employers. There were some things in the building trade that would not bear the light of day. There were honest, good workmen, but they were overridden, and not allowed to have their way.—Mr. J. Lowry (Newcastle), in responding, said the Federation had advanced much during the last few years. It was doing good work throughout the country, and he had no doubt would continue to do so. Mr. G. White (Sunderland), in proposing "The Yorkshire Federation," acknowledged the support given by the society to the Tyneside employers during the protracted dispute of last year. The President replied, submitting that it was their duty to see that their clients got value for their money, and to educate the men to a higher ideal than that of doing the minimum amount of work for the maximum amount of pay. Ald. Jessop (Huddersfield) also responded. —At the business meeting in the afternoon, the President urged upon the members greater loyalty and devotion to the Yorkshire Federation and its work during the ensuing year. The annual report and balance-sheet were presented and adopted as a most satisfactory record of the past year's work. The question of uniform working hours for the operatives was held over until the various branch reports came in. It was resolved that all ex-presidents of the Yorkshire Federation be admitted members of the Executive Council, ex-officio. The treasurer, Mr. W. R. Thompson (Dewsbury), in retiring from his office after four years' arduous labours, received the thanks of the Federation; and Mr. W. E. England (Barnsley) was elected to the vacancy. Mr. Geo. Stanley, of Hull, was re-elected to the position of secretary.

OPEN SPACES AND PLAYGROUNDS.—Subscriptions have been made by the Corporation of London (600*l.*), the U.D. Council of Walthamstow (300*l.*), and Mr. E. North Buxton (300*l.*), towards the estimated cost (1,800*l.*) of adding about three acres of water area to the Hollow Pond. The Corporation laid out the ornamental pond, which is available for swimming and boating, four or five years ago in some swampy ground of the Leyton Flats, which form the southern portion of Epping Forest.—The London Playing Fields Society have acquired the Magdalen playing ground, at Earlsfield Station, on the London and South-Western line, in place of the Burntwood Field, which is now to be converted for building purposes. The society have taken a lease of about thirty acres, at Raynes Park, recently bought by Lord Alverstone, Lord Kinnaird, Sir E. Chandos-Leigh, and others, and to be transferred to the society as soon as the purchase-money, about 8,000*l*, is forthcoming. To that sum the Trustees of the London Parochial Charities Fund contribute 1,000*l.*—It is stated that Mr. W. H. Lever has offered to Bolton, his native town, an estate which extends over 300 acres, and comprises Rivington Park, and will lay out the park and grounds for purposes of recreation and resort, by dismantling the farms, removing the fences, and otherwise clearing the ground; and that Colonel G. A. Cooper, of Barrington Park, Burford, is about to present Grant Lodge and its grounds to Elgin, his birthplace. The house and grounds, of forty acres, lie near the cathedral.—The Metropolitan Public Gardens Association have agreed to lay out the churchyard of St. Paul's, Larkhall-rise, Clapham, and the garden of St. Philip's, Avondale-square, Old Kent-road, S.E., and invite contributions to a sum of 50*l.* for making a school playground in Bethnal Green. The Society have under consideration the excessive and unskilful lopping of trees in various quarters of London, and intend to oppose the projected construction of a second tubular railway beneath Hampstead Heath.

INCORPORATED CHURCH-BUILDING SOCIETY.—This Society held its usual monthly meeting on Thursday, the 16th inst., at the Society's House, 7, Dean's Yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.:—Building new churches at: Glass Houghton, St. Paul, near Castleford, Yorks, 40*l.*; Lansdowne, Holy Trinity, near Burton-on-Trent, Derby, 25*l.*; Scarborough, St. Saviour, Yorks, 40*l.*; South Retford, Notts, 80*l.*; Upton Park, St. Alban, Essex, 150*l.*; Middlesbrough, St. Columba, Yorks, 130*l.* in lieu of former grant of 112*l.*; Pockthorpe, Emmanuel, near Norwich, 100*l.* in lieu of former grant of 70*l.*; and Thornaby-on-Tees, St. Luke, Yorks, 70*l.* in lieu of former grant of 40*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Gunness, near Doncaster, Lincs., 5*l.*; Hartshorne, St. Peter, near Burton-on-Trent, Derby, 20*l.*; Hull, St. Barnabas, 10*l.*; and Newland, St. Augustine (Hull), 20*l.* The Society likewise accepted the trust of a sum of money as a repair fund for the Church of St. Andrew, Horbling, Lincs. The following grants were also paid for works completed:—Sparkbrook, Emmanuel, near Birmingham, 500*l.* on account of a grant of 1,000*l.*; Hanley, St. Jude, near Stoke-on-Trent, 250*l.*; Chevening, St. Botolph, near Sevenoaks, Kent, 30*l.*; Llanfihangel-Glyn Myfyr, St. Michael, Denbigh, 10*l.*; Manningtree, St. Michael and All Angels, Essex, 25*l.*; Willesden, St. Matthew, Middlesex, 250*l.*; Plumstead, St. Paul, Kent, 150*l.*; West Malling, St. Mary, Kent, 50*l.*; Preston, St. Matthias, Brighton, 20*l.*; and West Bromwich, The Good Shepherd, Staffs, 25*l.* In addition to this the sum of 143*l.* was paid towards the repairs of fifteen churches from trust funds held by the Society.

INSTITUTE OF BRITISH DECORATORS.—Mr. G. C. Haité continued his course of lectures to the Northern District of the Institute of British Decorators, in the Museum Galleries of the Manchester School of Art, on Thursday, the 16th inst., his subject being "Decoration: Its Methods and Materials." The lecturer said he must assume his audience to be conversant with the lecture delivered by him at Sheffield on November 28 last, when he dealt with the subject of decoration from a historic point of view; and he must also assume that he was addressing an audience of decorators. The connexion between architecture and decoration was of the greatest importance, and decorators should carefully study their relationship. Unfortunately in many cases of domestic decoration, with which one had to deal, there was no architecture worthy of the name; and to that extent, the decorator had nothing to work upon. There was much that was repulsive to good taste in the misapplication of form and colour in pictorial and decorative art, in jewellery, and even in advertising posters. It really seemed as if in the latter direction an official censorship was necessary. It was anomalous that we should have a censorship of plays for instance, and no supervision of what passed as art in many of our public places. Bad decoration was, moreover, supposed to entail no consequences. The lecturer then spoke at considerable length on the principles of ornament. There were people who ridiculed the idea of law in decoration. Applied art, however, depended on law. The essential principles, underlying everything else, were fitness and beauty. Their application must be fit as to time, fit for the place, fit for the object decorated, and fit as to the medium employed. He enumerated some of the laws which were interpretations of the principles referred to: symmetry, balance, proportion, spacing, subordination, repose, radiation, contrast, repetition, rhythm, &c. Beauty might be defined as a harmonious co-operation of many pleasing qualities. Decoration was subject to many limitations, and often these limitations conferred positive advantages. Take, for instance, the Moorish prohibition of the imitation of nature. As a result of that, we had the use of many forms showing very beautiful results. The limitations imposed by lines in lead light work were an absolute necessity, yet once recognised, what possibilities arose in their use. In stencilled ornament the fact of having to use ties imposed certain limitations. When properly employed, ties became a very effective part of the ornament. Coming to essentially modern forms of decoration, there appeared to be two schools of thought in existence, one of which would prohibit many examples of manufactured goods, believing that the true sphere of the decorator was in the production of ornament in the flat, and the other recognising that the goods made ready to hand were a product of the time, meeting real needs, and their use, therefore, quite legitimate. The first idea implies that every executant should be a designer, and he was in favour of this, if the men could only be found. We must differentiate, however, between a designer and a house-painter, for design required a master hand. He would urge upon all decorators the desirability of having private designs, prepared for them by competent designers. Such men could offer great advantages to their clients. Speaking of the many relief materials now in use, the lecturer pointed out many decorative possibilities, if only the circumstances attending their use were fully considered. These materials were put into the decorator's hand in an incomplete state, and left for him to finish. By a wise selection and use of them, good effects might be produced.

PRESENTATION BY PENRHYN QUARRYMEN.—The following is a copy of a resolution passed at a meeting of the workmen and officials now employed at the Penrhyn Quarry:—"Resolved unanimously, that we, the workmen and officials now employed at the Penrhyn Quarry, beg to tender to the Hon. Ina Douglas Pennant our most respectful and sincere congratulations on the occasion of her approaching marriage, and to ask her kind acceptance of the accompanying tea kettle and candelabra, which we are proud to have the privilege of offering as an expression of our sincere regard and esteem for herself personally, and our attachment and respect for Lord and Lady Penrhyn and family, from whom we have always received, in health and in sickness, the greatest possible kindness and consideration. Signed on behalf of the workmen and officials:—H. P. Meares, R. Williams, W. McKie, J. Jack, E. Mills Roberts, David D. Davies, H. P. Roberts, R. J. Jones, William Thomas, John Evans, W. J. Griffith, John Thomas, Robert Jones, David Pritchard, Melancthon Williams, Percival Jones, William Roberts, John Williams, David Evans, William Edwards, W. W. Jones, William Roberts, John Ellis Jones, and Henry Pritchard."

THE EAST END DWELLINGS COMPANY.—From the report of this company, to be submitted to the nineteenth ordinary general meeting on February 3, we learn that terms have been arranged for a building lease of an important site in Bethnal Green, with frontages to Globe-road, Cyprus-street, and Gauber-street. As extensive building operations are now being carried on by the company on other sites in the immediate neighbourhood, it is not proposed at once to demolish the houses which are now on the land, but to wait for two or three years before beginning to rebuild. The new "Gretton Houses" on the Victoria Park-square Estate were opened in the autumn, and at the close of the year ninety-seven of the 168 tenements were let. Satisfactory progress is being made with the four blocks of dwellings on the site of the old Militia Barracks, and it is anticipated that they will all be ready for occupation in the summer. The new buildings on this site, which have been named "Thornhill Houses," are also progressing satisfactorily, and will be ready for occupation during the summer.

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NORMAN ARCHES, CHATHAM.—A meeting was held at Chatham last week to consider what course should be adopted with reference to the Norman arches recently discovered in pulling down a portion of the parish church for the purpose of rebuilding the old Georgian nave. Letters were read from Dean Hole, Major-General Sir Charles Warren, and others, expressing a hope that steps would be taken to ensure the preservation of these interesting relics of the original Norman church. A resolution was moved in favour of enlarging the scope of the restoration scheme so as to include this proposal; and it was stated that it would entail an additional expenditure of 1,000*l*. Three Nonconformists of the borough strongly supported the preservation of "monuments of the past which connect Chatham with the days of William the Conqueror," and the motion was carried unanimously, it being arranged that a special fund should be raised for the purpose. It was stated that contracts had been signed for the final section of the restoration scheme at a cost of 6,000*l*.

WINDOW, ST. MICHAEL'S, MYLAND.—A two-light memorial window to a lady has been placed in this church. The subject is the Angel Gabriel standing over the kneeling figure of the deceased, who is received by the Saviour. The artist is Mr. E. J. Prest, of London.

CAPITAL AND LABOUR.

THE BRADFORD BUILDING TRADE SETTLEMENT.—On the 14th inst. Mr. A. Gadie, representing the Bradford Master Builders' Association, and Mr. T. Dalbridge, sen., representing the Operative Masons' Society, waited upon the Mayor of Bradford (Mr. W. C. Lupton) at the Town Hall, and formally gave their approval to the terms agreed upon on the previous day, under which a settlement was effected in the dispute between the masters and their employees. The suggestion that a Board of Conciliation should be formed was then taken into consideration, and it was agreed, on the suggestion of Mr. Gadie, assented to by Mr. Dalbridge, that Mr. Lupton should be invited to act as chairman of a Conciliation Board which should consist of five masters and five operatives, to be elected by the respective societies. Mr. Lupton, it was understood, was to continue to hold office apart from his occupancy of the Mayoral chair. Mr. Lupton agreed to serve in this capacity, and the proceedings closed with an expression of thanks to him for the efforts he had made to bring the dispute in the building trade to a conclusion.

BIRMINGHAM BUILDING TRADE.—The master builders of Birmingham, it will be remembered, recently notified the men in the various branches of the trade of their desire to so modify the working rules as to secure uniformity of working hours. At present the hour of commencing work varies with the occupations of the men, and the desire is to remove what must necessarily be a source of confusion and inconvenience. In consequence of trade depression they also notified certain reductions of wages—in the case of plasterers and masons 1*d*. per hour, fixers (who are engaged in fixing masonry) ½d. per hour, and all the rest of the trades ½d. per hour. It was hardly likely that the men would agree to these proposals, and now that their replies have been received it is found that they have formally notified their opposition to any change, except in the case of the carpenters and plumbers, who, as a counter-blast, demand an advance of ½d. per hour. The committee of the Birmingham Master Builders' Association met on the 17th inst. to consider the position. There was a large attendance, and after a long discussion it was resolved to invite the representatives of the men to a conference on an early day.—*Birmingham Post.*

LEGAL.

ACTION AGAINST A BUILDING OWNER.

IMPORTANT POINT.

THE case of Hobbs *v.* Turner came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Mathew, on the 17th inst., on the appeal of the defendant from the judgment of Mr. Justice Kennedy in the King's Bench Division in favour of the plaintiff.

In this case the plaintiff, a metal worker, sought to recover from the defendant 27*l*. 10*s*. for work supplied for a house which was being erected for defendant by a builder under the supervision of an architect. The house was built under a contract in the form issued by the Royal Institute of British Architects, the contract price being 4,700*l*. The work was to be paid for by instalments as the work proceeded on the architect's certificate. Clause 28 of the contract provided that the provisional sums mentioned in the specification of materials to be supplied, or for work to be done by special artists or tradesmen, or for other works or fittings to the building, should be paid and expended at such times and in such amounts to such persons as the architect should direct, and the sums so expended should be payable by the contractor without discount or deduction, or by the employer to the said artists or tradesmen. It was further provided that the value of works which were to be executed by the contractor in respect of provisional sums, or in additional works, should be ascertained as provided by clause 13 of the contract. The contract further provided that at the settlement of the accounts the amount paid by the contractor to the artists or tradesmen, and the value of such works executed by the contractor, should be set against all such provisional sums or any sum provided for additional works, and the balance should be added to or deducted from the contract sum.

The specification contained this clause: "provide and fix iron balcony railings to design (allow 20*l*. for this, irrespective of carriage, fixing, and profit)." The architect (Mr. J. L. Williams) decided that the plaintiff, Mr. Hobbs, was to supply the ironwork for the balconies, and the builder asked Mr. Hobbs to send the designs to Mr. Williams, which he did. Mr. Williams, however, rejected the designs and sent the plaintiff his own designs. The ironwork was sent by the plaintiff to the builder, who had given the measurements and quantities, and the goods were invoiced and debited to the builder. Subsequently, on the invitation of the builder, Mr. Hobbs sent him his account. Later on, the builder wrote to Mr. Hobbs stating that Mr. Williams would certify the amount direct to the building owner (the defendant), which Mr. Williams did, giving a certificate in favour of the plaintiff for 27*l*. 10*s*. The plaintiff sent this certificate to the defendant, who kept it, but made no reply to the applications by the plaintiff for the money. As soon as the matter was placed in the plaintiff's solicitor's hands, the defendant denied liability, alleging that he had a claim against the builder for bad work. Mr. Justice Kennedy held that it would be wrong to the plaintiff to make him get payment of his money from the bnilder who had not had the money, and who, but for the certificate against the defendant, would have had a certificate including the amount in question, months before. He was of opinion that the suggested claim by the defendant against the builder, which was at most a claim for damages which might or might not succeed, did not affect the matter, and gave judgment for the plaintiff for the amount claimed, with costs. Hence the present appeal of the defendant.

At the conclusion of the arguments of Counsel, the Master of the Rolls, in giving judgment, said that, in his opinion, when one looked at the whole of the contract taken together, and not relying upon any one particular clause, the proper inference to be drawn as regarded this particular class of work was that it was intended that the building owner, and not the builder, should be the principal. If the builder entered into a contract for any of this class of work, he might make himself liable to the tradesman or artist; but as he was acting under the general scope of the contract, he would be acting as the agent of the building owner, and would create privity of contract between the building owner and the tradesman or artist. That could only be got rid of by the tradesman or artist contracting with the builder in such a way as to debar himself from resorting to the building owner. Nothing of that kind occurred in the present case. The plaintiff was put into relation with the defendant through the architect, and the order was given to the plaintiff by the architect. Although the invoice was sent to the builder by the plaintiff, the architect gave a certificate against the defendant and not against the builder, and sent it to the defendant. He thought, looking at the contract as a whole, the initial liability of the defendant in respect of this class of work was established, and that all the parties dealt upon that footing. He thought that the appeal should be dismissed.

The Lords Justices concurred.

Mr. Clavell Salter appeared as counsel for the appellant, and Mr. Arthur Powell for the respondent.

CLAIM BY THE EXECUTORS OF A QUANTITY SURVEYOR AGAINST AN ARCHITECT.

THE case of Leach *v.* Arber came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Mathew, on the 18th inst., on the appeal of the plaintiff from the decision of Mr. Justice Bigham, sitting without a jury, in the King's Bench Division on January 14 and 15, 1901. The case was fully reported in the *Builder* of January 19, 1901.

The action was brought by the executors of a gentleman named Robertson, a quantity surveyor who had died, to recover from the defendant, an architect, a reasonable sum for the preparation of some specifications required for the construction of a theatre and hotel at Plymouth. The question for determination was whether there was an implied promise on the part of the defendant to pay for the work, it being admitted by the plaintiffs that there was no express promise on his part. It seemed that in 1897 a Mr. Earl was employed by Mr. Robertson to assist him in the preparation of the bills of quantities for the theatre and hotel in question, and he was employed by Mr. Robertson on the terms that the remuneration that Mr. Robertson was to receive for the work should be divided equally between them. Mr. Earl did assist Mr. Robertson in the preparation of the bills of quantities, and received from Mr. Robertson in his lifetime the remuneration he was entitled to. When the bills of quantities were about to be prepared Robertson appeared to have discovered that Earl had in his possession the plans and specifications relating to a theatre at Edinburgh which, he thought, might be of assistance to the defendant who was the architect for the buildings in question. Earl's version of an interview which he had with Mr. Arber was that the latter told him that it would be a great assistance to him in the preparation of the plans if he could be furnished with specifications, and asked Earl to prepare them, and that he (Earl) would make the necessary arrangements with Robertson for payment and the work to be done. The plaintiff's case was that Earl then proceeded to draw out the specifications for the buildings. Mr. Arber, on the other hand, denied that he ever said anything or did anything to convey to Earl the idea that he was intending to pay for the specifications at all, or that he requested Earl to prepare them for him. Mr. Justice Bigham accepted Mr. Arber's version of what took place, and said that in his opinion the specifications were drawn out by Earl for the benefit of Robertson in preparing the bills of quantities, which were used by Mr. Arber in his capacity as architect. His lordship was of opinion that Mr. Arber was not liable to pay for the preparation of the specifications, but if the Court of Appeal should decide that he was wrong in holding that Mr. Robertson's executors were not entitled to recover in the action he found as a fact that 40*l*. would be ample payment for the work which was almost entirely desk work and consisted of little more than copies of the specifications which Earl had in his possession relating to the Edinburgh theatre. His Lordship accordingly entered judgment for the defendant with costs. Hence the present appeal of the plaintiff.

At the conclusion of the appellants' case their Lordships affirmed the decision of Mr. Justice Bigham and dismissed the appeal with costs.

Mr. Nepean was counsel for the appellant, and Mr. Schillar for the respondent.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

16,981.—A TUNNELLING-SHIELD: *C. G. Hastings.*—A curved cutting-edge is formed by bringing the inner and outer cylinders together in front, a slotted hood being placed at the rear; the hydraulic advancing cylinders, which are held with pivoted yokes to allow of their being turned aside, are laid between trusses which strengthen the partitions of the space between the cylinders, and there are partitions and floors with front cutting-edges that divide the middle part into cells into which deflecting-plates direct the spoil; hinged doors fitted with hinged louvres are arranged in removable bulkheads in front of each of the cells.

17,005.—STOPPING-PIECES FOR EARTHENWARE PIPES AND JUNCTIONS: *R. Ewing.*—The stopper is either joined on to the pipe-socket before the pipe is dried or fired, or cemented to it when the pipe has been fired; the stopper can be chipped away along a groove, as the internal diameter of the flange exceeds the external diameter of the pipe-spigot; the invention will serve for a socket, having an annular shoulder as is specified in Nos. 9,360 of 1891, and 30,241 of 1897.

17,008.—APPLIANCES FOR WINDOW SASHES: *W. K. Lee.*—At the lower ends of sliding stiles, secured to the cords, are pivots or studs about which the sashes can be turned. Pivoted catches will hold the sliding stiles as the sashes are being taken out of the frames, and thumb-screws in screwed plates fasten the stiles to the sashes.

17,029.—A CONTRIVANCE FOR USE WITH WINDOWS: *R. Vachell.*—The inventor's object is to obviate the risk of trapping one's hand between the sill and the falling sash. He attaches stops to the frame beneath the upper sash, which will thereby be sustained in the event of the cords being broken.

17,036.—SCALES FOR DRAUGHTSMEN'S USE: *J. Lukowsky.*—Two detachable scales, available for use in enlarging or reducing plans, maps, and so on, are joined together with two end pieces in such a manner that whilst a narrow slit remains between them their zeros shall coincide at a hole, in one end-piece, in alignment with the slit. Transparent material is laid over the drawing or plan, which can then be enlarged or reduced by plotting points from a needle fixed through the hole in either of the two end-pieces.

17,043.—A COMBINED LIQUID AND SPRING DOOR-CHECK: *W. H. Taylor.*—A piston in a closed cylinder that contains the liquid is joined with a connecting-rod to a crank upon a shaft which is joined indirectly to the inner end of a spiral spring, of which the outer end is secured to the casing; a lever from the squared end of the shaft is attached to the door-frame; the piston impels the liquid through a by-pass (a screw-down valve regulating the rate) as the spring closes the door, and the door can be caused to shut either slowly or quickly by an adjustment of the angular relation between the piston and the shaft-lever. The mechanism may avail for right or left hand closing by joining the inner end of the spring to a sleeve which one can lift out with the spring and invert, a feather on the sleeve joining it to another sleeve to which a pawl gearing with teeth upon the flange connects the lever.

17,056.—A MACHINE FOR WORKING WOOD, STONE, METAL, &c.: *J. Midböe.*—The machine is devised for turning, cutting, or boring in connexion with a copying-lathe; a pivoted lever upon a slide is worked by a templet, which is driven from the mandrel by the moving of a pin lengthwise in its guides, an adjustable spring forces a rod against the lever of which the upper end presses against the rod which is secured to the tool-slide; the other slide that carries the pivots of the lever can be moved vertically so as to vary the motion imparted to the tool and thereby change the dimensions of the work.

17,058.—APPLIANCE FOR CHIMNEYS AND STOVE-PIPES: *W. A. Gay and R. D. Argue.*—An inner pipe having hooded openings is carried upon tabs which engage with eyes upon the stove-pipe or lie upon the top of the chimney; the pipe may consist of two separated halves, and a damper be inserted between the two parts or in a contracted outlet formed in the lower half.

17,061.—MEANS OF JOINING WOODEN POSTS TO STONE, CONCRETE, OR METAL: *F. W. Commons.*—In the case of a post fastened with a tubular metallic key to a foundation of stone the end of the post is recessed for taking a damp-proof layer of cement or asphalt and a corrugated hoop-iron band is driven into it, a dowel or wedge serving to expand the wood in the tube; the posts may be built up in sections to be joined together by tubes, dowels, and cross-bolts that are passed through plates of metal.

17,086.—MECHANISM FOR USE IN WORKING CRANES: *W. Deutsch.*—To make the crane turn automatically as the load nearly reaches the height required, a sleeve having screw threads carries the lower pivot of the jib, and on to a bracket of the jib is pivoted the short end of a lever that engages between the threads and has an eye in its longer end through which the jib-rope is passed. As the eye is engaged by the load, or by a projection from the rope, the turning of the lever upon its pivot makes the crane turn around its pivot. In another form the rope is passed from the jib directly to the drum and the screw threads are made on the crane-post.

17,103.—AN APPLIANCE FOR CLEANSING DRAINS: *W. H. Gibbs.*—Obstructions are removed with an appliance that consists of a series of sector-shaped blades, whereof the first is fashioned with a spiral edge, which are threaded spiral-wise upon a flat stem which is fitted with spacing collars.

17,124.—A PROTRACTOR OR GAUGE FOR GAUGING, MARKING-OFF, AND TESTING PURPOSES: *A. J. Lucy and L. H. Turtle.*—The instrument, which is intended to serve also for setting or adjusting tools, marking off and setting out centres, the teeth of wheels, and testing and gauging bevels, comprises a sector, a fixed rule, and a stock. Angular graduations upon the sector mark the position of the rule in respect of the base and one face of the stock, the sector being placed between a rounded seat in the stock and a circular boss, and a stop limiting its movement in one direction. The graduated edge of the rule is passed through the centre of motion of the sector between a slot in the latter and a slot in the screw which clamps the sector in its place. At one end of the rule is a right-angled lug for use in callipering, at its other end is a bevel, and when the rule is at a right angle with the base it will bisect the angle—which should be a right angle—between the equal faces of the stock, the index-line being at the lower end of a scale on the stock.

17,139.—CONVERTIBLE COMPASSES, CALLIPERS, AND DIVIDERS: *H. Terlin.*—The chief novelty consists of providing a fine adjustment by means of a ratchet-toothed sector upon the one leg, that is inserted through a slot in the other leg, with a screw or worm upon a pivoted piece which a spring keeps in or out of engagement with the sector. For describing circles about a cylindrical hole, the radius is set out with a scale having a V-shaped slot and a ball-shaped end, which can be attached to the leg, is put into the hole, and the scale is then caused to slide along until the sides of the V become tangents of the spherical ball. Other adaptations of the instruments are specified, such as dotting-wheels, cutting-blades, and points with cup-shaped ends, that can be attached to the legs in place of points.

17,168.—DOOR LATCHES AND HANDLES: *S. W. Mace.*—The various parts of the latch are stamped out of sheet metal, and the handle is stamped from a blank; a recess in the bottom die corresponds with the shape of the bow, and there is a raised part which will fashion the middle of the handle and corresponds with a recess in the top die. Before the blank is put between the dies it is partly curved upwards, and is then kept in its place with studs projecting from the lower die.

17,211.—CONDUITS FOR ELECTRICAL CONDUCTORS: *L. Marsh.*—The conduits or casings are made of single or multiple troughs into which insulating linings are inserted; a flanged cover, similarly lined and having joints that will overlap, is screwed down on to the supports.

17,233.—BLOCKS OR BRACKETS FOR USE WITH SCAFFOLDING: *R. Brierley.*—Planks upon roofs or other sloping surfaces are carried by wedge-shaped blocks of wood, on the faces of which are metallic plates having inclined spikes that will enter into the woodwork or rafters.

17,285.—WINDOW SASHES AND THEIR FITTINGS: *J. Sewell.*—In order that the sashes may be turned inwards upon occasion, and that the lower sash may be turned outwards for affording ventilation, the inventor hinges the lower halves of the pulley stiles on to the frame. When one wishes to turn the sashes downwards, the guide pulleys of the cords are taken out of recesses in the pulley stiles, and are then forced backwards clear from the sashes. When the sashes slide in the frame, pins that project from the sash stiles and slide in vertical guiding-grooves cut in the lower halves of the pulley stiles retain the sash cords of the lower sash, and a rebate in the fixed portion of the pulley stiles takes the cord. In a variant adaptation the cords are secured to hooks upon the upper ends of the lower sash stiles, the upper sash being kept in its position—when both are turned down—by the engagement of a stop-pin with a groove in the stile of the upper sash. Hinged stays sustain the stiles in a horizontal position, and the latter may be fastened with bolts or other means when they are vertical or are partly opened within the frame.

17,289.—ELECTRICAL SWITCHES: *A. H. Adams.*—In cases where the main switch and rheostat interlock (*see* No. 23,371 of 1899) a loose handle works the main switch arms that engage with the contacts fitted with springs that tend to force the contacts outwards. An arm, having at its one end the armature of the minimum magnet and at its other end a spring, controls the detents which hold the contacts. The arm of the rheostat, held by resistances cut out by a magnet, and the main switch are interlocked by means of an arm, and an overload magnet will short-circuit the electro-magnet in the event of an excess of current.

17,315.—SPRINGS OF LOCKS FOR LATCHES AND SIMILAR PURPOSES: *S. R. Parkes and W. H. Appleby.*—The inventors contrive that the bent portion of each steel spring shall bear against a corner-piece, whilst one end of the spring presses against a projection from the bolt and the other end against a stopping-piece. The corner-piece constitutes one end of the lock-casing, of which the other end and the sides are fashioned in one piece; they also make an additional bend in the spring, for another form of the contrivance, the bend being adapted for engagement with a rounded, half-rounded, or otherwise shaped block, which takes the place of the corner-piece.

17,321.—A FLEXIBLE CONNEXION FOR USE WITH DREDGING APPARATUS: *L. W. Bates.*—The object of the invention is to provide means of connecting the end of a floating discharge-pipe to the dredger; upon the pontoon which supports the end-length of the floating discharge-pipe are guides fitted with brackets, of which the pins will serve as a pivot for another bracket, the latter bracket being linked or jointed to a strut which is secured to the dredger above the dredger discharge-pipe; a ferrule on the bent portion of the pipe is joined to a ferrule at the end of the floating discharge-pipe. Wedge-shaped cylinders can be placed between the parts of the pipe and the sleeve when the two portions of the pipe are employed at a considerable angle the one to the other.

MEETINGS.

FRIDAY, JANUARY 24.

Architectural Association Discussion Section.—Mr. F. G. W. Buss on "The Clerk of Works: His Duties and Responsibilities." 7.30 p.m.

Birmingham Architectural Association.—Mr. Halsey Ricardo on "The Gothic Revival."

Devon and Exeter Architectural Society (Plymouth, Devonport, and Stonehouse Branch)—Annual Dinner.

Glasgow Architectural Craftsmen's Society.—Mr. James Lochhead on "Hospital Planning and Construction." 8 p.m.

SATURDAY, JANUARY 25.

Institution of Junior Engineers.—Seventeenth Anniversary Dinner, at the Hotel Cecil, the President (Sir John Jackson, F.R.S.E.) in the chair. 6.30 p.m.

The Builders' Foremen's Association (Memorial Hall, Farringdon-street, E.C.).—Mr. F. Morgan on "The Solar System."

Dundee Institute of Architecture.—Visit to Perth.

MONDAY, JANUARY 27.

Surveyors' Institution.—Discussion on the paper recently read by Mr. A. Dudley Clarke, and on a paper to be read by Mr. G. S. Mathews, both entitled "The Final Report of the Local Taxation Commission." 8 p.m.

Society of Arts (Cantor Lectures).—Dr. Samuel Rideal on "The Purification and Sterilisation of Water." III. 8 p.m.

Timber Trades Benevolent Society.—Annual Meeting, Cannon-street Hotel, and the election of three pensioners. 11.30 a.m.

TUESDAY, JANUARY 28.

Institution of Civil Engineers.—(1) Mr. G. Davis on "The Sewerage Systems of Sydney, N.S.W., and its Suburbs"; (2) Mr. W. Naylor on "The Bacterial Treatment of Trade Waste." 8 p.m.

WEDNESDAY, JANUARY 29.

Society of Arts.—Mr. Clayton Beadle on "Technical Education as Applied to Paper-making." 8 p.m.

Northern Architectural Association.—Mr. R. P. S. Twizell on "The Development of Architectural Ornament." 7.30 p.m.

THURSDAY, JANUARY 30.

Royal Institution.—Dr. A. S. Murray on "Recent Excavations at Delphi and in the Greek Islands." III. 3 p.m.

Leeds and Yorkshire Architectural Society.—Mr. W. H. Thorp on "An Old Court Quarter of Paris." 6.30 p.m.

FRIDAY, JANUARY 31.

Architectural Association.—Mr. C. Harrison Townsend on "Originality in Architectural Design." 7.30 p.m.

Institution of Civil Engineers (Students' Meeting).—Messrs. J. C. Collett and W. H. C. Clay on "The Quay-Walls of Keysham Harbour." 8 p.m.

SATURDAY, FEBRUARY 1.

Architectural Association.—First Spring Visit, to Christ Church, Brixton-road, by permission of Professor Beresford Pite, the architect of the building.

Sanitary Inspectors' Association.—Nineteenth Annual Dinner. 6.30 p.m.

Edinburgh Architectural Association.—Visits. (1) to Archers' Hall; (2) to Craigmiller Park United Free Church.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 15.—By BRADSHAW, BROWN, & Co.

Stepney.—1, 2, and 3, Ann-st., u.t. 40½ yrs., g.r. 7*l.* 10s. £585

Millwall.—5 and 7, Strafford-st., u.t. 20½ yrs., g.r. 4*l.* 200

383, West Ferry-rd., u.t. 22 yrs., g.r. 2*l.* 10s. .. 120

By MONTAGUE HIBBARD & Co.

Stoke Newington.—10, Dynevor-rd., u.t. 73 yrs. g.r. 6*l.*, r. 34*l.* 370

By FOSTER & CRANFIELD.

Ilford, Essex.—Cranbrook-rd., part of the "Cranbrook Park Building Estate," 25a. 1r. 36p., f. 25,350

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS &c.

	£ s. d.		
Hard Stocks	1 11 6	per 1,000 alongside, in river.	
Rough Stocks and Grizzles.....	1 9 6	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 5 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts ..	1 12 0	,,	,, ,,
Best Fareham Red	3 11 0	,,	,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	per 1,000	at railway depot.
Do., Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 5 6	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers..	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers..	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.

	s. d.		
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0 ,,	,,
Best Portland Cement	32	0	per ton, delivered.
Best Ground Blue Lias Lime..	25	0 ,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. od. per yard, delivered.

Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.	
Bath ,, ...	1 7	,,	,,
Farleigh Down Bath ..	1 8	,,	,,
Beer in blocks	1 6½	,,	,,
Grinshill ,, ...	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks..	2 4	,,	,,
Red Corsehill ,,	2 5	,,	,,
Red Mansfield ,,	2 4	,,	,,
Hard York in blocks ..	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt.	
,, ,, 6 in. Rubbed Ditto..	3 0	,,	,,
,, ,, 5 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 2 in. self-faced Ditto	0 9½	,,	,,
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt.	
,, ,, ,, 6 in. sawn both sides landings	2	7 per ft. super. deld. rly. depôt.	
,, ,, 3 in. do.	1 2½	,,	,,

[*See also page 99.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*Laying-out Pleasure Ground	Aldershot U.D.C.	20*l.*, 10*l.* and 5*l.*	Mar. 1
*Public Offices, Mortuary, Fire Station, &c.	Maldens & Coombe U.D.C.	25*l.* and 10*l.*	Mar. 5
*Proposed Public Offices	Aldershot U.D.C.	100*l.*, 75*l.* and 50*l.*	Mar. 29
*New Town Hall	Harrogate Corporation	150*l.*, 100*l.*, and 75*l.*	May 14

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Making-up Bevington and Warwick-roads	Beckenham U.D.C.	J. A. Angell	Jan. 27
*Road Making and Paving Works	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	Jan. 28
Road Works, Dryden, and other roads	Croydon Town Council	E. Mawdesley, Town Hall, Croydon	do.
Drainage Works, Woodbridge	Guildford & Woking Hospital Brd	E. L. Lunn, Surveyor, 36, High-street, Guildford	do.
*Erection of Buildings at Gasworks	Ashford U.D.C.	Stevenson & Burstal, 38, Parliament-street, Westminster, S.W.	do.
Twenty-two Cottages, Pantyffynon	Tycroes Building Club	D. J. Michael, 9, Wind-street, Swansea	do.
Shop Premises, Great Yarmouth	Mr. Hannant	A. S. Hewitt, Architect, Bank Chambers, Great Yarmouth	do.
Additions to Gasworks	Ashford (Kent) U.D.C.	Stevenson & Buratall, Engineers, Parliament-street, S.W.	do.
Two Houses and Stables, Beeston, Yorks	Mr. W. L. Ingle	Buttery & Birds, Architects, Queen-street, Morley	do.
Technical Institute, Beam-street	Nantwich U.D.C.	C. E. Davenport, Architect, Nantwich	do.
Alterations, &c., to Woodlands Farm	Guildford R.D.C.	E. L. Lunn, Architect, 36, High-street, Guildford	do.
*Supply of Flints and Cockle-shells	London County Council	Parks Department, 11, Regent-street, S.W.	Jan. 29
Shops, &c., Hessle-road, Hull	North Eastern Railway Company.	W. Bell, York	do.
Additions to Schools, Cornwall	St. Agnes School Board	Carder & Carder, 4, Princes-street, Truro	do.
Synagogue and Schools, Hull	Messrs. Greene & Company	B. S. Jacobs, Architect, Bowlalley-lane, Hull	do.
House, &c., High-street, Haverhill, Suffolk	Orsett (Essex) R.D.C.	A. A. Hunt, Architect, Sudbury	do.
Street Works, Chadwell	North-Eastern Railway Company.	F. Lowry, Civil Engineer, Hornchurch, Essex	do
Station Buildings, Pegswood, Northumberland	East Stow R.D.C.	W. Bell, Central Station, Newcastle-on-Tyne	do.
Artesian Well, Haughley	Croom, &c., Co.-op. Dairy Soc., Ld	R. E. Wilkes, Stowmarket	do.
Creamery	Reading Corporation	J. Hickey, Croom, County Limerick	do.
Alterations to Business Premises, Londonderry	Meltham (Yorks) U.D.C.	J. P. M'Grath, Civil Engineer, 23, Carlisle-road, Londonderry	do.
Road Improvement Works, Maitland-road	Kingston-on-Thames Guardians	J. Bowen, Borough Surveyor, Town Hall, Reading	Jan. 30
Sewage Works	Essex County Council	J. B. Abbey & Son, Civil Engineer, 34A, New-street, Huddersfield	do.
Additions to Infirmary, Bradford	Lytham (Lancs) U.D.C.	Milnes & Frances, Architects, Bradford	do.
Porter's Lodge, &c.	Bucks County Council	J. Edgell, Union Offices, Kingston	do.
Bridge, Purleigh	Celbridge Guardians	P. J. Sheldon, Civil Engineer, Duke-street, Chelmsford	Jan. 31
Fire Station, The Crescent, Salford	St. George-in-the-East Guardians	H. Kirkley, Architect, 134, Deansgate, Manchester	do.
Buildings	Glasgow Parish Council	A. J. Price, Engineer, Council Offices, Lytham	do.
Granite Road Metal (16,000 tons), Aylesbury	Sleaford (Lincs) U.D.C.	R. J. Thomas, County Surveyor, Aylesbury	do.
Two Houses, Thurlstone	Hayfield Guardians	G. Moxon, Architect, 26, Church-street, Barnsley	do.
Heating Infirmary	Gwyrfai (Wales)	J. Whelan, Architect, Celbridge	do.
*Alterations and Sanitary Works at Infirmary	Norfolk County Council	G. A. Wilson, Architect, Hopetoun House, Lloyd's-avenue, E.C.	do.
Hospital, Oak Bank	Penistone R.D.C.	A. Cullen, Architect, 45, Hope-street, Glasgow	Feb. 1
Broken Granite (1,000 tons)	Fife County Council	E. Clements, Council Offices, Sleaford	do.
Additions to Workhouse, Low Leighton, New Mills	Stirling County Council	Garlick & Flint, Architects, 5, Terrace-road, Buxton	do.
Water-supply Works	Merthyr Tydfil U.D.C.	E. Evans, Civil Engineer, 8, Castle-street, Carnarvon	do.
Granite Road Metal	Darlington Corporation	T. H. B. Heslop, Civil Engineer, Norwich	do.
Drainage Works, Silkstone, Yorks	Walmer Estates, Co., Ltd.	Marriott & Co., Civil Engineers, Dewsbury	do.
Bacteria Beds, Crossgates, Dunfermline	Hendon U.D.C.	D. Mackenzie, Civil Engineer, County Buildings, Dunfermline	Feb. 3
Waterworks, Falkirk	Market Harborough U.D.C.	Warren & Stuart, Civil Engineers, 94, Hope-street, Glasgow	do.
One hundred Houses, Penydarren	Hackney Borough Council	T. A. Rees, Town Hall, Merthyr	do.
Farmhouse, Shenfield, Essex	Acton District Council	L. H. Marshall, Surveyor, Chippenham	do.
Two Cottages	Southend Corporation	Borough Surveyor, Town Hall, Darlington	do.
*New Sewers and Roads, Walmer	Norwich Corporation	Hinds & Son, Estate Agents, Walmer	do.
*Annual Contracts	Newport (Mon.) Council	Council's Engineer, Public Offices, Hendon	do.
N. T. Rails and Gates	Dartford U.D.C.	H. G. Coales, Civil Engineer, Market Harborough	Feb. 4
*Hardwood Paving	Kettering U.D.C.	Borough Engineer, Town Hall, Hackney	do.
*Making-up Southfield-road	Leeds Corporation	D. J. Ebbetts, 242, High-street, Acton, W.	do.
Wall, &c., at Sanatorium	do.	A. Fidler, Civil Engineer, Southend	do.
*New Picture Gallery	Panteg U.D.C.	A. E. Collins, Guildhall, Norwich	Feb. 5
*Power Station and Car Sheds	Lathom & Burscough U.D.C.	Borough Engineer, Town Hall, Newport, Mon.	do
Kerbing, &c., St. Alban's-road	Wolverhampton Tramways, Ltd.	W. Harston, Surveyor, 8, Hythe-street, Dartford	do.
Granite Road Metal	West Ham Council	C. W. Lane, Kettering	do.
House, Crumlin, Mon.	do.	R. L. Roberts, Architect, Abercarn	Feb. 7
Police Station, Harrogate-road	Southall Norwood U.D.C.	W. H. Thorp, Architect, 61, Albion-street, Leeds	Feb. 8
Free Library, Chapeltown	Great Western Railway Company	do.	do.
*Re-Erecting the Crown Bridge near Griffithstown	Lambeth Borough Council	D. J. Lougher, Engineer, Pontypool	Feb. 10
*Sewage Disposal Works	Stamford Corporation	John T. Wood, Engineer, 3, Cook-street, Liverpool	do.
*Car Sheds and Offices, &c., Bilston	Stamford Corporation	The Secretary, Donington House, Norfolk-street, W.C.	do.
*Tenders for Supplies, &c.	Bristol Docks Committee	Borough Engineer, Town Hall, Stratford, E.	Feb. 11
*Tenement Houses, Stratford	Stepney Council	Borough Engineer, Town Hall, West Ham, E.	do.
*Isolation Hospital	Hornsey U.D.C.	Council Offices, Southall, Middlesex	do.
*Extension of Goods Shed, &c., Plymouth	The Visiting Committee	Engineer, North-road Station, Plymouth	do.
*Annual Contracts	Kingston Union	Borough Engineer, Town Hall, Kennington Green, S.E.	Feb. 13
Engine House, Cottage, &c., Albert-road	Messrs. Robertshaw & Sons	J. B. Everard, Civil Engineer, 6, Millstone-lane, Leicester	Feb. 17
*Main Drainage Works, New Sewers, &c., &c.	Messrs. Hogge & Seppings	Engineer's Office, 6, Millstone-lane, Leicester	do.
*New Docks and Works, Avonmouth		Engineer's Office, Underfall Yard, Bristol	do.
*Block of Artizans' Dwellings		Borough Engineer, 15, Great Alie-street, Whitechapel, E.	Feb. 18
*18-in. Stoneware Pipe, Outfall Sewer, &c.		E. J. Lovegrove, Southwood-lane, Highgate, N.	Feb. 24
*Alterations to Bracebridge Asylum		Giles, Gough & Trollope, 28, Craven-street, Strand, W.C.	Mar. 3
*New Buildings and Alterations and Additions		Not stated	No date
Boiler House, &c., Droylsden, Lancs.		George & Sons, Architects, Ashton-under-Lyne	do.
Alterations to Orton Hall Farm, Great Orton		Carrick, Lee & Sons, Carlisle	do.
Cottage, Porthcawl		S. H. Stockwood, Bridgend	do.
House, Longmore, near Elgin		R. B. Pratt, Architect, County Bank House, Elgin	do.
Rebuilding the King's Arms Hotel, Litcham, Norfolk		L. F. Eagleton, Architect, Bank Chambers, King's Lynn	do.
Shops, South Hetton, Durham		R. Hogg, Murton Colliery, Durham	do.
Four Cottages, Shields-road, Pelaw		J. E. L. Harris, Architect, 1, Balloon-street, Manchester	do.
Boundary Walls, Burnley-road, Halifax		W. H. D. Horsfall, Architect, Tower Chambers, Halifax	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*Master of Buildings	Liverpool School Board	250*l.*	Jan. 30
*Road Surveyor	*Hackney Borough Council	182*l.*	Feb. 4
*Clerk of Works	*Bradford Corporation	120*l.*	Feb. 5
*Architectural Assistant	Sheffield Corporation	150*l.*	do.
*Building Inspector	West Ham Council	150*l.*	Feb. 12

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. xii. & xxii. Public Appointments, xviii. & xxii.

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PRICES CURRENT (*Continued*).

SLATES.

in.	in.	£	s.	d.	
20×10 best blue Bangor		11	15	0	per 1000 of 1200 at ry. dep.
,, best seconds	,,	11	5	0	,, ,,
16× 8 best	,,	6	12	0	,, ,,
20×10 best blue Portmadoc		11	5	0	,, ,,
16×8 best blue Portmadoc		6	0	0	,, ,,
20×10 best Eureka unfading green		12	2	6	,, ,,
16× 8 ,,	,,	7	5	0	,, ,,
20×10 permanent green		10	5	0	,, ,,
16×8 ,,	,,	5	17	6	,, ,,

TILES.

	s.	d.	
Best plain red roofing tiles	41	6	per 1,000, at rly. depôt.
Hip and valley tiles	3	7	per doz. ,, ,,
Best Broseley tiles	48	6	per 1,000 ,, ,,
Hip and valley tiles	4	0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57	6	per 1,000 ,, ,,
Do. ornamental Do.	60	0	,, ,, ,,
Hip tiles	4	0	per doz. ,, ,,
Valley tiles	3	9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50	9	per 1,000 ,, ,,
Hip tiles	4	1	per doz. ,, ,,
Valley tiles	3	8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13	10	0	15	10	0
Deals: best 3 by 9	13	0	0	14	10	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	10	0	0	11	0	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best		
Battens: seconds	0	10	0	,, ,, ,,		
2 in. by 4 in. and 2 in. by 6 in.	8	10	0	9	10	0
2 in. by 4½ in. and 2 in by 5 in.	8	0	0	9	0	0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0	10	0	more than battens.		
¾ in.	1	0	0	,,		
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Swedish balks	2	15	0	3	0	0
Pitch-pine timber (30 ft.)	3	0	0	3	10	0

JOINERS' WOOD.

	At per standard.					
White Sea: First yellow deals, 3 in. by 11 in.	22	0	0	23	0	0
3 in. by 9 in.	20	0	0	21	0	0
Battens, 2½ in. and 3 in. by 7 in.	15	0	0	16	0	0
Second yellow deals, 3 in. by 11 in.	17	0	0	18	0	0
,, ,, 3 in. by 9 in.	15	10	0	16	10	0
Battens, 2½ in. and 3 in. by 7 in.	12	0	0	13	0	0
Third yellow deals, 3 in. by 11 in. and 9 in.	12	10	0	13	10	0
Battens, 2½ in. and 3 in. by 7 in.	10	10	0	11	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	19	0	0	20	0	0
Do. 3 in. by 9 in.	16	0	0	17	0	0
Battens	12	10	0	13	0	0
Second yellow deals, 3 in. by 11 in.	14	0	0	15	0	0
Do. 3 in. by 9 in.	13	0	0	14	0	0
Battens	11	0	0	12	0	0
Third yellow deals, 3 in. by 11 in.	11	10	0	12	10	0
Do. 3 in. by 9 in.	11	0	0	12	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	13	10	0	14	10	0
,, ,, ,, 3 in. by 9 in.	12	10	0	13	0	0
Battens	10	10	0	11	10	0
Second white deals 3 in. by 11 in.	12	10	0	13	10	0
,, ,, ,, 3 in. by 9 in.	12	0	0	12	10	0
,, ,, ,, battens	9	10	0	10	10	0
Pitch-pine: deals	16	0	0	18	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes	32	0	0	33	10	0
Broads (12 in. and up)	2	0	0	more.		
Oddments	22	0	0	24	0	0
Seconds, regular sizes	24	10	0	26	10	0
Yellow Pine Oddments	20	0	0	22	0	0
Kauri Pine—Planks, per ft. cube	0	3	6	0	4	6
Danzig and Stettin Oak Logs—Large, per ft. cube	0	2	6	0	3	0
Small ,, ,,	0	2	3	0	2	6
Wainscot Oak Logs, per ft. cube	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	8	0	0	7
¾ in. do. do.	0	0	7	-	-	-
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	16	0	0	20	0	0
American Whitewood Planks— Per ft. cube	0	3	0	0	3	6
Prepared Flooring—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	0	0	16	6
1 in. by 7 in. yellow, planed and matched	0	13	6	0	17	6
1¼ in. by 7 in. yellow, planed and matched	0	15	0	1	0	0
6 in. at 6d. per square less than 7 in.						
1 in. by 7 in. white, planed and shot	0	11	0	0	12	6
1 in. by 7 in. white, planed and matched	0	11	6	0	13	6
1¼ in. by 7 in. white, planed and matched	0	13	6	0	15	6
6 in. at 6d. per square less than 7 in.						

PRICES CURRENT (*Continued*).

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	6	5	0	7	5	0
Compound Girders ,, ,,	8	0	0	9	0	0
Angles, Tees and Channels, ordinary sections	8	2	6	9	2	6
Flitch Plates	8	10	0	0	0	0
Cast Iron Columns and Stanchions, including ordinary patterns	7	0	0	8	0	0

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON— Common Bars	8	0	0	8	10	0
Staffordshire Crown Bars, good merchant quality	8	10	0	9	0	0
Staffordshire "Marked Bars"	10	10	0	-	-	
Mild Steel Bars	9	0	0	9	12	0
Hoop Iron, basis price	9	5	0	9	15	0
,, ,, galvanised	16	0	0	-	-	-
(* And upwards, according to size and gauge.)						
Sheet Iron, Black.— Ordinary sizes to 20 g.	10	0	0	-	-	-
,, ,, to 24 g.	11	0	0	-	-	-
,, ,, to 26 g.	12	10	0	-	-	-
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12	10	0	-	-	-
,, ,, 22 g. and 24 g.	13	0	0	-	-	-
,, ,, 26 g.	14	0	0	-	-	-
Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g.	16	10	0	-	-	-
,, ,, 22 g. and 24 g.	17	0	0	-	-	-
,, ,, 26 g.	18	10	0	-	-	-
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12	10	0	-	-	-
,, ,, 22 g. and 24 g.	13	0	0	-	-	-
,, ,, 26 g.	14	0	0	-	-	-
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12	5	0	-	-	-
,, ,, 22 g. and 24 g.	13	5	0	-	-	-
,, ,, 26 g.	14	5	0	-	-	-
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9	10	0	10	0	0

LEAD, &c.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3 lbs. & up.	12	15	0	-	-	-
Pipe in coils	13	5	0	-	-	-
Soil Pipe	15	15	0	-	-	-
ZINC—Sheet— Vieille Montagne ton	24	10	0	-	-	-
Silesian	24	0	0	-	-	-
COPPER— Strong Sheet per lb.	0	1	0	-	-	-
Thin ,,	0	1	1½	-	-	-
Copper nails ,,	0	1	1½	-	-	-
BRASS— Strong Sheet ,,	0	0	11	-	-	-
Thin ,, ,,	0	1	1	-	-	-
TIN—English Ingots ,,	0	1	3	-	-	-
SOLDER—Plumbers' ,,	0	0	6½	-	-	-
Tinmen's ,,	0	0	8	-	-	-
Blowpipe ,,	0	0	9	-	-	-

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d. per ft. delivered.
,, fourths	2¼d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths	3¼d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, fourths	4¼d. ,, ,,
32 oz. thirds	5¼d. ,, ,,
,, fourths	5¼d. ,, ,,
Fluted sheet, 15 oz.	3¼d. ,, ,,
,, 21 ,,	4¼d. ,, ,,
½ Hartley's Rolled Plate	2¼d. ,, ,,
⅜ ,, ,, ,,	2¼d. ,, ,,
¼ ,, ,, ,,	2¾d. ,, ,,

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	2	8
,, ,, ,, in barrels	,,	0	2	9
,, ,, ,, in drums	,,	0	2	11
Boiled ,, ,, in pipes	,,	0	2	10
,, ,, ,, in barrels	,,	0	2	11
,, ,, ,, in drums	,,	0	3	1
Turpentine, in barrels	,,	0	2	3
,, in drums	,,	0	2	6
Genuine Ground English White Lead	per ton	21	0	0
Red Lead, Dry	,,	21	0	0
Best Linseed Oil Putty	per cwt.	0	8	6
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Elastic Copal Varnish for outside work	0	16	6
Best Elastic Copal Varnish for outside work	1	0	0
Best Elastic Carriage Varnish for outside work	0	16	0
Best Hard Oak Varnish for inside work	0	10	6
Best Extra Hard Church Oak Varnish for inside work	0	10	6
Fine Hard Copal Varnish for inside work	0	16	0
Best Hard Copal Varnish for inside work	1	0	0
Best Hard Carriage Varnish for inside work	0	16	0
Extra Pale Paper Varnish	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
Best French and Brush Polish	0	10	0

TO CORRESPONDENTS.

J. B.—T. B. T. (Amount should have been stated.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ASPATRIA (Cumberland).—For the erection of a shop, hall, &c., for Messrs. T. Watson & Sons. Mr. W. G. Scott & Co., architects, Victoria-buildings, Workington:—

Full Tender.

H. Finnion, Contractor, Flimby £988 0

Ironwork.

Workington Wagon & Engineering Co., Workington 31 14

£1,019 14

BLAENLLECHAU (near Pontypridd).—For additions to the Blaenllechau Radical Club. Messrs. Griffiths & Jones, architects, Tonypandy and Cardiff:—

J. Ll. Prothero, contractor, Ferndale, near Pontypridd* £615 10 6

BLAINA (Mon.).—For the erection of school buildings, Cwmcelyn, for the Aberystruth School Board. Mr. R. L. Roberts, architect, Abercarn. Quantities by architect:—

D. W. Richards	£2,990 0	D. Powell	£2,635 10
Dd. Lewis	2,800 0	J. Jenkins	2,527 0
W. Phillips	2,756 0	J. Lloyd	2,454 10
A. P. Williams	2,695 0	M. Jenkins	2,448 18
T. Westacott	2,692 10	J. Newcombe, Ebbw Vale*	2,400 0
D. J. Davies	2,679 0		

BUCKHURST HILL (Essex).—For bacteria beds, storm overflow sewer, &c. Mr. H. Tooley, surveyor Council Offices, Buckhurst Hill:—

J. & T. Binns	£2,021	G. F. Tomlinson	£1,450
W. Coker	1,898	Wilkinson Bros.	1,400
G. Bell	1,823	W. & C. French, Buckhurst Hill*	1,390
Clift Ford	1,740	W. Manders	1,312
F. J. Coxhead	1,560		

BURNLEY.—For the execution of sewage disposal works (extension of tank) for the Rural District Council Mr. S. Edmondson, Surveyor, 18, Nicholas-street, Burnley:—

Ormerod Bros.	£341 3	Cunliffe & Sons	£255 0
J. Wadge	313 16	Berry & Son	220 12
J. & G. Durbury	290 17	Mullen & Durkin, Burnley*	212 0
Clegg Bros.	299 18		

CARDIFF.—For the erection of a car depot, Newport-road, Roath, for the Corporation. Mr. W. Harpur, C.E., Town Hall, Cardiff. Quantities by the Borough Engineer:—

Turner & Sons	£27,032	Symonds & Co.	£23,396
Allan & Sons	25,867	W. T. Morgan	23,126
Evans Bros.	24,478	Lattey & Co.	22,867
Thomas & Sons	24,342	D. W. Davies*	21,998

[All of Cardiff.]

CARDIFF.—For the execution of bridge works for the Corporation. Mr. W. Harpur, C.E., Town Hall, Cardiff. Quantities by the Borough Engineer:—

Frank Ashley	£5,026 1 7	D. W. Davies	£3,824 0 0
Allan & Sons	4,805 4 3	W. T. Morgan	3,760 13 8
Lattey & Co., Ltd.	4,678 10 8	Charles Davies*	3,576 3 5
Turner & Sons	4,484 0 1		

[All of Cardiff.]

CHINGFORD.—For the remainder of roads and sewers on the Rowden Park Estate, Chingford. Mr. T. Wilson, surveyor, 34, New Bridge-street, E.C.:—

French	£3,977	Killingback & Co.	£3,682
Rogers & Co.	3,944	Eli Wilson, Walthamstow*	3,508
Neave & Co.	3,786		

DARTMOUTH.—For alterations to Royal Union inn, for the Plymouth and Torquay Breweries, Ltd. Messrs. E. Appleton & Son, architects, 10, Abbey-road, Torquay. Quantities by Mr. C. Savill Appleton, Paignton:—

Webber & Sons	£683 0	E. Pike	£544 18
Yeo & Sons	630 0	Back & Watts, Dartmouth*	528 0
Rowe & Pillar	610 0		

HORLEY.—For building a pair of cottages and accident ward on the Gatwick racecourse, Horley, Surrey, for Gatwick, Ltd. Messrs. Holland & Sons, architects, Newmarket. No quantities:—

Cheal & Son	£897 10	A. E. Jennings, Horley, Surrey*	£780 0
King & Son	796 10		

[*See also next page.*

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HENDON.—For fully making up, under Section 150 of the Public Health Act, 1875, the following streets, and for urface water drainage, for the Urban District Council of Hendon. Mr. S. Slater Grimley, Engineer and Surveyor :—

—	Russell-road.	Herbert-road.	Algernon-road.	Finchley-road, S.W.D.	Parson-street, S.W.D.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
H. Boyer	941 0 0	1,091 0 0	2,786 0 0	2,222 0 0	559 0 0	6,999 0 0
Clift Ford	699 19 3	820 12 9	1,673 18 3	1,864 14 6	487 9 6	5,546 14 3
T. Adams	610 9 6	691 8 0	1,481 0 0	1,647 18 6	669 3 6	5,099 19 6
Meston & Hale	533 19 10	623 0 5	1,328 1 0	1,752 14 6	551 15 0	4,789 10 9
Griffiths & Co.	579 5 3	761 17 3	1,576 13 0	1,397 3 0	411 6 0	4,666 4 6
Ballard, Ltd.	571 5 0	651 1 3	1,389 16 6	1,374 18 6	518 5 0	4,505 6 3
D. R. Paterson	547 0 9	617 11 10	1,323 0 0	1,404 12 10	500 6 0	4,392 11 5
E. J. Bloomfield	592 0 0	681 10 8	1,390 8 6	*1,199 1 4	*401 9 0	4,264 9 6
Killingback & Co.	*516 0 0	*598 17 6	*1,247 0 7	1,456 19 6	448 5 9	4,267 3 4
Engineer's Estimate	579 17 9	672 3 10	1,383 14 2	1,266 1 4	380 17 10	4,282 14 11

* Recommended by the Works Committee for acceptance.

IPSWICH.—For additions to laundry at fever hospital, Foxhall-road. Mr. E. Buckman, Borough Surveyor, Town Hall, Ipswich :—

C. Roper	£385 5	W. H. Death, Ipswich*	£274 0
C. Bonett	340 0		
A. Anis	300 0		

LONDON.—For foundations for new cold stores, Green Bank and Morgan's-lane, Tooley-street, S.E., for the London Cold Storage, Ltd. Mr. W. H. Waterman, architect, 7, Cullum-street, E.C. :—

Squire & Co.	£16,278 0 0	Fortescue & Sons	£13,293 0 0
J. T. Firbank	14,452 3 10		
Mowlem & Co.	14,063 0 0		

MALMESBURY (Wilts).—For the erection of technical and secondary schools, for the Malmesbury and District Technical Educational Committee. Mr. Robert E. Brinkworth, architect, Chippenham :—

F. Hughes	£4,415 0	A. J. Colborne	£3,776 11
Downing & Rudman	3,907 0	William Beazley, Calne*	3,220 0
Smith & Light	3,833 0		

[Architect's estimate, £3,700.]

MOUNTAIN ASH (Wales).—For the execution of street improvement works, Duffryn-street, &c., for the Urban District Council :—

J. John, Cliff Cottage, Mountain Ash £218 17 6

NARBERTH (Pembrokeshire).—For erecting four houses at Narberth, for Mr. J. Phillips. Messrs. Griffiths & Jones, architects, Tonypandy and Cardiff :—

Brown Brothers, Gwyther-street, Pembroke Dock* £840

ST. BUDEAUX (Devonshire).—For the erection of a school and boundary walls, Honicknowle, for the School Board of St. Budeaux. Mr. T. R. Kitsell, architect, 1, George-street, Plymouth :—

Roach & Lovell	£5,388	Geo. Hoskin	£4,100
W. T. Stevenson	4,650	Bennett & Quick	3,836
J. Paynter	4,545	Allen & Tozer	3,731
W. J. Goad	4,477	A. Andrews	3,610
W. E. Blake	4,373	A. J. Jewell	3,535
F. C. Ambrose	4,311	John Dary, Compton†	3,450
A. N. Coles	4,176		

SUTTON (Surrey).—For new public baths, Throwley road, Sutton, Surrey, for the Urban District Council. Messrs. Saville & Martin, architects, Dacre House, Arundel-street, W.C. :—

Walter Wallis	£7,591	Smith & Sons	£6,879
Longley & Co.	7,589	J. B. Potter	6,858
Chas. Ansell	7,474	Sabey & Son	6,689
J. Christie	7,270	Courtney & Fairbairn	6,629
Cropley Bros.	7,100	Duncan Stewart & Son	6,588
Jones & Son	7,098	Viney & Stone	6,563
Maple & Co.	6,949	Martin, Wells, & Co.*	6,299
Turtle & Appleton	6,938		

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VOL. LXXXII.—No. 3078. FEBRUARY 1, 1902.

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Beyrout.

THE old-time semi-savage towns collected round the landing-places or "scale" of the Eastern Mediterranean shores are passing away. Turko-Arab barbarism is gradually melting before the influences of civilisation, and in the very midst of the Nearer East the excellent port built by French enterprise in 1895-1900 has raised Beyrout from a mere agglomeration of rich natives' houses (filled with women and slaves), the Consulates, and a few traders' stores, into the position of a thriving and important city. The Arab slums of former days are of course still very much in evidence, but the large European houses and business premises built round the port are encroaching on the adjoining filthy hovels and lanes, and the leaven of enterprise and commercial development is working wonderfully. Beyrout illustrates the strange fusion of Eastern and Western ideas which can only be found in full force in Turkey.

A most singular feature in the civilisation of Beyrout is the total absence of the civic organisation associated with such events in other lands. Certainly there is a "medglis," or town council, partly elected by suffrage of Ottoman subjects, Christian as well as Mohammedan. But such an organisation, in which all the foreign elements of the community, who represent the wealth and intelligence, are excluded, is naturally of very little value for practical municipal work. There is no regular civic corporation responsible for the public welfare, no Government commission is charged with improvements, and not even the element of any committee of influential inhabitants enters into the question. A city of 200,000 inhabitants manages to exist in a flourishing fashion with merely a nominal administration representative of the minority, and under the control of the innately corrupt Turkish Government.

Everything in Beyrout naturally reflects that characteristically selfish mode of life which is inseparable from Mohammedan institutions. There is no conception of co-operation for mutual welfare, no public spirit, no union of common interests for a common good. Every man seizes and holds such property as he can come by in any way, and his one idea is always to surround such property with barriers of defence, on the outside of which any trifling display of his possessions is always of the most cautious and guarded kind. As a consequence this is a country where real public works are practically unknown, and anything in the shape of a monument or object of public utility—a mosque, a bridge, a drinking-fountain—is merely the result of individual caprice and desire for display. Such monuments are, of course, never repaired or re-erected when once they are decayed or destroyed. Roads may be said to hardly exist with the exception of the famous Damascus-Beyrout road, made and maintained by the French Diligence Co. since 1860. This company, afterwards merged into the railway company, still owns the road, but the older work is now no longer sustained as formerly, and the greater part of it has lapsed after the last few winters into a ruin. Under these circumstances, all the imposing modern buildings which are springing up in Beyrout and its suburbs have an old and anomalous effect to a European accustomed to the properly laid-out streets, well-made roads, &c., of a civilised town.

As an illustration of the shocking disregard for the welfare of the community displayed by the Turkish officials of such a town as Beyrout, a most terrible accident last year occurred in one of the quite European quarters of the city. A three-storied house, built a few years back, falling down, killed forty-seven persons. The property belonged to a Mohammedan speculative builder. As there is no real or effective control over the erection of such buildings in modern Turkey, and the "jerry builders" are now a good deal occupied in providing houses in a supposed European style for the Europeanised natives, many more of these disasters may unfortunately be looked for in the near future. At present the influences of the "evil eye" and "kismet" seem supposed to sufficiently explain the cause of such disasters.

The natives of Syria are comparatively poor; the small amount of wealth existing in the country is very fairly distributed, and although there are few beggars compared with a European district of similar proportions, the number of families living in affluence is very small indeed. This is due to several causes—the insecurity of property, simplicity of life, want of energy on the part of the natives, and, perhaps more than anything else, to the enervating influences of a warm climate, which has a deteriorating effect on humanity in all parts of the globe. At the same time it must be admitted that a certain amount of native enterprise is observable in Beyrout, fostered by the presence of the Corps of Foreign Consuls, who in the Levant occupy a quite different position from that of mere commercial agents, such as are found in other countries, for here they are viewed as protectors from Turkish officialism.

In Levantine countries the Jewish race is, perhaps, the most important factor in social development. Thanks to the numerous Jewish immigration societies founded in the seventies and eighties by English and other Protestant enthusiasts, the whole face of Palestine and some part of Syria has been changed. Instead of a sleepy, uncared-for province of the Turkish Empire, with a limited population of Arabic-speaking "felaheen" under the rule of a patriarchal Government, many of the officials of which were genuine Turks from Constantinople in former times, the country has now become a centre of colonial activity unlike that of any other part of the world. And this remarkable change has taken place since the introduction of the Jewish colonies at the time of the Mansion House Relief Fund. Now, in addition to

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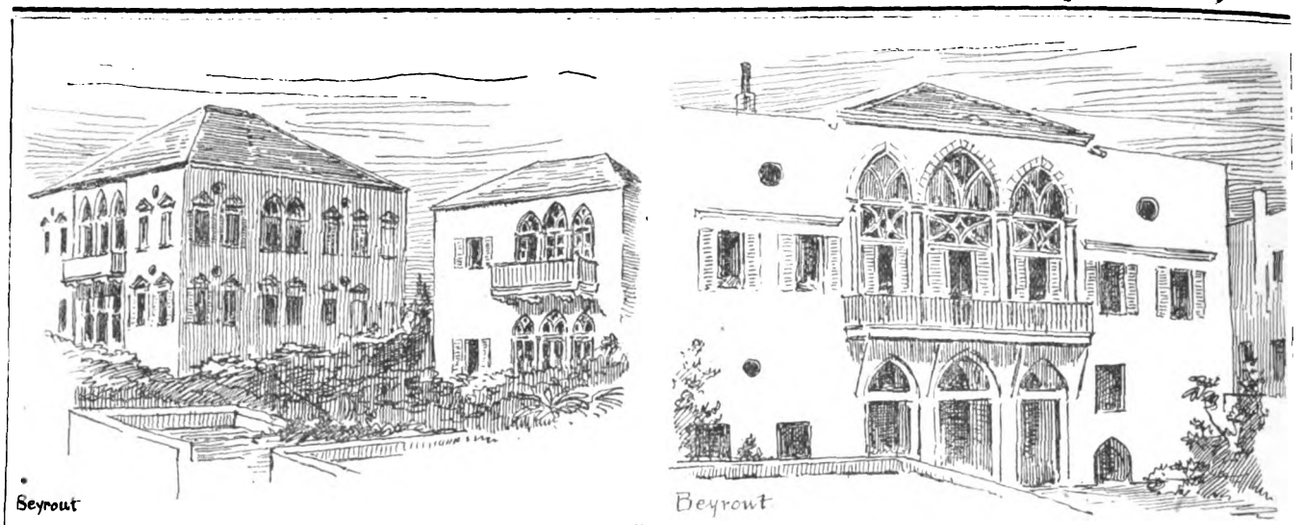

Fig. 2.

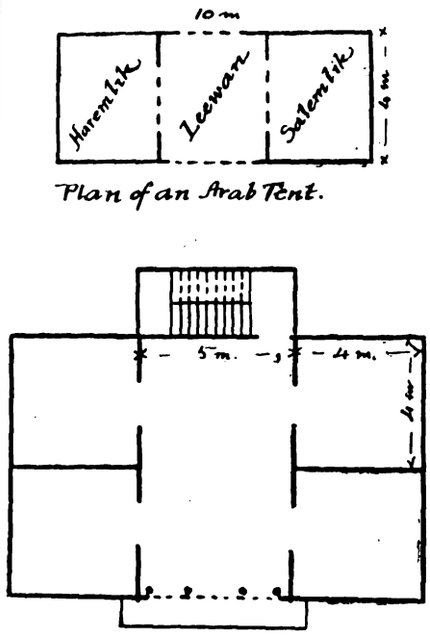

Fig. 1.

the Jews, there are flourishing settlements of Germans and Americans everywhere, and some evidences of Russian influence; but the most noticeable addition to the modern population of the country is, perhaps, the great and increasing influx of Mohammedan refugees from countries whence they are being ousted by Christians. The Jewish element in Beyrout is, as might be expected, greatly evidenced by the large new places of business belonging to Jewish traders with more or less European names. One of the largest and most imposing of these establishments is an enormous store for the sale of every conceivable article for household use or wearing apparel, resembling the famous "Fratelli Bocconi" shops of Italy or the "Magasins du Louvre." It stands on the quay of the new port, and although hardly to be criticised from an architectural point of view, its immense stone front, plate-glass windows, and Parisian appearance create a very astonishing effect on the mind of the traveller returning to Beyrout after the lapse of ten years.

Many of the enormous new villas built by bankers, and traders in the suburbs are remarkable for certain peculiarities of structure. Like most Levantine houses, they are planned with the object of obtaining the largest possible rooms, and not with any apparent conception of the necessity for scientific or hygienic arrangement in a house. They are always built on one model, that of the Arab Bedaween tent (fig. 1)—a large central chamber which serves for entrance hall, reception and dining room, and is also the only means of communication with the bedrooms which open out on either side. In these houses passages are unknown, and the staircase to the upper floor seems to prove so much a puzzle to the builders that it is generally left outside the building; in fact, added after the house is otherwise complete. It is very remarkable that not the least variation in this style of house-plan (which has also been in use for untold centuries) can be detected in the whole of Beyrout. No Englishman or other European seems ever to have built a house on these shores with the civilised arrangement of rooms for various purposes connected by passages. The native type prevails in the poorest hovels as well as in the comparatively grand villas of the bankers. In some of the more important houses the great central chamber, always on the upper floor, is constructed on an almost colossal scale. It is sometimes as much as 25 ft. wide, about 30 ft. high to the ceiling, and 50 ft. or more long. The effect is that of a baronial hall with large chambers leading out on either side. One end is always furnished with a balcony (fig. 2) and at the other is a more or less unsatisfactory arrangement for a staircase, which is generally external to the house and protected by a lean-to. The lower apartments are always sacrificed to the exigencies of supporting the heavy stone floor of these very large rooms above, which in their turn are covered by ceiled roofs of the flimsiest construction. The flimsiness of modern roofs has been immensely increased by the introduction of the so-called "French" tiles, which now give so different a character to Levantine towns from the old-fashioned flat-roofed style of only a few years back. So, although the plans of these houses remain the same as they were in remote ages, their external appearance has been modified to an extraordinary extent. The very primitive habits of the Levantine people have much to do with the extreme simplicity of their architecture. Even in houses inhabited by the richest bankers of Beyrout and the affluent Europeans also adopt the native fashions) there is no idea of apportioning certain rooms to particular uses. The meals of the family (dinner parties are unknown) are served in the great central hall or "lewan" of the house, and there also receptions are held, and the general family life centres. Private sitting or withdrawing rooms are rare, and the side rooms leading out of the "lewan," called the "divans," are always used as bedrooms. Sometimes the kitchen is on the upper floor of the house, sometimes a detached building.

Sanitation in warm climates is, and always has been, a problem. In these modern semi-European, semi-Asiatic countries it is chiefly noticeable by its absence, and such matters remain in an absolutely primitive condition. It is needless to say that main drainage, or indeed any kind of drainage, is quite unthought of in Beyrout, although there is a regular water supply provided by an English waterworks company. Beyrout is also supplied with gas by another English company.

Very little can be said of the appearance of a modern architectural Levantine town from a purely artistic point of view. The efforts to beautify the buildings which are being erected to supply modern requirements—public or private—are deplorable in the extreme. Such efforts are naturally confined to the feeblest reproductions possible of the well-worn European types associated with the last century, but applied in a manner which shows a total ignorance of the appropriateness or the meaning of architectural forms. At the same time there is evidence of a certain local character asserting itself, which, however poor it may be, is interesting to study. These local characteristics consist of the use of pointed arch arcades supported on delicate marble columns imported from Italy for the purpose, with capitals of the classic "orders" pattern; the arrangement of the windows for lighting the immense halls and chambers which constitute these houses; and certain peculiarities in methods of construction due to the climate, and the rough soft sandstone of which they are built. But such characteristics, whether surviving from mediæval times under European influences or actually indigenous to the soil, seem hardly cultivated with any artistic perception; they are the mere accidents of local circumstances and methods of work. The constant introduction of the pointed arch in these houses

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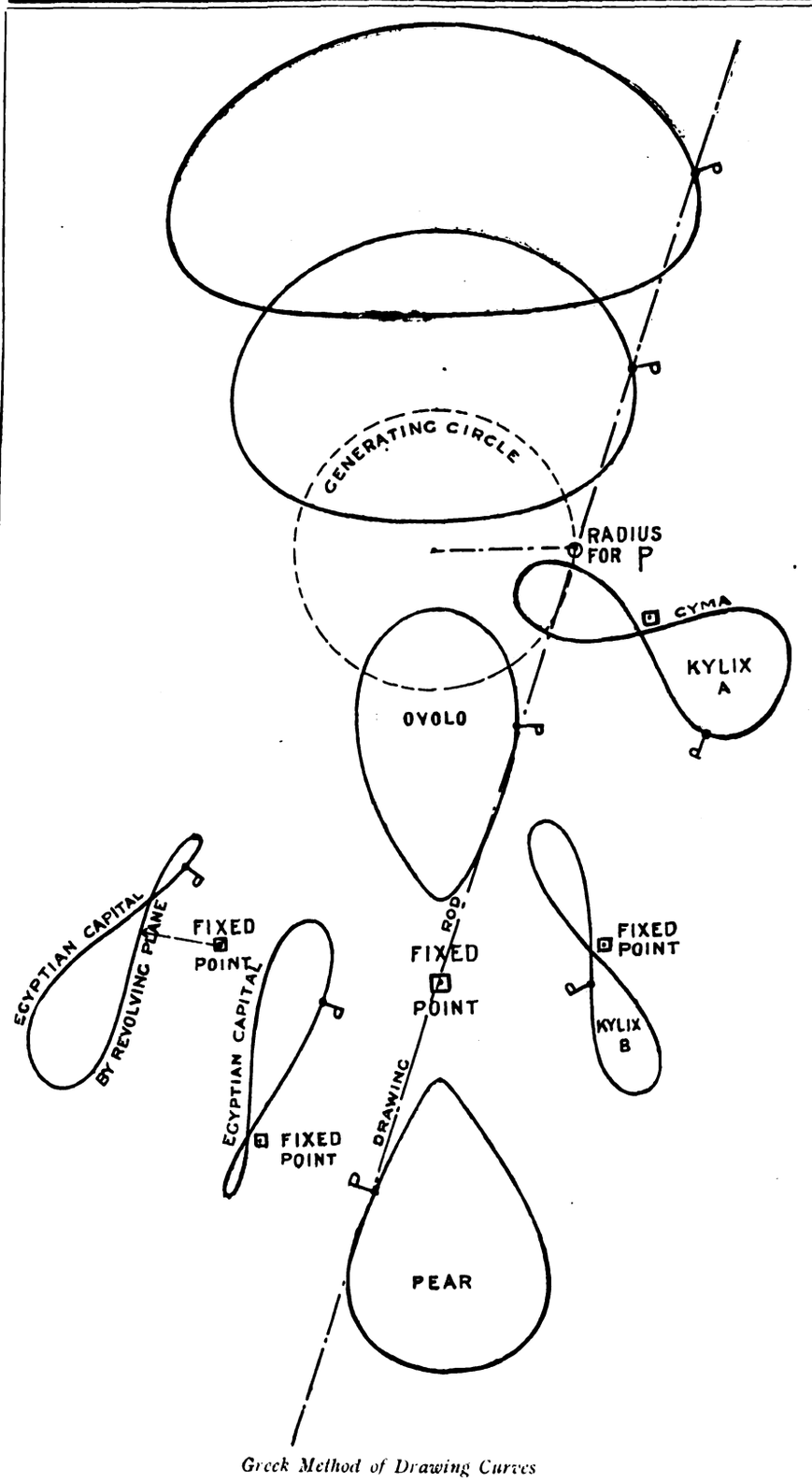


Greek Method of Drawing Curves

GREEK METHOD OF DRAWING CURVES.

By Mr. Daniel Wood.

In a letter in the *Builder* of January 18 I described and illustrated a method I had found of drawing the curve of the Ionic volute. The following remarks as to the possible methods employed by the Greeks in the delineation of curves in architectural detail and in the profiles of mouldings, are offered as a continuation of the same subject:—

One difficulty I had in drawing the volute was that unless the pencil was kept firm and steady during the whole of the revolution the line would waver. I tried many plans, but found the best way was to lengthen the string and fasten the end of it to a wooden rod drilled with holes, to rest this rod against the side of the cone, then to pull the string tight, put the pencil through the right hole, and draw the line, thus combining the stability of the rod with the elasticity of the string (see illustration).

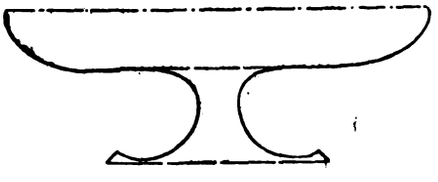
When I had drawn the volute, I wanted the lower line of the cushion of the capital which binds the volutes together, and tried to get it by loosening the rod from the cone and guiding it by a pin fixed in the drawing-board in such a way as to lead the drawing point in the required direction. I was experimenting with it when, to my astonishment, the pencil drew an ovolo, beautiful and perfect enough to satisfy even a Greek.

This was a fortunate find, but it took years to discover the various powers of this instrument. Its parts are simple enough—a string for the radius, a pin for a fixed point, a rod with holes for drawing the curves. Or, if you please, instead of the string, a circle drawn on the paper; and instead of the rod, a folded strip of paper. Mark on the paper the point of attachment to the circle, and the drawing point P between the centre of the circle and the fixed point, revolve the drawing rod round the circle, the edge always against the pin, and mark the course of P as you go; you will then have a Greek ovolo.

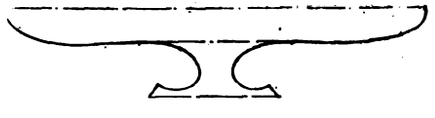
If P be beyond the circle, you will have scotias.

If P be beyond the fixed point, pear-shaped forms.

If P be at the fixed point, Kylix forms, of



KYLIX A



KYLIX B

which many are to be found in the vase rooms of the British Museum.

Cymas and other simple forms are easily found. If the line is not exactly what is wanted, the revolving plane may be substituted, and a fresh point taken on it a little distance from the first.

Remember, the diameter of the circle is

is the result of their mode of construction; the chambers are vaulted over with the rough stone and concrete pointed arch vaulting which is universal in the Levant, and as a consequence pointed arches over door and window openings seem to have been retained, partly through sympathy with the main constructional lines of the building, and partly through a certain convenience in constructing such arches on a large scale without proper centerings. This pointed arch style, however, is only retained for the most ordinary uses; wherever a purely decorative attempt is made the arches become semicircular, and the other details are imitated in a blundering fashion from European models.

In a future article we may give some description, with plans and diagrams, of ordinary Levantine modes of construction; these have hitherto attracted but little attention in Europe, and only a few French travellers, such as De Vogüe, have really touched the subject from an archæological point of view. The architecture of the Levant as a style, as far as it may be dignified by such a title, is of primitive antiquity; it is interesting to find such a "style" traceable in the buildings of the present day, in spite of Beyrout architects and engineers and the levelling influences of civilisation.

INSTITUTE, CAENBY, LINCOLNSHIRE.—The new institute at the village of Caenby, near Lincoln, has just been opened. The building is of red brick, with stone dressings and tiled roofs, in the old English half-timbered style, and the large hall will accommodate 250 persons. The architects were Messrs. W. Mortimer & Sons, Lincoln.

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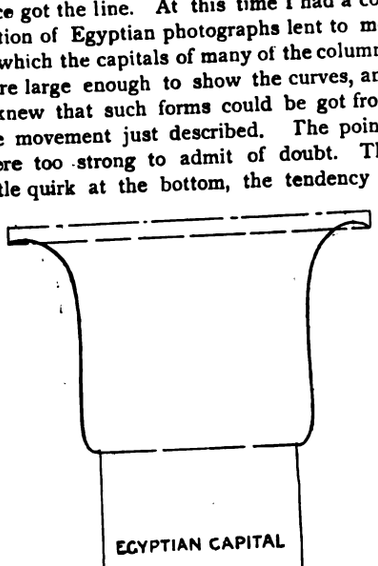
the diameter of the curve; thus you can easily get the size you want.

One point in my use of this instrument is of interest. I had to reproduce the Temple of the Winds capital, and tried to get the outline by using these instruments in their most complete form, but could not get it. I knew that such lines could be drawn by the simple movement I have described, but rather looked down on it; however, I just tried it, and at once got the line. At this time I had a collection of Egyptian photographs lent to me, in which the capitals of many of the columns were large enough to show the curves, and I knew that such forms could be got from the movement just described. The points were too strong to admit of doubt. The little quirk at the bottom, the tendency of



EGYPTIAN CAPITAL

the line to go behind the perpendicular, the great projection at the top, are just the characteristics of these curves.

It is hardly to be expected that in such days as these men will spend the time necessary to master Greek forms and methods, but this movement is so simple, and the curves it gives so useful, that one might hope for its adoption by both architects and designers in general, and if properly made metal instruments are obtained they are almost as easy to use as an ordinary bow pen.

I am happy in possessing a little old silver. The curves of the bowls and handles of the spoons are carefully drawn and appropriate. What a constant pleasure the use of them is! How different from having to look at the clumsy fiddle (dee-dee) patterns of the modern silversmith! One can only fancy what a spoon would be like with the bowl fashioned on an accurately drawn Greek ovolo, and the curve of the handle to match.

NOTES.

A Modern Cathedral.

MR. T. G. JACKSON has written a splendid letter on this subject in the *Guardian*—a letter which really sums up the whole truth of the question as to the style of a new cathedral. It is, of course, prompted by the discussion in regard to the Liverpool Cathedral, and we hope the Cathedral Committee will read, mark, learn, and inwardly digest it. In regard to the general question of style Mr. Jackson says:—

"All these questions about styles are misleading. Our object is not, or at least should not be, a new style. Our business is to recover and cultivate that artistic temper which will base itself on the conditions of the age and produce work that will satisfy and reflect them. If we do this our work will probably fall into some style more or less general, though it is hardly conceivable that in our complex society any style will ever become universal as in simpler ages. But, however that may be, the bringing in of a new style is no concern of ours. If it comes it will come of itself, as it always has done, and we shall awake to the fact that it has come without observation."

In regard to the special question of the Liverpool Cathedral he says (what we have also already said):—

"Surely it must be admitted that a cathedral to suit the twentieth century must be something very different from one of the twelfth or thirteenth. The long-drawn-out choir, where the conventual or collegiate body held their services, secluded from the nave, which served sometimes only for state, sometimes as the laymen's church, is no model for our congregational use. A cathedral like Canterbury really consists of two churches; the choir, seen from the nave, is only a dimly-lit recess at the end of it. In all our cathedrals, when large congregations assemble, the choir is forsaken for the nave, which is fitted up for the occasion in makeshift fashion. The inconvenience is obvious, but in our older cathedrals, built for a different service, it must be endured; to perpetuate it in a new one, which we can plan as we please, would be ridiculous. The preaching Friars of the Middle Ages, who aimed at attracting large congregations, felt the difficulty and met it by the large single-span naves of their churches, retaining the three-aisled plan only for a short eastern end. We, who have experience of the dome may improve on their plan, and bring still vaster areas within compass of a single voice. Let the Liverpool committee frankly accept the altered conditions of the age, and consent that their architecture should shape itself accordingly."

We would gladly have reprinted the whole letter, but that would not be fair to our contemporary; and the *Guardian* was the proper quarter for such a letter to appear, since it is the outsiders, and the clergy especially, who want instruction on the subject, rather than the architects.

Light Railways.

MODERN progress is producing a curious contest in regard to English roads. On the one hand, there is a distinct demand for light railways, a demand which must continuously increase. The general tendency of light railways, or, as they might properly be called, steam tramways, is to run along the high roads. On the other hand, the increase not only in bicycles, but in motors, an increase which is equally sure to become greater year by year, has produced a demand from both these classes of users of the high road for greater accommodation. It is obvious that the claims of these two parties are distinctly conflicting, because every inch that the light railway takes off a highway is so much off the convenience not only of the cyclist and of the ordinary driver, but also of the motorist. It was perfectly reasonable, therefore, that last week a deputation from the Roads Improvement Association should have an interview with the Board of Trade in regard to the proposed Light Railways Bill of the Government. The object of that deputation was to give legislative power to Light Railway Companies to take land by the side of highways for the purpose of building a new road on which a light railway could be laid, and also to make further roadways suitable for other classes of traffic, as well as to give them the power to tunnel where necessary under the roadway. In a word, the object of the deputation was to oblige, indirectly perhaps, light railways to be made along the sides of highways and not on the roads themselves, so as to enable the existing roads to be used for motor and other traffic. It seems to be clear that either this course will have to be taken, or else roads will have to be very largely increased in breadth where light railways are run along them if the traffic of the future is to be safely managed. There can be little doubt that we are arriving at a time when legislation in regard to high roads will become absolutely necessary if proper accommodation for the increasing traffic, especially near large towns, is to be found; but one may perhaps doubt whether time will be found for some sessions for this purpose.

Guard Wires on Electric Tramways.

THE Board of Trade propose to alter one of their rules as to guard-wires on electric tramways, and have been circulating copies of the amended rule, with an "explanatory memorandum," amongst experts interested in the matter. The new regulation is certainly an improvement on the old. The use of guard-wires under insulated telegraph or telephone wires will no longer be compulsory. On the other hand, if a bare telegraph wire can by any possibility be blown on to the trolley wire, then efficient guard-wires must be used. Certain members of the Tramways and Light Railways Association have taken exception to the amended rule. They want the clause about the overhead wires being "blown on to" the trolley-wire to be omitted, and they want a clause added to the effect that when the crossing wires are erected after the tramway conductors, then the cost of the guard-wires shall be recoverable from the owners as a civil debt. In the "explanatory memorandum" various useful hints are given as to methods of fixing the guard-wires, and clear diagrams are drawn to show how they should be arranged in various cases. We think, however, that it has not been satisfactorily proved that the increased safety from accidents by electric shock from broken telegraph wires given by this multiplicity of guard wires is not counterbalanced by the increased danger from the guard-wires themselves breaking. Earth connexions are not always operative at critical moments, and galvanised steel guard-wires are always liable to corrosion. We believe that traction engineers strongly object to using guard-wires, as it very greatly increases the risk of a breakdown on their system. There is no use in making the overhead work of an electric tramway more unsightly than it is at present, for a problematical good. The guard-wire should be used as sparingly as possible. Insulated telegraph wires or telephone cables, when not too heavy, we believe to be safe; but, of course, it is always best to bury them.

The Acetylene Association.

A BRITISH Acetylene Association has recently been formed for the advancement of acetylene engineering and manufacture. The work of the Association will be very similar to that of other technical societies, and will include the discussion and publication of original papers, and co-operation with Government and Local Authorities, insurance corporations, and shipping and railway companies, with a view to safeguarding and facilitating the transport and use of calcium carbide. The principal officers of the new Association, who have been elected by ballot, are Mr. F. G. Worth (chairman), Sir Charles Forbes, and Mr. F. W. Harker.

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(Vice-Chairmen); Mr. Charles Bingham (Treasurer), and Mr. J. R. Fawkner (Representative of the Official Organ). The Association is to consist of an unlimited number of ordinary members, and a certain number of honorary members and corresponding members. Having regard to the internal dissensions for which the acetylene industry has in past years been notorious, the formation of the new Association is a welcome indication that more rational methods of advancing the industry are to be adopted. Under the able chairmanship of Mr. Worth, who has been the principal pioneer of the industry in this country, and with the support of the other members of the Council, who are all well-known acetylene advocates, the Association should accomplish much good work. To quote from a leaflet issued by the Association:—"Too much must not be expected at first, but by working together and sinking, as members of the Association, all trade and personal differences, much may be accomplished for the general benefit." The Association at present consists mainly of manufacturers of acetylene appliances, but we understand that any one interested in acetylene is eligible for membership. The secretary (*pro tem.*) is Mr. Lacey Downes, 11, Ironmonger-lane, London, E.C.

Bunhill-row and Commemorative Tablets.

WE learn that the Society of Arts have just caused a tablet in memory of Milton to be erected against the front of a factory which stands upon the site of the poet's last home in London. Shortly before the outbreak of the Great Plague, Milton had removed from Jewin-street, Aldersgate, to what was at that time Artillery-walk, Bunhill-fields. Dr. Wright, the Dorsetshire clergyman, gave Richardson an account of his visit to the poet, whom he found living in a small house, blind and suffering from gout, seated in a little room, on the first floor, "hung with a rusty green." Milton lived longer in that house than he did in any other. He there composed his two epic poems and "Samson Agonistes," and, as Dr. Johnson says:—

"Being driven from all public stations, he is yet too great not to be traced by curiosity to his retirement, where he has been found by Mr. Richardson, the fondest of his admirers, sitting before his door in a grey coat of coarse cloth, in warm sultry weather, to enjoy the fresh air, and so, as in his own room, receiving the visits of people of distinguished parts as well as quality."

In his memoirs of Milton, Professor Masson relates that he ascertained with some trouble the position of the house in the present Bunhill-row, on the left-hand side of one turning northwards out of Chiswell-street. The white terra-cotta tablet bears a suitable inscription, which we gladly observe directs the wayfarer's attention to the "site of the house." In at least one instance which we recall, a tablet inscribed "lived here" was affixed by the Society of Arts on the front of a building in London that was erected since the death of the celebrity commemorated, so as to mislead people who take interest in those matters. We trust that the London County Council, who, it seems, have undertaken the task in future, will exercise all due care in carrying out their scheme in that behalf.

The Fine Art Society.

MR. GEORGE S. ELGOOD has another exhibition of his water-colour drawings of "Gardens" at the Fine Art Society's Gallery, Bond-street. As dainty and as painstaking as ever, they exhibit the greatest skill in handling, particularly in the great yew-tree subjects that are so largely represented in the collection. Perhaps the best drawing in the collection is that of "The Manor House, Cleeve Prior." Another distinctive feature of this artist's work is the accuracy with which he represents garden flowers. "A Corner of the Rose Garden, Ramscliffe," would satisfy the most captious florist, so photographic is the copy from Nature. We do not think Mr. Elgood has been so successful with his drawings of Italian gardens; there is the same accuracy as to detail, but the glamour of the southern sky has not been realised. The best of the Continental studies is that entitled "Among the Olives, St. Barthelemy, Nice," which is a dainty little drawing. Of the several views of characteristic Italian gardens, "Belvedere Villa, Cicogna," is the best, a very charming subject. The limit of excellence to these drawings seems to us to be self-imposed by the artist's methods. Whether the subject be an Italian or an English garden the treatment is identical; very occasionally there is the real feeling of sunlight and an attempt to obtain broader effects; and one comes away with the impression of having seen too much of the same kind of thing.

The Royal Academy.

ALL architects will hear with satisfaction that Mr. G. F. Bodley, so many years an eminent Associate of the Royal Academy, has been promoted to the full dignity of "R.A." The election was a just tribute to the uniformly beautiful and refined character of his architectural works. On the same occasion Mr. M. Ridley Corbett, a landscape painter of great individuality of style, was elected an Associate.

LETTER FROM PARIS.

THE State and the City of Paris are agreed at last upon the final plans for the transformation of the Champ de Mars. The State grants to the City the right to demolish the Galerie des Machines, and to set apart for building purposes the ground bordering the Avenue de Suffren and the Avenue de la Bourdonnais for a depth of 50 mètres. It is agreed that the central portion of the ground shall be left free of any buildings, and shall be arranged as a park with a lake in the centre. It will be some time, however, before the work can be commenced, for the Machine Gallery has been let for several months to come, and the buildings still existing on the Champ de Mars will scarcely be demolished before the end of the present year.

The Commission des Monuments Historiques has lately visited the Château of Versailles for the purpose of examining the work of restoration undertaken in 1901, and to decide what further work shall be put in hand this year. The restoration of the central façade on the gardens is now completed, and the work on the façade towards the Orangerie will be commenced. The restoration of the exterior of the Petit Trianon is also completed, but there is still a quantity of work to be done in the interior. The work on the Grand Trianon is far advanced, and the sculptors are now about to re-establish, after the painting by Martin, the splendid vases upheld by figures of children which used to surmount the balustrading. The horse-shoe staircase before the Grand Trianon will now be available to the public on holidays. The restoration of the large rooms of the Orangerie is being also actively undertaken. All this work is being done under the direction of M. Marcel Lambert, Architect to the Palais de Versailles, and, thanks to the efforts of the Prefect of the Seine and Oise Département, measures are being taken to provide the château with suitable fire-engines and the necessary water service, with which the buildings have for so long been quite unprovided.

A curious discovery has been made during the work of repaving the interior and exterior courtyards of the Louvre, and it seems singular that the discovery was not made before by one of the thousands of people who are continually crossing the paved portion. It has been found that the paving stones of the pavement on the river side of the building, paving which was probably put down by Lefuel, are arranged in such a manner as to form two large letters H taking up the whole width of the pavement in front of the pavillon Lesdiguières, and two letters N in front of the Pavillon Tremoille. These initials of the two Sovereigns under whom the Louvre Palace was so largely increased will be carefully left in their present places.

One of the oldest and most interesting of Parisian churches, that of St. Nicolas des Champs, will, owing to the setting back of the Rue Turbigo, shortly be entirely freed from the old and unsightly houses now surrounding it. An appropriate railing will be placed around the church.

The appeal by the sixty owners of houses at Paris against the decision made some time ago condemning each owner to pay damages to the amount of one franc, and the immediate execution of the work of the *tout à l'égout*, which they had refused to instal in their houses, has resulted in a judgment in favour of the defendants, for the reason that the Préfet de Police was not in a position to legally take measures against the delinquents. The triumph of the householders is, however, only a temporary one, for the City Authorities will now follow up the matter in the manner required by the law. There are over 60,000 householders at present who have not yet complied with the requirements of the recent law concerning the installation of the *tout à l'égout* system at Paris.

A formidable plan of "Haussmannisation," which will cost about 12,000,000*l.*, is being urgently considered. This scheme will comprise, among other work, the completion of the Avenue Ledru-Rollin, the continuation of the Boulevard Raspail, the prolongation of the Rues Etienne Marcel and Echiquier, the widening of the Rues des Prêtres, Boetie, and Courcelles, and the construction of a new bridge between the Pont Neuf and Pont des Arts, to be called the Pont de la Monnaie. The disengaging of the Carnavalet Museum, the enlarging of the Halles Centrales, the completion of the Palais de Justice, and the transfer of the St. Lazare Prison are also a part of the scheme.

The late M. Jean Eugène Rouyer, architect, has left by will to the Académie des Beaux-Arts an annual sum of 40*l.* for a special prize to be awarded in the Section of Architecture.

The jury for the Concours de Façades of houses built at Paris in 1900 has awarded the premiums to the following six houses and their architects:—No. 1, Rue Danton, architects MM. Arnaud and Peronne; No. 21, Rue Monsieur, architect M. Goy; No. 85, Faubourg Saint-Martin, architect M. Hermant; No. 170, Rue de la Convention, architect M. Legriel; and No. 81, Avenue Malakoff, architect M. Le Voisvenel.

A scheme for enlarging the new Opéra Comique will probably be adopted shortly. It is proposed to purchase the buildings placed behind the theatre and facing the boulevard, and to construct in their place a continuation of the theatre building, with a façade on the boulevard, destined to increase the importance of the stage and its dependencies. The proposed work will cost 100,000*l.*

The Société Nationale des Architectes has elected its officers for 1902 as follows:—President, M. Fernoux; vice-president, M. Bouhon; secretary, M. Christie; and treasurer, M. Charpentier.

Some of the recent protests made by the "Vieux Paris" Committee have provoked quite an amusing and interesting controversy between the members of the above committee and a newly-formed society of young architects entitled the "Société du Nouveau Paris." These latter maintain that the "Vieux Paris" members exaggerate the importance of the old and often ugly and menacing gable ends, and buildings which are covered by their protection; the "Nouveau Paris" men desire, on the contrary, to develop a new aspect for the future Paris, and to encourage as much as possible an individual research after a modern style. The chief members of this new society are architects well known to the public by their street work;

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amongst these are MM. Hector Guimard, the author of the Castel Berenger; Paul Binet, architect of the Porte Monumentale at the late exhibition, and others, all known as the "jeunes" or younger members of the profession at Paris, and all fervent advocates of an "Art Nouveau."

A committee of philanthropists has been formed with a view of founding an institution for male and female students whose resources do not permit them to continue their studies in the work they have set out for themselves. This institution will be constructed in one of the best quarters in Paris; its exterior aspect will be monumental and luxurious; the interior will be arranged in a comfortable manner, without luxury, and every attention paid to sanitation. The building will be arranged for 200 boarders. A competition will shortly be opened.

The Prefect of the Seine is authorised by the Municipal Council to enter into the following terms with the State concerning the demolition and occupation of the existing fortifications around Paris. The State will agree only to cede the various cites cleared by the demolition of the fortifications in accordance with the street plan prepared by the City; the State will cede gratuitously to the City all the ground necessary for the execution of this plan. The City will execute the plan only in accordance with the requirements of the building ground as occupied. The State will advance the funds necessary for the work; the City will repay this advance by annuities, and besides, will have the right to recover the road-making expenses from the future owners of the vacant ground.

The plan of the ancient chapel of the Sorbonne, long demolished, is at present being perpetuated in the large courtyard of the Sorbonne by means of paving stones of a different colour to the rest of the paving, similar to the work which was done in the courtyard of the Louvre and on the Place de la Bastille.

M. Le Deschault, architect to the Panthéon, has resigned his post to M. Nénot, the well-known architect of the New Sorbonne. It will therefore fall to the lot of M. Nénot to achieve the important temporary decorative and heating work in the interior of the Panthéon for the centenary fêtes of Victor Hugo.

At the commencement of the present year, the Municipal Council were occupied with a practical question of much public interest, and which, coming up on the eve of the elections, assumed almost a political importance. This was the price of gas, fixed at present at 30 centimes the cubic metre, an abatement of which has been long demanded. The Nationalist majority of the Council voted a reduction of 10 centimes, a popular proposal, which, however, will probably not be ratified by the higher powers, being regarded as an electoral manœuvre.

Yet more metropolitan lines are proposed, in addition to those already established or in progress. The most important, completing the circle on the south side, will run from the Place du Trocadero to the Gare de Lyon, crossing the Seine twice at Passy and at the Gare d'Orleans. It will have eighteen stations, and will serve the quarters of Passy, Auteuil, Vaugirard and the École Militaire, Montparnasse, Montrouge, the Gobelins, and l'Hôpital. On this last point there is a conflict between the municipal engineer and the "Vieux Paris" Committee, which has vehemently protested against the construction of a viaduct alongside of the Salpetriere, which would spoil the view of the fine façade of this former arsenal of Louis XIII., as well as that of a church built in 1670. The result will probably be some modification of the scheme.

The prolongation of the Rue de Rennes would involve the construction of an inclined bridge across the Seine, abutting on the extremity of the Ile de la Cité. The idea of a bridge here dates from the time of Baron Haussmann, but the proposal has raised an outcry from the "Vieux Paris" Committee, so far reinforced by the Press that the Municipal Council has felt bound to take account of it. This is one of the most picturesque and historically interesting points in Paris, and the proposed new iron bridge would shut out the view of the fine old bridge of Androuet du Cerceau, with the spires and gables of the old quarter rising above it. The objectors to the scheme are not unreasonable, for a glance at the plan of Paris will show that the prolongation of the Rue de Rennes could, with a very slight deviation, be led up to the Pont Neuf, which would afford accommodation enough for the traffic, and that there is really no necessity to spoil, for the sake of a new bridge, a piece of city scenery which is the work of many centuries.

The proposed prolongation of the Rue de Rennes also threatens the partial demolishing of the ancient Palais Mazarin, situated behind the Institut. The "Vieux Paris" Committee is taking the matter in hand for the protection of the building.

The danger to the valuable collections in the Louvre from the proximity of the Government offices which occupy the Pavillon de Flore is still a matter of public talk and of comment in the Press; the managers of the Fire-brigade Department have issued a short but very strongly-worded report on the subject, but the Government find it convenient to turn a deaf ear to these representations. The only possible solution of the question is to give up the whole of the Louvre to the Museum, from the Pavillon de Flore to the Rue de Rivoli, so that the whole building may be under one management.

Nine decorative paintings by M. Poilpot have just been placed in the galleries of the Sorbonne connecting the Salle des Pas Perdus with the Cour d'Honneur. In one of these galleries are five paintings representing the Court of Lions at the Alhambra, the Church of St. Sophia, the Roman Forum, the Temple of Philæ, and the Parthenon. In the other gallery are four pictures representing the City of Carcassonne, Nôtre Dame at Paris, the Château of Chenonceaux, and the Place des Vosges.

In regard to the Salons this year, the Salon Nationale (New Salon) will open on April 20, and there is to be an innovation in the shape of an entirely open-air sculpture exhibition, in the small square between the Grand Palais and the Palais de Glace. This will consist of works of sculpture intended for open-air sites in public places, so that they can be seen at the exhibition under the light they are ultimately intended for. The "Old Salon" will adhere to its usual opening day, May 1. Along with it will be opened, on the ground floor of the Grand Palais, an interesting exhibition of objects found during explorations in Persia and Chaldæa, arranged by M. de Morgan and his collaborator Father Scheil, a Dominican who is a professor at the Ecole des Hautes Etudes.

During ten days artists and other privileged persons have been invited to the atelier of M. J. Paul Laurens to see his large painting to be reproduced in Gobelins tapestry as a decoration for the Mairie of the XIIIth Arrondissement. M. Laurens has a distinctly individual style in his treatment of decorative subjects, and this new work illustrates his power in composition and a care for correctness and finish in detail which may perhaps be carried a little too far for the best and broadest general effect. In the foreground a group of men and women in seventeenth-century costume throng around the bronze statue of Colbert, saluting the effigy and bringing offerings of flowers. In the distance is a long procession of admirers, and of Gobelins artisans, in the midst of a landscape through which flows a river. The upper part of the picture is occupied by floating symbolical figures. To right and left of the composition powerfully-drawn nude figures support escutcheons ornamented with inscriptions. The whole is surrounded by a rich border of decorative foliage, cornucopias and garlands. The general scheme of colour is treated with special regard to the quality of tapestry work.

The death is announced of the Comte de Calonne, for many years well known as an art critic in various journals. M. de Calonne, who was eighty-four at the time of his death, was one of the first founders of the *Revue Contemporaire*, of which he was editor till 1870, and he was librarian of the "Société des Agriculteurs" of France. During the Franco-German war he was correspondent of the *Times* at Paris.

We have also to record the death of the eminent sculptor Adrien Gaudez, author, among other things, of the statue of "Lulli Enfant," of which we published an illustration in our issue of April 26, 1890. He was an artist of high talent, and had obtained many official "récompenses." Most of his principal works ("Echo," "Le Ciseleur," "Le Moissonneur," &c.) were purchased either by the Government or by the Municipality. He executed a statue of Perronet for the town of Neuilly-sur-Seine, the monument erected at Alais to the memory of Florian, and that at Remiremont to the memory of the soldiers of the Vosges who fell in defence of their country. During the war Gaudez was a prisoner at Magdebourg, and there carved in granite a mausoleum to the memory of French soldiers who had died in captivity, which still stands in the cemetery of that city.

The "Conseil d'Architecture" of the Municipality will shortly have to award, in conjunction with the Fine Arts Committee, the Lheureux prize. This is a prize which was founded by the widow of Lheureux, the architect, to be awarded in alternate years to a sculptor and an architect. The Fine Arts Committee last year awarded it to M. Dalou, for his great group of the Republic. The choice of an architect may be more difficult, but if it is to be awarded with reference to recent buildings, there can hardly be a doubt that the prize should go to the architect of the Petit Palais.

A DAY'S WALK IN MID-KENT.

STARTING from Week-street, Maidstone, along the high road to Rochester, and leaving the barracks upon the left, one emerges on to the plateau that slopes to the Medway. On the right hand stands Park House upon land that at one time appertained to Boxley Abbey; then from the rising ground between Lower Quarry and Middle Quarry Woods a crooked descent brings one to the Running Horse at Sandling, where a road turns to Aylesford. Before that road is followed it is quite worth while to step aside into the field upon the left hand for the sake of the prospect of the beautifully wooded valley through which the river winds and of the partially hidden ruins of Allington Castle in the foreground, upon the river's remoter bank. The castle, wherein Anne Boleyn passed her childhood, belonged (*temp.* Richard III) to Sir Henry Wyatt, one of Henry VII.'s executors. It was the birthplace (1503) of his son, the courtier and poet, and of his grandson, who on January 24, 1554, sallied forth from Allington upon his bootless enterprise to collect his followers at, it is believed, the neighbouring Penenden Heath, the general trysting-place of rebellion. On the heath, now laid out as a recreation-ground, Wat Tyler and Jack Cade gathered their men. Upon Sir Thomas Wyatt's attainder for high treason the property went to the Crown. Queen Elizabeth bestowed it upon John Astley, Master of the Royal Jewels. In 1753 it was acquired by Lord Romney, to whose descendants belonged, until two or three years ago, The Mote, distant one mile eastwards from Maidstone. The general plan of the buildings and the moat can be fairly made out. The ruins include the entrance gateway and the porch of the great hall in the north court. Over the site of the buttery and offices is built a house which embodies parts of the original walls and of the old materials. In the south court's south-west corner are the remains of a tower containing the corbels of a fireplace. Whilst there is little to detain the student of military architecture, a detailed planning of the apartments would prove to be a difficult task. The parish church of St. Lawrence, recently restored, is for the greater part of Early English time, with an older tower. Here is a tumulus, and near the Quarry were found in 1844 the site of a Roman cemetery and the foundations of some coeval buildings.

Resuming our walk* for about two miles, and passing on the right Cobtree—which some identify with the Dingley Dell of "The Pickwick Papers"—and a pumping station of the Maidstone Waterworks, we reach Aylesford, the British Saissenaighobail, and scene of the great battle between Vortigern and Hengist and Horsa, fought A.D. 455, when, according to the Anglo-Saxon Chronicle:—

> This year Hengist and Horsa fought against Vortigern at the place which is called Ægels-threp: and his brother Horsa was there slain, and after that Hengist obtained the kingdom and Æsc his son.

Bede records that in his time Horsa's monument, bearing his name, was standing "in the east part of Kent," and a heap of flint stones at Horstead, some three miles northwards, is still pointed out as the grave of the Jutish leader. At Aylesford, in 1016, Edmund

* The route may be shortened by continuing along the Roman road northwards to Aylyard and Warren, gaining the Pilgrims' Way at the end of Boarley Warren, and so to Boxley (*vide* text).

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Ironside routed the Danes whom he had pursued from Otford. At Friars, close to the town, are remains comprising an ancient chapel, and the foundations of the refectory of the first friary of Carmelites that was established in England, having been founded in 1240 by Richard de Grey and Ralph Frisburn; Henry VIII. gave it to Sir Thomas Wyatt the elder, and after his son's attainder Elizabeth granted the house and lands to John Sedley, of Southfleet, from whom they were inherited by his brother, Sir William, and there was born Charles Sedley, the poet. The Sedleys converted the friary into a dwelling-house, in which they incorporated the cloisters; a shield, with date and initials "1590 I. S.," is on a door beneath the entrance lodge's archway. In his diary, March 24, 1669, Pepys mentions Sir John Banks as living there—he had acquired the property from Sir Peter Rycant—and it appears that Sir John Banks remodelled the house and inserted new ceilings and panelling throughout. The parish church of Sts. Peter and Paul, at the bridge's north end, forms a pleasing feature of the view from the river's left bank. Restored in 1878 and (the tower) in 1885, it contains some early twelfth century work and the tomb of Sir Thomas Colepeper, of Preston Hall, now the seat of the Brassey family. Sir John Banks's daughter and co-heir brought the property in marriage to Heneage Finch, Solicitor-General, 1678-86, elevated Earl of Aylesford, October 19, 1714. Of the fourteenth-century bridge the two middle arches have been made into one, and we understand that it is proposed to rebuild the bridge, as obstructing the subsidence of river floods. Standing upon the bridge, we are upon the Pilgrims' Way, which, entering the county near Titsey in Surrey, near Westerham, may be followed to Chevening, where it formerly traversed the Park, thence across the river Darent at Otford, and so along the side of the southern slope of the North Downs to Aylesford and Charing. That ancient road is of pre-Roman origin; the now generally accepted belief that it formed the main line for tin traffic from the West of England to the Kentish Rutupiæ, or Sandwich haven, is strengthened by the fact that ingots of tin have been dug up along its course, having been hastily buried, it is supposed, by the convoys when threatened by robbers. Its narrow track, now grass-grown in places, and distinguished by the yew trees planted along it, as well as by several British earthworks and remains of the Roman occupation in the immediate vicinity, is now but little used, but as lately as the middle of the sixteenth century it was known as the King's highway from Westerham to Shoreham (in Kent). Lying along the outskirts of the Forest of Anderida, and following the range of chalk hills that extend through the north parts of Hampshire, Surrey, and Kent, it formed the route for pilgrims from Southampton sea-port and the West and South-West of England to the martyr's shrine at Canterbury, and pursues its way about half-way up the hillsides, presumably for protection from the weather.

From Aylesford we follow the Pilgrims' Way northwards through Cosenton to the road that leads to Burham, towards Blue Bell Hill, on which will be seen some ancient military earthworks. Scattered around are the denuded sarsen stones, locally known as "the countless stones"—so named after a tradition that obtains also at Stonehenge; and in the upper field on the left hand, beyond the Lower Bell inn, the cromlech of Kit's Coity House (tomb in the wood), the reputed burial-place of Vortigern's son Catigern, who fell at Aylesford; which Mr. Henry Brassey, of Preston Hall, lately placed under protection of the Crown. Here we gain the southern escarpment of the chalk hills which form the North Downs, and round about we see remains of the tertiary beds in the shape of some denuded masses of sandstone, including those just cited. The North Downs belong to the chalk strata of the Chiltern Hills, which, dipping beneath the London clay, reappear between Shoreham and Eynsford, and traverse the county to Hythe. To the south extends, from Hythe towards Sevenoaks, the range of hills of the Lower Greensand, from which is quarried the limestone or Kentish rag that lies between sandy beds of hassock. The two ridges overlook the valley (watered by the Len) in which we are walking, the bottom consisting of the gault, a stiff blue clay, highly fossiliferous, wherein the elm trees flourish, and of which a notable section may be seen at Aylesford, where also is a sand-pit whose upper stratum is composed of the Medway gravel mixed with flints, fossils from the gault, and fragments of water-worn rag and iron stone, above a stratum of white sand, being the upper stratum of the Sandgate and Folkestone bed of the Lower Greensand, as is visible in the sand-pits at Crismill farm, near Bearsted, Penenden Heath, Sandling, and Hollingbourne, and other places in their vicinity.

From the cross-roads at Boxley we make a detour of about a mile into the fertile plain to visit the church and the once famous Cistercian Abbey of St. Mary and the Holy Rood of Grace, founded in 1146 by William de Ypres, Earl of Kent, for a band of monks from Clairvaux, and endowed by Richard I. with the manor of Boxley. The ruined walls encompass a polygonal area of about fourteen acres; the brick-faced piers of an outer stone gateway on the west side yet remain; an inner gateway is described in a MS. account by Hasted (1774). In the south-west corner stands the granary; to the north-east of that is the house built by Sir Thomas Wyatt, where recent excavations seem to show that the retaining wall of the terrace is a part of the abbey's south aisle wall. The abbey and lands, valued at 219*l.* per annum, were granted at the Suppression to Sir Thomas Wyatt the elder. Lambarde (1570) describes the miraculous figures of the Holy Rood and St. Rumbald, with which the monks imposed upon the credulous. At Farthings, where Henry III. granted to the monks a weekly market for the fruits of their tillage, on the road just outside the west wall, around the enclosure, is St. Andrew's Chapel, now a cottage, which contains portions of its windows and doors, including the priest's door near the east end of the original south wall, and a three-light window in a new south wall. When on his way, 1321, to Leeds Castle to punish William Colepeper, the castellan, for denying admittance to Queen Isabella, Edward II. halted at Boxley, and during his sojourn there granted to the City of London a charter of freedom of choice in the election of Mayor; and there Archbishop Warham met Cardinal Campeggio (1518) on the latter's journey to London in the matter of the King's divorce. At the time of taking the Domesday Survey Boxley (Boscleu) was one of the 184 manors in Kent, besides 250 elsewhere, held by Odo, Bishop of Bayeux, and on the adjacent Penenden Heath was held the three days' trial of Odo, on charges of rapacity and injustice brought against him by Lanfranc, as is recorded by Ernulph, the Canterbury monk, afterwards (1114) Bishop of Rochester. The early thirteenth-century parish church of All Saints has a later battlemented tower with turret, not infrequent in these parts. It is remarkable for its western porch, by some called a galilee, which has since been extended southwards; it is claimed for a mortuary chapel by the owners of Vinters, near Maidstone, and is said to have been built by Roger de Vinter in the middle of the fourteenth century. The corbel ends of the mouldings over the west door have carved heads of Bishop Hamo de Heath, of Rochester, and, it is supposed, Edward II. The latter bears a crown of four large and four small strawberry leaves, as on that King's effigy at Gloucester. The church contains memorials of the Wyatt family, and a brass of Richard Tomyow in plate-armour, who died June 12, 1576. (See also the late Rev. J. Cave-Browne's history of the parish.)

Returning to the Pilgrims' Way, we proceed south-eastwards to Detling, where the highest point, at a short distance along the road to Sittingbourne, is 655 ft. above sea-level, and on to Thornham, where, at the cross-roads by the Black Horse inn, is a tumulus. The by-road on the left hand leads to Thornham, or Godard's Castle, now in ruins, where Roman sepulchral urns and other remains have been discovered. In Thornham was found the valuable stratum of white Maidstone sand which, worked by Italian craftsmen, advanced the glass industry in this country. The parish church comprises the "Cutte" chapel. Queen Mary gave the Vinters estate in Boxley parish to Dr. John Cutte. The old Wevering manor-house is now a farm, acquired by the Vintners' Company from Stephen Mason, of Bearstead, in or about 1560. Passing the quarries on the left side of the Pilgrims' Way, with Gore and Longham Woods in the valley below on the right, we continue through Broad Street and Little Allington to Hollingbourne, where we turn to the north-east to ascend the hill to White Post, just beyond Hollingbourne House, to enjoy the view at an altitude of 630 ft. The Elizabethan manor-house of the Colepepers, built of small red bricks, with stone dressings, and now deprived of its northern wing, stands, it is said, upon the site of the court-house which Athelstan bought from his father and gave to Christ Church, Canterbury, and embodies a structure of an earlier date. Of All Saints' Church (restored by Sir Gilbert G. Scott) the nave, chancel, north aisle, and tower are apparently the original fabric; a window on the chancel's north side and the east window have some elegant Decorated tracery; the nave arcade of pointed arches is carried by octagonal pillars. A fifteenth-century chauntry chapel at the end of the north aisle was converted into a monumental chapel for the Colepeper family; the floor has been raised and the walls are faced with flint work. There are the monument of Francis Colepeper, of Greenway Court, *obiit* 1597, and altar tomb of Elizabeth, wife of Sir Thomas Colepeper, *obiit* 1638. The villages of Hollingbourne, Thornham, and Boxley are named, it is said, from the holly, thorn, and box trees in their respective neighbourhoods.

Crossing a field beyond the churchyard, we enter the by-road to the hamlet of Eyhorne-street, which gives a name to the hundred, noticing on the left hand the fine old half-timbered Godfrey House, built in 1587 and reinstated in 1859. We gain the high road from Ashford to Maidstone at a point nearly opposite a park gate of Leeds Castle,* and, turning westwards, follow the main road past the Magpie Bank Caves, some supposed deneholes discovered two years ago, Hollingbourne Union Workhouse (1836) at Whiteheath, Crismill Farm, and Bearsted Parish Church, conspicuous for its lofty tower. And so, descending the hill between the boundary-walls of The Mote, formerly the seat of the Earls of Romney and since belonging to Sir Marcus Samuel, and Vinters, at the foot of which are Hollingworth's, once Whatman's, Turkey paper-mills, we arrive at Maidstone again.

BERMONDSEY ELECTRICITY WORKS.

ON Thursday of last week the new municipal electric lighting and dust destructor works at Bermondsey were formally opened. The destructor consists of six cells, which are able to consume 50 tons of domestic and trade refuse every day. The heat from the burning refuse passes through flues to the water-tube boilers, forced draught being used in the furnaces. The boilers, however, can be fired by coal if necessary. The engines used are Willans' high-speed engines directly coupled to multipolar dynamos, which generate current at 480 volts. The power is distributed by a three-wire direct-current system, with the maximum permissible voltage (480) between the outers. The mains are triple concentric mains, so that we do not anticipate that any trouble will be experienced in regulating the voltage of the positive outer to earth, or that there will be any appreciable earth currents over the area of the supply. The charge to consumers is 6d. for the first hour of their daily average demand, and 3d. per hour afterwards. For motors a charge of only 2½d. per unit will be made.

In our opinion, the charge for motive power is very cheap, and it ought to be a boon to manufacturers in the district. For lighting at 240 volts the charge is excessive. We have not yet tested a 240-volt lamp which has anything like the efficiency of the ordinary 100-volt lamp. We think, judging from careful tests that we have made, that the average efficiency of the 240-volt lamp is only about half that of the 100-volt lamp. Hence, to compare the Bermondsey supply with a 100-volt service we must double the prices charged. Another point that consumers in this district will have to consider is that their switches will have to be specially constructed, and that they will be only able to control a small number of lamps. In order to popularise the light we understand that the Council propose to introduce a system of free wiring and "slot" meters. They are also going to have an electrical exhibition in the Town Hall at the end of next month. We would suggest that they exhibit tests made by independent authorities on the relative merits of 100-volt and 240-volt lamps. Such tests would be of great interest to consumers, and

* For plan and description see *Builder*, August 3, 1889.

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we would welcome data which we could compare with the results of our own experiments. Slot meters also are extremely inaccurate.

The general arrangements of the electrical station, which are due to Messrs. Kincaid, Waller, & Manville, are excellent. We noticed that separate wattmeters were inserted in the charge and discharge circuits of the cells, instead of having a combined instrument for both. We think this a great improvement. It is proposed to utilise the clinker from the destructor plant in making flagstones. It is ground in a mill, and a paste is made by mixing it with water; it is then by hydraulic pressure made into a stone of the size required. The grinder, mixer, and hydraulic pump are all driven by a 25-h.p. electrical motor.

THE ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.

THE seventh meeting of the Discussion Section of the Architectural Association for this session was held at 56, Great Marlborough-street, W., on Friday, the 24th inst., when Mr. F. G. W. Buss read a paper entitled "The Clerk of Works: His Duties and Responsibilities." Mr. George H. Smith, the Vice-Chairman of the Section, presided.

The Chairman, in opening the proceedings, said his first duty was to welcome, in the name of the Discussion Section, Mr. Walker and his fellow members of the Clerk of Works' Association, who had so kindly come down to the meeting in order to give them the benefit of their experiences.

Mr. F. G. W. Buss then read his paper on "The Duties and Responsibilities of a Clerk of Works." He remarked at the outset that he had purposely prepared a short paper because he thought the chief object of the meetings of this section was the discussion that takes place after the paper is read, and not the paper itself. He proceeded by quoting Mr. Hudson's definition of a clerk of works, and went on to deal with the duties and responsibilities in a concise and interesting way, and concluded by remarking that architects would be more practical if they were to serve for one year as assistant clerk of works under a good man.

The discussion was opened by Mr. Louis Ambler, who proposed that the best thanks of the meeting be passed to the author for the very excellent paper they had listened to. This was seconded by Mr. Arnold S. Tayler, and supported by Messrs. Brady and Walker, on behalf of the Clerks of Works Association, and a most interesting discussion ensued, in which the following gentlemen took part, viz., Messrs. Max Clarke, J. Pain, E. W. Wonnacott, Davis, and G. H. Smith. The vote of thanks was made to include the members of the Clerks of Works Association, who had so kindly attended as visitors, and having been put to the meeting, was carried with acclamation.

Mr. F. G. W. Buss having replied, the meeting terminated.

It was announced that the next meeting of the Section would be held on Friday, February 7th, when Mr. J. Dudley Forsyth has kindly promised to read a paper on "Designing Stained Glass," and it is hoped that Mr. Lewis F. Day will be able to attend as Special Visitor.

COMPETITIONS.

LAYING OUT RECREATION GROUND, GILLINGHAM.—In a recent competition for laying out sixteen acres of land as recreation ground, Gillingham, the first premiated design was submitted by Messrs. Barron & Son, Borrowash, Derby; the second premiated design was by Mr. A. Charlton, jun., Napier-road, Tunbridge Wells; and the third by Mr. George Willis, Carter-street, Greenheys, Manchester.

RE-BUILDING IN PALL MALL.—We notice that the demolition is in progress of the house standing at the north-west of the crossing of Pall Mall with Waterloo-place. It forms a corner house of one of the two blocks erected in Waterloo-place as part of Nash's scheme for the approach from opposite Carlton House northwards, through St. Albans-street and St. James's Market, into Regent-street.

TELEPHONE OFFICES, VICTORIA EMBANKMENT.—In regard to this building, illustrated in our last issue, Mr. Gilbert Seale asks us to mention that he executed all the sculptor's work and carving on the building.

Corners of Old Holland: The "East India" Tower, Enkhuizen.

CORNERS OF OLD HOLLAND.

THE two sketches which we have grouped under the above title are reduced from two illustrations in a highly picturesque volume published by Messrs. Fisher Unwin under the title "Old Dutch Towns and Villages." It consists of a number of drawings in black and white, many of them in a very powerful style though perhaps not free from a certain affectation of archaism, by Mr. W. O. J. Nieuwenkamp and Mr. J. G. Veldheer; the literary descriptions are by Mr. W. J. Tuyn.

The volume contains no information of special interest to architects; it is a work of art in itself, with its fine paper and print and the original style of its illustrations and decorative margins, and it forms a collection of illustrations of a most curious and interesting set of picturesque corners of old buildings in places many of which are out of the beaten track and are little known.

Of the two illustrations we give as examples, the first illustrates a building which, as far as we can understand the vague expressions in the text, is no longer standing. Enkhuizen, which was a very old town, was in the seventeenth and eighteenth centuries one of the largest and wealthiest of the cities of the Zuyder Zee. "Now the harbour is filled up with sand, the herring fisheries are no more, the place has fallen into decay, and it is a mere shadow of its former greatness."

Durgerdam is another of the sea-coast villages. The drawing of the shipyard is a most effective piece of composition in black and white.

We recommend the book to the attention of our readers; they will find much that is of artistic interest in it.

AN ARCHITECT'S DUTIES.

THE following is an abbreviated report of the address delivered by Mr. J. Lavender, the President of the newly-formed "Wolverhampton and District Architectural Association," at their first annual meeting on January 16:—

"May I offer you a few thoughts on an architect's duties:—1. To his client; 2. To his contractor; 3. To his art.

The client should have first demands on our consideration for two reasons: (*a*) He pays our fees; (*b*) he gives the opportunity of showing our skill. I will confine my remarks to the former of these two reasons.

He Pays Our Fees.—Do we always sufficiently realise that consequently our best—our very best—talents on such special work belong to him, and that it would be simply dishonest of us not to give our best to his work. As a rule he puts confidence in his architect and tells him how much he wants to spend; it is for us then to honour that trust, and see, if it

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Corners of Old Holland: The Wharf Shipyard, Dordrecht.

is possible (and I admit it often is not), that our design does not lead him into extra cost; but if, as often happens, the accommodation asked for it is utterly impossible to give for the sum he names, then we should tell him so at once, and not give him reason to think that he can do the work for the sum named when we know he cannot. It is no excuse for us to say, 'Well, if he wants that he will have to pay for it.' I reiterate that the client has bought our talents, and one of them is that we know better than he what a building will cost, and to keep this knowledge from him is, I say, unhesitatingly, dishonest. It may be said, 'But if I tell him it will cost so much he will relinquish the work, and I shall lose the job.' Very well; better so a thousand times than mislead.

But we may see that the building can be built for the money without lavish architectural treatment; then we must relinquish our own wish for architectural display; our first duty is to our client.

Then, as to preparing very careful drawings and specification, we should mind this, for in this way we can spare our client many extras. Our best must be given, so we should consider well every little detail, and not leave it to be cleared up as we go on, and put in an extra for it. Superintendence, too; we must remember we are being paid for this and should not shirk a journey or two, nor say to the builder, 'I leave it to your judgment.' He is not paid for this; we are.

2. *His Duties to the Builder.*—Has he any? Most decidedly. I often think what gracious men the builders must be that they practically place their profit or loss in the hands of the architect. The architect orders this, and it must be done; the architect says that is wrong, and it must be undone. The architect is despotic; he has enormous power; but the confidence thus willingly placed in his hands should be respected. Some architects, I know, are most arbitrary; they are, in other words, too big—too high and mighty. 'I have specified so-and-so, and you are to carry it out.' Are architects infallible? Very often the client considers it is part of a builder's principle to be unprincipled, and that he will take him in if possible, and he goes so far as to warn his architect to be on his guard, for 'builders are rogues.' Now, what should we do without builders? My experience leads me to say that on the whole builders are honourable men and willing to do all that is reasonable. There are exceptions, whom, to my cost, I have had dealings with; but, as a rule, I find builders most obliging and honourable, and the rogues few and far between. A word as to detail drawings. I think a very important duty of an architect to the builder is that he should be prompt in supplying the details he asks for and requires; it is not fair to expect the builder to fulfil his contract if we keep him waiting for details; and yet I am afraid this often happens.

3. *His Duty to his Art.*—Our art has a noble and ancient history; architecture is the most ancient of all arts, its birth being almost coeval with the creation of man upon this earth. Then, as we architects of to-day are the representatives of this ancient art, we owe a great duty to it. When we consider the noble buildings of the Egyptians, the sublime grandeur and most sensitive delicateness of the Grecian, the exquisite proportions of the Roman buildings, then the graceful and soaring Gothic of the Middle Ages, surely the responsibility of our duty appears in all its urgent demands. But how are we doing our duty in the face of so magnificent a heritage? Are we faithful to our high and great legacy? One reason, to my mind, of those past great achievements in architecture was that the architect (as Longfellow tells us) 'built his great heart into these sculptured stones.' Art was first; fees second. Is it so with us? I am afraid we often think of fees first, then our art. We make our art too much of a commercial transaction; our heart should be in our art if we would emulate our great predecessors. It is no answer for us to say, 'Ah! but we have no cathedrals to design and build.' What matter? The Great Architect has given as much care and put as much design and work, perhaps more, into the little butterfly as He has into the monster elephant or shark. And in our small work there is as much need for care and art as in cathedrals or municipal buildings. I say it is our bounden duty to see that we do not neglect these smaller matters.

There is to-day a great tendency towards novelty, for novelty's sake, and you may say, 'Well, our client will have it.' Ah! but our duty to our art demands that we shall not give it. Art first. And I feel confident, if we stick to this determination, the public will yield, and we shall not drag our noble art in the mire of idiotic ignorance and vulgarity. You may say then, what lines would you go upon? I say at once, utilitarian twentieth century lines clothed with the purity of architectural grace. We have been tied and bound too long. Do not be mere copyists and stick too fast to modules and such like; true architecture knows no laws or rules that would hamper requirements. I say again, whatever use demands in building true architecture can give; and it is for us who wield the pencil to work out how it is to be done.

Were the old mediæval designers ever hampered as we allow ourselves to be? When an addition had to be made to a building, though a hundred years had elapsed since its erection, did they go and sketch and copy every detail of moulding and carving that their work might match? We know just the opposite. Hence the great beauty which we now admire in Gothic buildings, especially those which show to us various styles in one building. Were they fools? Did their employers say they did not understand their work? Why, then, are we to be tied down by such despotic ideas that in our new buildings we must be so very careful that our mouldings, &c., are what we please to call 'correct?' I admit that there is appropriateness in the connexion of one kind of moulding with a certain style or order of architecture; but surely there is a limit. Now, if an architect gets a building to erect and sticks a portion of the façade of the Horse Guards to it, it goes for architecture. I grant it may be a good copy, but not art; the honour of it belongs to Kent, the architect of the Horse Guards. But to my mind the architect of the little villa down the road who has first made his plan to suit his client, and then clothed it in elevation with the cloak that will fit it, is by far the nobler man, and has taken up the mantle fallen upon him to more purpose than the robber of other and dead men's brains. But you may say, 'If we don't design according to received models the public will say we are ignorant.' I do not believe it for a moment. Art is art; and if it is true, common-sense, original architecture, it will demand and receive its reward. What a bugbear and hindrance it is to us, the public prejudice for old designs. But we have a duty to our art, and to future generations of architecture, which should incite us to break free from these trammels.

A word on the fashion of trying to be odd and eccentric in our designs. This is, to my mind, one of the worst sins of the present-day architect. If because we want a pretty corner

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in a room on our plans it necessitates a peculiar jutting gable or hip on an elevation, this is legitimate; but to my mind it is a libel upon architecture to make an awkward corner in a building simply to create an odd appearance outside. True architecture, I take it, is first necessity and utility in plan and arrangement; then architecture is so pliable that it will clothe elegantly if the architect has the ability to do it. Again, why should you run up a gable just for appearance? I was in a neighbouring town a short time ago and was greatly surprised to find a most elaborate gable erected over an otherwise good building—it was utterly useless and had to be tied up with an iron rod, as I saw from a distance. Poor, poor architect to stoop to such defacement of this art.

Do you say, then, I do not agree with architectural effect for its own sake? Most certainly I do; but sham in any form I abominate in architecture. A gable is the natural and architectural finish of a span roof: but it is not architecture to form a span roof—a false roof—just to put up an elaborate gable. There are means for architectural embellishment which even to the uneducated eye proclaim the fact at once; but it is degrading to our art, and shows great lack of architectural talent in the architect, to erect constructional features simply and only as ornaments. Let us have purity by all means. I have no quarrel with those who like elaborate or ornate buildings. As much of ornament as you like, only for our art's sake let it be ornament, not constructional features falsely used. Neither let us be odd for oddity's sake. Be true to your art, and your art will serve you in all emergencies."

THE SURVEYORS' INSTITUTION.

THE following is the list of those who have satisfied the examiners at the Preliminary Examination of the Surveyors' Institution, held concurrently in London, Manchester, Dublin, and Glasgow, on January 15 and 16:—

H. A. Adams, Hampstead; H. C. Allen, West Hampstead; H. J. Amoore, Hanwell; W. J. Arnold, Winchester; D. F. Aynsley, Newcastle-on-Tyne; H. J. Baker, Crowborough, Sussex; B. A. Barrows, Exeter; W. W. Batstone, Wandsworth Common; E. G. Bayne, London; C. J. Bingham, Forest Hill, S.E.; A. G. Bird, Kensington; B. Blackbourn, Upper Tooting; R. L. Blake, Southsea; V. H. Blessley, West Hampstead; F. G. Bliss, Watford; H. C. Boden, Fulham; E. Bourdas, Clapham Common; A. E. Bridger, Winchfield; D. F. Broome, Highbury; S. J. Brizaud, London; J. T. Burge, Bristol; F. Carter, Bradford; T. P. N. Chalk, Linton; H. S. Chamberlain, Southsea; C. M. Chaplin, Ipswich; D. W. Clark, Twickenham; H. Clark, Gunnersbury; L. Van Clark, Brockley; M. W. Clarke, Leemount, co. Cork; A. I. Clemesha, North Chiswick; P. T. Clover, Southsea; H. A. Collin; Cambridge; A. H. Corble, Waltham Abbey; A. K. Corfield, Manchester; F. C. Crimes, Kidsgrove; D. Crook, Wimbledon; C. J. Dampney, Ealing; J. Dawson, Halifax; F. E. Dixon, Ryde; W. Dunn, London; F. R. Elloart, London; D. W. Emery, Cosham, Hants; H. C. English, Folkestone; W. Fawkner, Macclesfield; R. J. Godson, Croydon; R. J. Goulston, Sydenham; C. F. Gowing, Norwich; H. G. Green, Ipswich; W. S. Gwynn, London; R. A. Harris, Chichester; H. P. Harrison, Burton-upon-Trent; A. A. Hart,* Southfields; P. G. Hay, Wallington; H. M. Heald, Leeds; C. E. Henderson, Broxbourne; F. J. Henson, Tonbridge; E. A. Hepworth, Manchester; F. V. Hobson, London; R. E. Hollis, Windsor; E. G. Houghton, Woodford Green; E. W. Hughes, Bath; O. G. P. Jack, Hornsey Rise; F. Jackson, Hitchin; A. S. Jones, Clapham Common; C. R. Jones, Wolverhampton; A. H. Jones-Williams, Peterborough; R. W. McL. Keay, Crouch End; H. G. Labdon, Paignton; L. H. Lambert, London; S. Lancaster, Sandgate; T. D. Le May, Tonbridge; H. Mahomed, London; J. V. Makins, Glasgow; M. R. Martin, Chiswick; R. E. Matheson, Leeds; F. W. Matthews, Erdington, Birmingham; J. R. McDonald, Southall; D. R. McDougall, Streatham; F. C. Meager, Swansea; E. H. G. Miller, Old Malden; G. A. Minter, Faversham; F. W. Neate, Newbury; E. Newhouse, Slyne, Lancaster; H. P. Nye, West Battersea; H. B. Owens, Wrexham; B. C. Page, London; E. Page, London; R. B. Pargiter, Uckfield; F. C. Pearson, Morecambe; C. W. Perry, London; E. S. Petch, Scarborough; C. N. Philpot, Wickham; P. T. Power, Walton-on-Thames; S. Preston, London; C. H. Proctor, Burley-in-Wharfedale; W. P. Puddicombe, Swansea; A. J. Purkess, Cirencester; G. N. Rawlence, Salisbury; H. W. Redfern, Hampstead; F. Rendell, Newton Abbot; B. L. Rice, Watford; F. W. Rivers, Reading; J. R. Rogers, Maldon; W. Salter, Ilford; W. E. Salter, Attleborough Hall, Norfolk; E. R. Sarsons, Mosley, Birmingham; H. E. Sherwin' Wandsworth Common; L. Small, Maidstone; H. V. Smith, Egham; P. Smith, Ripon; R. O. Spreckley, Hereford; M. B. Stacey, Reigate; H. E. Steeds, Edgbaston, Birmingham; R. B Stephenson, Darlington; D. C. Stimson, Brixton Hill; W. M. Stokes, Llanidloes; L. Sturt, Tollington Park; C G Talbot, Southend-on Sea; A. C. Taylor, Lee; R. L. Thynne, Wandsworth Common; E. J. Turner, Saltaire; F. Turner, Morley; R. C. Turnham, Finchley; E. L. R. Vining, Sydenham; E. Wickenden, Tunbridge Wells; H. McI. Wicksteed, South Norwood; G. Wilks, Ashby-de-la-Zouch; J. B. Williams, St. Helen's; J. P. Willmot, Ealing; S. M. Wilson, London; R. E. Woodhams, Hastings; A. H. Woolley, Loughborough; S. Young, Brighton.

* Passed at head of list.

ARCHITECTURAL SOCIETIES.

CARDIFF, SOUTH WALES, AND MONMOUTHSHIRE ARCHITECTS' SOCIETY. — At a council meeting of the Cardiff, South Wales, and Monmouthshire Architects' Society, held at Cardiff, under the presidency of Mr. E. W. M. Corbett, Mr. E. M. Bruce-Vaughan referred to the terms of a recent competition for a chapel in Cathedral-road, Cardiff, and eventually, on the proposition of the Chairman, the following resolution was unanimously adopted, and Mr. Dashwood Caple, hon. secretary, was requested to send a printed copy of this resolution to each member of the Society as soon as possible:—"It having been brought before the council that a competition has recently been invited for a chapel in Cardiff, in which the fees to be paid to the successful competitor were utterly inadequate for the work required to be done, the council protest strongly against the competition, and hope no member of the Society has taken part in it or will do in any future case on similar terms."

LIVERPOOL ARCHITECTURAL SOCIETY.—On the 20th ult., in the Law Libraries, Castle-street, Mr. R. Wynne Owen read a paper to members of the Liverpool Architectural Society, under the presidency of Mr. P. C. Thicknesse, on "The Value of Sketching," illustrated by lantern slides and examples of original sketches. Devoting his attention first to the question how to sketch, he advised that it be done alone and with an attitude impervious to inquisitive villagers who may crowd around one, trying to realise the impressions created in the mind by the subject. As to when to sketch, he said it ought to be whenever opportunity occurred, paying attention to architectural history and sequence and the rudiments of construction. In describing what to sketch, he said it should be anything and everything capable of throwing light on, or towards aiding the solution of the problems surrounding architecture at the present time. This, he said, was a policy of progress as opposed to vain repetition.

ULSTER SOCIETY OF ARCHITECTS.—A meeting of the Ulster Society of Architects was held on the 23rd ult. in the offices, 16, High-street, when the chair was occupied by the vice-chairman, Mr. W. J. Gilliland. The minutes of the previous meeting having been read and confirmed, three members and two Associates were elected. The Report of the Council of the Society was then read by the chairman, in which it was stated that since the last meeting of the Society, which was held on December 18, five regular meetings of the Council have taken place, and a number of informal meetings in addition in connexion with the opposition to the clauses proposed by the Belfast Corporation in the omnibus Bill which they are now promoting in Parliament. The terms of the clauses having been ascertained indirectly, the Council considered them very objectionable. A deputation, therefore, was hastily called together, which waited on the Law Committee and requested that a copy of the clauses as promised should be given to them, and, this being done, the deputation proceeded to point out the very serious objections to practically the whole of the proposals. As then drawn, the clauses gave the City Surveyor complete control over the height, character, and design of the elevations fronting or overlooking any street, and also the materials of which it was constructed, without any by-laws or rules of any kind to determine his action in any case, the words being "the surveyor may disapprove of such elevations on the ground that they are in his opinion objectionable," the only relief being a proposal "that any person aggrieved" may appeal "to the Recorder of the City," whose decision was to be final. This clause also provided that drawings showing the elevations of the adjoining buildings to that proposed to be erected or proposed to be altered, and detail drawings drawn to a scale of not less than 2 ft. to 1 in. of such portions as the city surveyor might require should also be lodged. As a result of that deputation the Law Committee struck out those portions of the clauses requiring large-scale drawings and also the drawings of the adjoining premises, with the exception of the height of the adjoining premises, which was retained. The Bill as thus amended came up before the Corporation in committee on December 16, when another deputation of the Council waited on the Corporation and stated further the objections to the clauses of the Bill in their then form. A copy of the Bill, as deposited, was forwarded to the secretary on December 23, and it was then found that the only change which was made from the previous clauses was "the Corporation" was inserted in lieu of "the surveyor." A suggestion had been thrown out by the Lord Mayor, and a communication was made in consequence from the Improvement Committee to the effect that if the Society prepared draft clauses the Corporation would consider them. Meanwhile the opinion of counsel had been obtained, which was received on December 24, and immediately printed, and a copy furnished to every member of the Belfast Corporation. In face of this opinion it was felt that it would be entirely improper for the Council to submit any clauses to the Corporation, and a deputation waited on the Improvement Committee, and informed the members that the principle of the clauses was so vicious and unsatisfactory that the Council could not under the circumstances submit any proposal. On December 31, at a meeting of the Council, Mr. M'Donnell reported that at a meeting of the Corporation in committee a minute had been passed modifying the clauses by the striking out of everything except that referring to the heights of buildings. The position was fully discussed at several meetings of the Council, and at a meeting of the Council of the Royal Institute of the Architects of Ireland, at which one of the Ulster Society representatives attended, the matter was fully discussed, and as a result a resolution was passed unanimously recommending that, owing to the modification of the objectionable clauses so as to leave only the question of heights of buildings to be dealt with, that the Council might frame clauses strictly on the lines of those contained in the London Building Act of 1894 relative to the heights of buildings, and also constitute a tribunal of appeal on precisely similar lines to that provided by that Act. The Council, therefore, considered and approved of clauses drawn in this way, which were ordered to be printed in parallel columns with those from the London Act, and, together with a copy of the resolution passed by the R.I.A.I. before referred to, were forwarded to every member of the Corporation. These clauses do not seem to have been considered by the members of the Corporation interested in the promotion of the bill, and from speeches made at a meeting of the Council to approve of the bill generally it was perfectly obvious that some of the Corporators who undertook to deal with the matter in public had not even read them. The bill was approved of, three members voting against, with special reference to these objections. Notwithstanding the minute of the Corporation striking out everything except those portions of the clauses which referred to the height of buildings, the bill, as deposited, retains the whole of the objectionable clauses as described, as well as those referring to the heights of buildings. A letter was received from the secretary of the R.I.B.A., dated January 14, 1902, approving of the resolution passed by the R.I.A.I. on January 6, on the basis of which the Council had taken action. A resolution was unanimously passed by the Council at a meeting on the 16th inst. to the following effect:—"That the Council recommend the Society to petition against Part V. of the Belfast Corporation Bill." Opinion of counsel has been further taken as to our action, and he advises that it would be quite possible for the Corporation, if there were no opposition, to carry through the clauses as in the deposited Bill, notwithstanding the minute of the Corporation in committee, and he suggests that we should ask for a formal guarantee from the Corporation.—Mr. W. J. Fennell then proposed—That a formal letter be addressed to the Town Clerk asking that a guarantee be

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given by the Corporation as follows: 1. That all reference to character and design shall be struck out in the Bill in committee on the application of the promoters. 2. That the restriction as to the height shall not be one depending solely on the discretion of the Municipal Authority, but shall be a power confined within limits such as pointed out in the clauses submitted by the Society. 3. That the court of appeal shall be constituted on the lines suggested by the Society. 4. That all amendments for the purpose of carrying out Nos. 2 and 3 shall be submitted to the Society one week before the Bill be read a first time.—This was seconded by Mr. T H. Tulloch, and passed unanimously.—Mr. J. J. M'Donnell, J.P., moved that if a satisfactory reply be not received within two weeks, that it be an instruction to the council of the Society to take such steps as they may be advised to oppose the Bill of the Belfast Corporation before Parliament, and that for such purpose a guarantee fund be now opened.—Mr. N. Fitzsimons seconded the resolution, which was passed.—The Chairman said their President, Sir Thomas Drew, had expressed the wish to be allowed to head the guarantee fund. The Institute of Architects for Ireland had promised to subscribe, and he expected to get authorisation also from the Royal Institute of British Architects.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At a meeting of this Association, in the rooms at 117, George-street, on the 22nd ult. Mr. Henry F. Kerr, the President, in the chair, Professor Baldwin Brown read a paper on "The Dome as an Architectural Form." The purpose of the paper, it was explained, was to bring into view the general æsthetic character of the dome, and more particularly to vindicate for it a place among the architectural forms suited for a Christian church. The main characteristic of the dome in general was its embracing, uniting quality, and it was important so to employ it as to obtain from it its full value as a unifying element in a composition. The employment of the dome as a mere roof, as in the multiplied domes of later Byzantine churches, such as St. Mark's at Venice, or the series of cupolas along a rectangular aisle as in churches of the west of France, was not the way to secure all the advantages of that most beautiful and expressive feature. The dome, wherever it appeared, lent distinction to a building, and it had been rightly pronounced to be on the whole the most satisfying to the æsthetic sense of all architectural forms. The real power of the dome was, however, only exhibited when it was made to exercise an influence far beyond the limits subtended by its own circumference, and brought into harmony the complex elements of a sub-divided plan. The Pantheon of Hadrian at Rome, the starting point of the development of dome construction in the modern world, completely embraced the spaces of the plan it surmounted, but this plan was that of a regular unbroken circle. The Christian builders desired to use the dome for their own purposes; but such a plan as that of the Pantheon was not suited for a Christian meeting-house. One of the most interesting chapters in the whole history of architecture was occupied with various experiments made by early Christian architects to adapt the dome to plans suited to the requirements of congregational worship. Their efforts to overcome the difficulties which presented themselves were sufficient proof that they recognised the dome as a form not only beautiful in itself, but expressive of Christian ideas, and this was a consideration too often lost sight of by the mediævalists of to-day, who, as the discussions connected with the new Liverpool Cathedral had shown, were still dominated by the ideas embodied in the Gothic revival of the first half of the nineteenth century. The efforts referred to were ultimately crowned with success, when the architect of Justinian's Church of Sta. Sophia at Constantinople combined the dome with the rectangular ground plan normal in the Christian meeting house. It was a curious fact that after Sta. Sophia the planning of domed churches retrograded, and small cupolas were multiplied over the arms and intersection of Greek crosses, or distributed like the five on a dominoe over a square. Some later Turkish mosques seemed, however, to show a revival of the Sta. Sophia tradition. Meanwhile, other points of interest in the history of dome construction emerged, the chief of which was the employment of the cupola in later Byzantine architecture, and again at the Renaissance as an external rather than an internal feature. There was a fine field open for the efforts of the modern designer in the direction indicated by Sta. Sophia. The triapsidal plan, that could be effectively combined with a central dome, offered opportunities for experiments, and these might result in a centralised church for congregational purposes, free from the suggestion of mystical sacerdotalism which clung to the mediæval fane, and recalling the glories of some of the early Christian domed structures that had passed away. If architectural students who went to Cologne would shorten their stay in the Gothic Cathedral, and spend more time in St. Mary of the Capitol or the Apostles' Church, some fresh and promising elements might be imparted into the church architecture of the day. Some discussion followed the reading of the paper, which was illustrated by numerous lantern slides, drawings, &c.

WOLVERHAMPTON AND DISTRICT ARCHITECTURAL ASSOCIATION.—The first annual general meeting of this Association was held at the Law Library-rooms, Wolverhampton, on January 16. The annual report of the Council for the year 1901 was read and adopted, and the Treasurer's statement of accounts passed and approved. The following officers were re-elected for 1902:—President, Mr. J. Lavender, F.R.I.B.A.; Vice-President, Mr. G. H. Stanger, F.R.I.B.A.; Council, Messrs. F. Hunter Lynes, A.R.I.B.A., T. H. Fleeming, S. H. Eachus; Hon. Treasurer, Mr. J. Harrison Weller; Hon. Secretary, Mr. W. Edwards (25, Darlington-street, Wolverhampton); Auditor, Mr. W. J. Oliver. The President then gave what appears to have been an exceedingly spirited and sensible address to the members, of which an abbreviated report will be found on another page.

THE LONDON COUNTY COUNCIL.

THE weekly meeting of this Council was held at Spring-gardens on Tuesday, Mr. Torrance, Chairman, presiding.

Loans.—The following loans were granted:—2,730*l.* to the Bethnal Green Borough Council for paving works; 10,455*l.* to Hammersmith Borough Council for electric light installation; 2,050*l.* to Stepney Borough Council for street improvements; and 1,200*l.* to Marylebone Guardians for works at workhouse.

Resignation of the Works Manager.—Mr. McDougall brought up the Report of the General Purposes Committee, which stated that a letter had been received from Mr. W. Adams, the Manager of Works, resigning his appointment. In his letter communicating this decision Mr. Adams wrote:—

"The duties of Manager of the Works Department, under existing conditions, involve so much anxiety, and have been the cause during the past few months of so much nervous prostration, that I feel my continuance in that position can only result in a breakdown of my health, and that the time has arrived when I should resign the appointment. During my five years of office I have done my utmost to secure the success of the Department which I have so much at heart, and only regret that this step should become necessary. The result of the working of the Department from the date of my appointment in February, 1897, shows, notwithstanding the large excess in the case of North Woolwich pumping-station, which is fully explained in my detailed Report, a net balance of only 378*l.* in excess of the estimates and schedule values, being ¾ per cent. on a total expenditure of 602,320*l.* Personally, I think the results have been very satisfactory, especially bearing in mind the many and great advantages which do not show on paper; and that, with certain modifications in the system, it only needs that other departments should also work loyally for its success for the Works Department to be one of the most gratifying of the Council's undertakings. I leave entirely to the Council to fix the date when I relinquish the position with which they have honoured me, and, if the Council should consider it advisable, I should be happy to remain with my successor until he has become thoroughly acquainted with the requirements and work of the Department."

"'Under the circumstances' (the Committee reported) 'we see no alternative but to recommend that Mr. Adams's resignation be accepted, and we have conveyed to him an expression of our regret on behalf of the Council at his ill-health, and of our hope that a cessation from work will lead to a speedy recovery. We are considering the arrangements to be made consequent on Mr. Adams's resignation, and until we are in a position to report further the Council will no doubt be glad to avail itself of the offer which Mr. Adams has been good enough to make with regard to the date of his resignation, and we therefore propose for the present to leave the date open. We recommend:—That the resignation of Mr. W. Adams, Manager of Works, be accepted as from a date to be hereafter fixed.'"

In the course of a short discussion Mr. Dodson urged that a change in the system of the Works Department was wanted, so as to relieve the Manager of so much anxiety.

Mr. Alfred Smith expressed gratification that the work carried out under Mr. Adams showed a highly satisfactory result as regards cost compared with estimates. The recommendation was adopted.

Electrification for Tramways.—The Highways Committee presented a Report, with estimates for 68,000*l.* and 576,350*l.*, with regard to electrifying a portion of the Council's tramway system in South London, covering a length of 19¼ miles of single track.

The Finance Committee, reporting upon the financial bearings of the scheme, stated that it was proposed to spread the repayment of the 68,000*l.* required for new buildings and bridge construction over the full period of not exceeding sixty years, while the cost (576,350*l.*) of lines, machinery, generating plant, rolling-stock, equipment, and alterations to existing buildings would be spread over twenty-five years. The Committee assumed that the Council would earn a profit on electrical working of 6d. per mile run instead of 2d. per mile on horse traction, or an increase of profit of about 4d. per mile for the 4,700,000 miles per annum at present run, or 78,333*l.* a year. But in addition to this the Highways Committee anticipated that, owing to the increased speed at which the cars would travel and to the popularity of the system, the traffic would increase, and they considered it quite safe to estimate for an increased car mileage of 1,000,000 per annum. This estimate also was supported by the experience of other similar undertakings. On this extra mileage there would be an additional profit (at 6d. per mile) of 25,000*l.*, making a total estimated increase in the profit on working of, say, 103,000*l.* Out of this would have to be paid interest and sinking fund charges on the cost of conversion, which, excluding items relating to the supply of power (covered by the 6d. a mile estimate for working expenses) amounted to 573,500*l.* Interest on this sum at 3¼ per cent. would be 18,640*l.*, and the annual charge for repayment (68,000*l.* in fifty-nine years and the balance in twenty-five years) would be 21,373*l.*, making together 40,013*l.*, which, however, would decrease as the debt was paid off. Thus it was evident that the result of conversion would be advantageous financially.

After some discussion on details the estimates presented by the Highways Committee were approved.

The Westminster Improvements.—In connexion with the Westminster improvements, the Improvements Committee submitted a supplemental estimate of 6,750*l.* The Committee pointed out that they were authorised to spend 1,315,000*l.* on capital account for the purpose of extending the Thames Embankment to Millbank. The estimate of the gross cost of the improvement was based upon the assumption that no property would be acquired outside the limits of deviation shown upon the plan sanctioned by Parliament. During their negotiations for the acquisition of the interests in certain properties in Tufton-street and Little Tufton-street within the limits of deviation an opportunity arose for the acquisition by agreement upon favourable terms of the superior interests in adjacent properties in Tufton-street and Romney-street beyond the limits of deviation. The cost of acquiring the freehold interest had been 6,000*l.*, and of the leasehold interest 590*l.*, together with 60*l.* 10s. for surveyor's fees and solicitor's costs, making a total of 6,650*l.* 10s. There would probably be further expenditure amounting to about 100*l.*, and the total estimate which they were submitting to the Council was, therefore, 6,750*l.* It was not anticipated that the acquisition of these properties would involve any increase in the ultimate net cost of the improvement, as the expenditure would be counterbalanced by the value of the site as surplus land. It was necessary, however, for them to submit to the Council an estimate of the amount by which the gross cost of the improvement would be increased, as provision was not made in the estimate already passed by the Council for the expenditure to be in-

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curred in respect of the acquisition of these properties.

The Council assented to the supplementary estimate.

Technical Education.—The Technical Education Board, in a Report on the successes obtained by students at their polytechnics, stated that at the Battersea Polytechnic a number of students had secured promotion in the building trades, while twelve at Regent-street had obtained appointments as managers and assistant managers in engineering firms. Several students in the architectural department had obtained important appointments in telegraph, locomotive, shipbuilding works, and Government and municipal offices.

Acetylene Gas.—The Theatres and Music-halls Committee submitted a series of regulations in connexion with the use of acetylene gas. *Inter alia*, they provided that the pressure shall not exceed 20 in. in the generator, or 5 in. in the holder or service pipes; that the gas shall not be mixed with oxygen or with atmospheric air before it reaches the burner; and that every apparatus used shall be licensed by the Council after it has been tested and approved by experts.

The draft regulations were approved.

Architects' Department.—The Establishments Committee reported that Mr. D W. Kennedy had resigned the position of senior assistant in the Architects' Department. A recommendation that the resignation be accepted and that a successor be advertised for was adopted.

New Police Office on Victoria Embankment.—The Highways Committee reminded the Council that on October 29 last year they acceded, on certain conditions, to a request made by Sir J. Wolfe Barry for permission to erect, and maintain for a period of three months, a hoarding round the site of the proposed extension of the Metropolitan Police office on the Victoria Embankment, and to place a temporary wooden footway along the outer side of the hoarding. The decision of the Council having been communicated to Sir J. Wolfe Barry, he suggested that, having regard to certain of the conditions imposed by the Council, it might be more convenient if the permission to erect the hoarding were to be given to the contractors for the erection of the building rather than to himself, and he accordingly withdrew his application. Messrs. E. Lawrance & Sons, the contractors, had since asked for permission to place round the site of the new buildings a hoarding somewhat longer than was proposed in the original application, but projecting less over the public way, and to place round the hoarding a temporary footway; and the Committee thought that permission may be granted upon the same conditions as in the previous case. They recommended accordingly.

This was adopted.

The Horniman Museum.—The Historical Records and Buildings Committee presented a Report on the staffing of the Horniman Museum. They recommended:—That Dr. A. C. Haddon, F.R.S., be appointed advisory curator at an annual fee of 50 guineas, together with an allowance of 25*l.* a year for travelling expenses; that, subject to his passing the necessary medical examination, Mr. Richard Quick be appointed resident curator at the salary of 300*l.* a year, and Mr. Frank Slade and Mr. Andrew William Pepper natural history assistant and librarian respectively at the salary of 130*l.* a year each.

These recommendations were agreed to, and the Committee added, for the information of the Council, that since the opening of the Museum there had been 184,862 visitors to it.

Arbitration Clauses.—On the motion of Mr. Sears, seconded by Mr. Benn, the Council resolved:—"That it be referred to the General Purposes Committee to consider and report as to the advisability of modifying the arbitration clause in the Council's contracts, so that whilst questions affecting the conduct of the works should remain subject to the sole control and decision of the chief officers of the Council, questions of dispute relating to accounts and claims should be referred to an independent and outside arbitrator, and then only on the termination of the contract."

COTTAGE HOMES, BARNSTAPLE.—A series of cottage homes has been built during the past year on a site opposite the main entrance to the workhouse at Barnstaple. The buildings were designed by Mr. W. C. Oliver, architect, and built by Mr. W. Cooke.

Illustrations.

ILLUSTRATIONS OF RIMINI CATHEDRAL.

IN the *Builder* for May 25, 1901, we gave two illustrations of the interior of this remarkable church, a fourteenth-century Gothic church transformed more or less into a Renaissance one, a century later, by Alberti, at the bidding of Sigismund Malatesta.

The exterior view shows the south side with the classic arcade with which Alberti masked the Gothic architecture, and the sarcophagi in which were deposited the remains of some of the great men whom Malatesta had collected around him.

Another illustration shows a portion of the marble balustrade in front of the chapels, a very fine example of the flat and severe style of early Italian Renaissance carving. In another illustration the decoration of the spandrels of two of the chapel arches is shown.

The sheet of various details of sculpture is a curious assemblage of things which do not seem to belong to the same style or school; the three bas-reliefs of angels especially look as if they belonged to an earlier date than Alberti. It is known that some of the interior decoration consisted of the spoils of other buildings, and probably these bas-reliefs were among them.

CIBORIUM, SAN DOMINICO, SIENNA.

THIS marble ciborium is placed over the high altar in the church of San Dominico, Sienna. It is an extremely delicate piece of work attributed to Benedetto da Maiano. The position in which it is placed makes it difficult to obtain a good point of view, and it is consequently little noticed by visitors. The present sketch was made some height from the ground from the one possible place, which suffers, unfortunately, from the lower square portion of the base on that side being a restoration; on the other three the work is original. The drawing was made *in situ*.

FIRE TESTS WITH AUSTRALIAN HARDWOOD FLOORS AND DOORS.

SOME important tests were undertaken on Wednesday afternoon by the British Fire Prevention Committee, the occasion bringing together an unusually large assemblage of public officials, architects, surveyors, and engineers, including several representatives from the Continent. The visitors were received by Mr. Edwin O. Sachs (Chairman) on behalf of the Executive, and Mr. H. H. Collins (District Surveyor for the City of London) on behalf of the Council, and among those present were Commander Welsch, who had arrived from Ghent on behalf of the Belgian Government, and Major Fox, of the London Salvage Corps, whilst there was also a specially strong representation of the fire insurance offices.

Preceding the general reception, a luncheon was given by the Executive, at which, in the course of the toasts, it transpired that a scheme for utilising the results of the British tests abroad was on foot. Mr. Sachs, Mr. Collins, and Commander Welsch spoke on this subject at some length.

The particular test which occasioned primary interest was that of a large warehouse floor of Karri and Jarrah wood, comprising supports of timber, beams of timber, and a floor of timber, the whole carrying a load of 200 lbs. per square foot, and being subjected to a fire of gradually increasing temperature for a period of two hours up to 2,000 deg. Fahr. Although the fire broke through the floor towards the end of the test in several places, the beams of timber withstood the strain in an eminently satisfactory manner, the load being supported to the very end.

Another test was with Karri and Jarrah hardwood doors of 2 in. thickness, subjected to a similar fire of increasing severity for the period of one hour, when it was observed that the Jarrah door of seasoned material withstood the fire far better than the Karri door, which, however, happened to be of a fresh material.

The tests, which commenced at 12.30 and lasted until 4 p.m., were favoured by exceptionally fine weather, but, owing to the severe frost, the hose-pipes by which water was applied at the end of the large-floor test, became frozen, and it was a pleasure to see how some men of the London Salvage Corps, who were in attendance on Major Fox, came to the rescue with hand-pumps in their usual smart way.

Books.

Building Specifications. By JOHN LEANING, F.S.I. London: B. T. Batsford. 1901.

WE must believe that there is a demand for books of the kind to which this new work of Mr. Leaning's and Mr. Macey's "Specifications in Detail" belong, which might more properly be called books of instruction on construction of a more advanced nature than the ordinary text-books. They, no doubt, will be found useful by those members of the profession who are just passing from the state of pupilage to that of assistants, or even, as we know many young men are doing to-day, venturing on the troubled sea of independent practice without sufficient ballast of experience. When a man knows how to construct the work which he is to carry out, he does not need any such book as that by Mr. Leaning or Mr. Macey. Books on advanced construction, dealing with problems of a similar character to those that present themselves in every-day practice—the application, that is, of what is taught in text books—are surprisingly few as regards the work of the architectural profession. Mr. Leaning, therefore, has to instruct his readers in the construction as much as in the description of work to be carried out. From this point of view, this new work is one that can honestly be recommended to students, but they should be on their guard not to put into their actual specifications all that they find in Mr. Leaning's descriptions or illustrations. Many, in fact, of the illustrations in the book should be by the young architect shown in his ½-in. detailed drawings, not made marginal notes in the specifications, as, for example, the sketches given of children's galleries for use in schools.

It is a bold thing for any man, even though he be a quantity surveyor, and therefore necessarily possessed of sound knowledge of construction, to venture on a description of so many specialised forms of work as Mr. Leaning has included in his book, and it is very easy to find faults in the descriptions and illustrations which are therein given, as, for example, in the illustration of loophole doors; no cleats are mentioned, although they are in very many cases absolutely imperative.

The method described by the author of laying wood blocks in Stockholm tar only, is one that cannot be absolutely relied upon for durability; the section and description of rain water tank is not quite the best form, and is deficient in one or two particulars.

The book, however, is printed with good margins, so that the young architect has the opportunity of annotating, and to make the book thoroughly valuable should use his opportunities of observation freely and make copious amendments, taking nothing for granted because it appears in print, but keeping an open mind and learning by experience, so that, when he comes to have pupils of his own, Mr. Leaning's book, with plenty of added notes, will be very useful to them.

Quantity surveyors are notoriously conservative in their methods of construction, and to this fact we may credit the inclusion of the now, happily, almost obsolete fashion of enclosing a bath with wood framing. The student would do well to run his pen through this portion of the book, and note at the side "Never use this." The same spirit of conservatism probably accounts for the fact that the construction of brick sewers is described, but not of those of concrete.

The specification of the precise method of carrying out shoring with rigidly fixed scantlings of timbers and detail drawings is not, save in exceptional instances, the usual practice of architects, although it would be of considerable assistance to the quantity surveyor in measuring "use and waste." Young architects may, however, be warned that such rigid definition would generally add to the cost of work, as a contractor can frequently carry out shoring with the same efficiency, but at less cost, by using material that he may happen to have, instead of being obliged to buy special baulks for the job.

The preparation of conditions of contract is

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well dealt with by Mr. Leaning at considerable length, but we cannot agree with the author's dictum that the conditions should form a part of the specification; they merely increase the number of pages which a foreman has to handle and turn over, and are really very little concerned with his part in the carrying out of the building, so that it is, in our opinion, far better that they should form part of the contract to which they properly belong; and this is a document that many builders make a point of carefully keeping out of the hands of their foremen. The student should be warned that the author's description of fireproof floors must in particular be taken *cum grano*. In particular, as might be gathered from the letter which recently appeared in our columns from Mr. Atkinson, the author's statement that in combinations of iron and concrete "no chemical action occurs between the iron and the moisture in the concrete" is one which recent investigation has suggested—although generally assumed as correct—to be unfortunately fallacious. The sections of fireproof floors shown cannot in all cases be properly so described, and would not even "resist its effects for a long time."

Mr. Leaning seems to think that the quantity surveyor should write the specification, and observes that the proposal has elicited "much virtuous but irrational indignation from those who maintain that the architect should write all his own specifications." There is no occasion for indignation, but we disagree *in toto* with the theory of delivering over the writing of the specification to the quantity surveyor; and in our opinion an architect who does so puts himself in an undignified position, and is apt to lose his grip over the building. Of course we agree that an architect is not to waste his own personal time over writing stereotyped directions which occur in every specification; there should be a lithographed skeleton form for these things, to be filled in with special requirements; but the special requirements should be draughted by the architect, at all events, and written in his office by one of his own staff, if not by himself. The function of the quantity surveyor is to measure and state the quantities, and should be confined to that. Of course, if architects hand over their specification writing to the quantity surveyor, they can hardly be surprised if the latter gets into the habit of speaking of the resulting erection as "one of my buildings," a phrase which we have heard used; and architects who do not like that position will do wisely not to give ground for it by allowing the quantity surveyor to usurp what should be their own function.

Builders' Accounts. By JOHN A. WALBANK, A.C.A. ("The Accountants' Library," Vol. III.) London: Gee & Co., 62, Moorgate-street, E.C. 1901.

THE author of this little work is evidently thoroughly acquainted with the subject he has dealt with, although, as he has placed it before us, it appears to be somewhat academically elaborate; in fact, to such an extent that we doubt whether any firm, however large, would think it necessary to adopt such an intricate system as that here set forth. Builders' book-keeping is necessarily a somewhat complex business, and niggardliness in the book-keeping department is not to be defended in any way. On the other hand, we have known builders who have come to grief through getting entangled in the meshes of a complicated system, thus neglecting the practical side of the business. A formidable list of the books required is given on page 2, and even this would not cover all that would be necessary. We are under the impression that most builders would dispense with a good many of these. Despite the importance attached by the author to the "Register of Tenders," with its elaborate subdivision, we think that most builders would content themselves with merely the lists of tenders sent in. Even were they not content with this, in very few instances would they have the opportunity of comparing the details of the various trades. The author's assertion that it is useful to see "in what respects his [the builder's] tender has been faulty" leads one to remark that, instead of relying upon such support as this, the builder should see that his estimating staff was efficient.

"The foreman's daily return" is, we think, unnecessary, taking up the foreman's time when it might be more profitably employed the usual weekly returns covering all that is necessary. We are sorry to see the author recognising the demoralising system of "subbing" by suggesting a "sub wages cash book." "Subbing" may be necessary to a small extent at the commencement of a job, but it should be discouraged in every possible way by the employer.

In most of the examples of books given the subdivision is too elaborate. The stores books, "Issued" and "Returned," also the "Machinery and Plant Ledger," are not sufficiently insisted upon usually, and the author's advice here may well be followed, as also in connexion with an "Annual Profit and Loss Account," which we fear is not so systematically prepared as it should be. We think in this connexion also the author might have put forward the advisability of having accounts audited annually by a qualified firm of auditors, as well as an annual stocktaking of all plant and materials.

The author, on pp. 55, &c., explains a modified form to meet the case of a "small" builder. We are afraid that, notwithstanding the arguments put forward for the main system (and there is a good deal to be said for the truth of these), many *large* builders will lean towards the modified system, relying to a large extent on the "close supervision" mentioned on page 55. This, after all, is a very important factor in the management of a builder's business.

Although we may not be prepared to adopt all the author's suggestions, for the reasons before given, the work will well repay perusal, and a great many useful hints may be obtained from it to be adopted with discretion.

Lockwood's Builder's, Architect's, Contractor's, and Engineer's Price Book for 1902. Edited by FRANCIS T. W. MILLER, A.R.I.B.A. London: Crosby Lockwood & Son.

WITH the commencement of a new year arrives a procession of annual volumes, some of which we have got to look upon as old friends, while others die at an early age after vainly endeavouring to secure a place in the ever-increasing army of "annuals." Amongst those to be placed in the first class above mentioned is the volume now under notice, which has deservedly taken its place amongst those aids to estimating known as "price books." As the editor says in the preface, last year (whatever it may have been in other fields) was an uneventful one in the building trade; consequently prices have remained almost stationary. It follows, therefore, that this edition, with very few exceptions, is practically a reprint of that of 1901. We are glad to see that what must now be regarded as a permanent fall in the price of bricks has been recognised; 40s. per thousand being now taken as a basis, against that of 54s. for 1901, although there is a little discrepancy in the working out of the prices of brickwork, if we use the note given in the heading. The fall in the price of lead has also been noted. Given a knowledge of the subject at the commencement, this work will be found of use as an aid, but, as we have pointed out before, no price book will take the place of practical experience. This remark, however, will, in a lesser or greater degree, apply to all text-books on professional or business matters.

The Green Slates of the Lake District. By T. MELLARD READE, F.G.S., and PHILIP HOLLAND, F.I.C., F.G.S. Reprinted from the Proceedings of the Liverpool Geological Society. 1901.

THE authors of this pamphlet have done good service, both to architects and geologists, by taking in hand the investigation of the chemical and physical structure of the well-known green slates of the Lake District. They have been materially assisted in their work by Mr. Maynard Hutchings, F.G.S., who gives concise descriptions of the mineral characteristics, chiefly derived from micro-examination, of the several slates referred to. The green slates of Buttermere, Tilberthwaite, and neighbouring localities form excellent roofing material and are largely in request, but the authors remark that from their greater thickness, and consequent extra cost of carriage, they are more expensive to use in Liverpool than the ordinary blue Velenhelli or Penrhyn slates from Wales. "Green slates are to be obtained from Wales, but the area in which the rock is quarried is limited, and the brighter green does not always satisfy the artistic eye. The green slates of the Lake District are essentially made up of volcanic ejectamenta, whereas the Welsh slates, including the green variety, are what are called 'clay slates,' and are of clastic sedimentary origin."

A specimen of Elterwater green slate is described as being about $\frac{1}{16}$ in. in thickness, cleaving with a rather rough surface, but is a good strong material of a grey green colour. It is estimated that this slate contains 12·29 per cent. of calcite, and a portion, after remaining in dilute nitric acid for twenty-four hours, was seen to be covered with little pit marks, the cavities formerly occupied by the calcite, which mineral was removed by the acid. One of the specimens left in the acid for a week did not show any further disintegrative effects. The authors observe that the object of this somewhat severe experiment was to ascertain whether, under the much milder influence of ordinary atmospheric weathering, the slate would be likely to be injuriously affected. It would appear, however, from the mode of distribution of the calcite and its proportion to the total constituents of the slate, that this is unlikely to be the case. Nevertheless, one of the authors who had occasion to have a Tilberthwaite green slate taken off a roof, in order to get the colour matched for an extension of the building, found that the surface exposed to the weather (for about three years) was of a lighter green than the under surface, which in colour matched the newly-quarried slates with which it was compared. We imagine that this change of tint on the weathered surface is in some way connected with the iron, of which the slate contains a great deal.

A Buttermere green slate is described as having a smoother cleavage surface, is deep green in colour, whilst it possesses a glossy micaceous sheen. The slates from this locality are distinguished by the parallel banding due to the difference in the composition or degree of fineness of grain of the bands. The "best dark green," Tilberthwaite (Coniston) slate, quarried by a Kendal firm, is described as excellent for building purposes, being strong, sound, of a good dark green that keeps its colour; the surface is not quite so micaceous as some of the Buttermere slates. Some Welsh slates are then referred to by way of comparison, and the micro-sections, reproduced from direct photographs, are explained. The work concludes with some observations on the origin of slaty cleavage and a table of chemical analyses. We have nothing but praise for this excellent piece of work; the authors have succeeded in compressing into a few pages a considerable amount of valuable information, based for the most part on original research.

The Centrifugal Pump, Turbines, and Water Motors. Third and Enlarged Edition. By CHARLES H. INNES, M.A. 1901: The Technical Publishing Co., Ltd. Manchester.

PREVIOUS editions of this book were devoted to water motors and centrifugal pumps, with introductory chapters relating to the theory of hydraulics. Consequently it was a self-contained and complete treatise on those departments of hydraulic engineering. In the present issue other matter is introduced, which takes away the exclusively hydraulic character of the work, and rather tends to disturb its homogeneity. We quite admit that the new chapters on "Steam Turbines" and "Pans" are useful, and that the theory of such machines is very similar to that of analagous hydraulic appliances, but they could be more satisfactorily discussed in a separate volume, where necessary theoretical principles would be explained fully, and in which would be contained particulars of various steam turbines and motors, and of various types of machines intended to propel or to be propelled by air or gases. A new chapter on the important subject of watermeters would have been welcome, and perhaps, more appropriate in Mr. Innes's book than either of those now added. Chapter XIV., contains a method of designing reaction turbines, which is largely graphical, and is taken from M. A. Rateau's "Traité des Turbo-Machines," and in the chapters relating to centrifugal pumps some drawings and descriptions of pumps designed by the same author are reproduced. These are most serviceable additions and deserve careful perusal. In Chapter XXIII. is a well illustrated account of the Parsons steam

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turbine, including some highly interesting tests and other details taken from the minutes of the Institution of Mining Engineers. This chapter is purely descriptive and so differs in character from the bulk of the treatise. Moreover, no attempt is made to discuss other forms of steam turbine or to institute comparisons relating to the efficiency of this type of motor. Two short chapters are devoted to fans, of which the examples given cannot be considered as an altogether representative selection of those made in the present day. Therefore, in this respect as in that of the steam turbine, our preliminary criticism appears to be justified. So far as the hydraulic portion is concerned the treatment is satisfactory and clear, and the work as a whole will certainly continue to be of considerable practical service to engineering students and others interested in the application of hydraulic and kindred machinery.

The Bacterial Purification of Sewage, being a Practical Account of the various Modern Biological Methods of Purifying Sewage. By SIDNEY BARWISE, M.D., D.P.H. London: Crosby Lockwood & Son. 1901.

THIS book is intended as a supplement to Dr. Barwise's excellent little work on "The Purification of Sewage" published nearly three years ago (not *two*, as stated in the preface) It is only a small book, and Dr. Barwise glories in the fact—"One of the evils of books of the present day is that they are infinitely too wordy; a fault, at least, of which this little work is not guilty." The treatise consists of about 16,000 words (equal to the matter contained in seven pages of the *Builder*). By means of large type and black-letter paragraph headings the publishers have succeeded in spreading the text over forty-eight pages, and have given the book an imposing appearance by including in it an equal number of pages of their own advertisements, and by the use of heavy paper and thick bevel-edged boards. The price of the lot is 6s. net. The natural exasperation which one feels on glancing through a book thus made up is, however, tempered when it is carefully read. Dr. Barwise writes with knowledge and with a due sense of proportion. The various stages in the bacterial purification of sewage are clearly and succinctly stated, and details are given as to the quantity of sewage, the capacity of tanks and filter-beds, filtering materials, methods of sewage-distribution, rate of filtration, and degree of purification effected. Valuable hints are given as to the methods which will prove most suitable under different conditions.

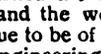
The illustrations consist of six plates, three full-page diagrams, and two folding diagrams. These last give plans and sections of purification works suitable for populations of 100, 1,000 and 2,000 persons. For the "engineering details" Mr. J. Somes Story, M.Inst.C.E., County Surveyor of Derby, and Mr. George Story, C.E., are, according to the preface, "responsible."

The book contains more information than many a work of twice the size, and can be recommended as an impartial and trustworthy account of modern methods of bacterial purification. The proofs might with advantage have been more carefully read, particularly with regard to the punctuation; and on page 37 the proportionate increase of the area of contact-beds required for two fillings a day instead of three should be 50 per cent., not 33 per cent.

The Water Supply and Sewerage of Country Mansions and Estates. By E. BAILEY-DENTON, M.Inst.C.E., &c. London: E. & F. N. Spon, Ltd. 1901.

THIS little book of seventy-six pages is described as a course of lectures delivered to the students of the Royal Agricultural College, Cirencester, and the South-Eastern Agricultural College, Wye. It is divided into four parts—water supply, sewerage, sewage disposal, and loans. The limits imposed by a short course of lectures have precluded a thorough treatment of these subjects, but the author has succeeded in compressing a considerable amount of valuable information into the space at his disposal. No mention is made of the best types of domestic filters, such as the Pasteur (Chamberland) and the Berkefeld, and some of the author's hints on sanitary fittings are scarcely abreast of modern practice; for example, he considers that short sink-wastes need not be trapped, and makes no mention of traps for the waste-pipes of baths and lavatories. The lecture on sewage disposal is mainly concerned with land treatment, and does not contain any reference to the best modern bacteriological methods of disposal, although these have been adopted for a number of mansions in different parts of the country. The book, however, is full of useful hints, and cannot fail to be of service to the young engineer and estate-agent.

The Continuous Sewage Filter. By F. WALLIS STODDART, F.I.C., F.C.S. Bristol: J. Wright & Co. 1901.

THIS pamphlet of forty pages is primarily an account of the special apparatus invented by Mr. Stoddart for distributing partially-purified sewage over the surface of a percolating filter. A comparison is instituted between percolating filters and contact-beds to the advantage of the former. We have already described Mr. Stoddart's distributor, and need only repeat that it consists of a series of corrugations thus  , with notches cut at intervals in the upper angles, so that the sewage can overflow at a great number of points. The apparatus is already in successful operation, the installations at Knowle and Horfield and at a country mansion being illustrated and described in the pamphlet. Some information as to sewage purification generally is also given, including the quantities dealt with and the chemical and bacterial character of effluents. The pamphlet is worth reading, but Mr. Stoddart ought to have stated clearly that he is the inventor of the apparatus which he recommends.

Elementary Practical Hygiene (Section I.). By WILLIAM S. FURNEAUX. London: Longmans, Green, & Co. 1901. 239 pp., 146 illustrations.

THE author's object in writing this work has been to provide for the student a practical guide to elementary physics and chemistry as an introduction to the study of "Domestic Science." In doing this he has supplied the information required by Section I. of the Elementary Hygiene Syllabus of the Board of Education. The work is divided into forty-one short chapters, and deals with the measurement of length and area, volume, mass, and density, with thermometers and the effects and modes of transmission of heat, with the composition of the air and the elementary principles of ventilation, with elementary chemistry, with coal gas and its uses, with water and some of the substances commonly held in solution by it, with the chemistry of the human body, with food stuffs, including their cooking and preservation, with soap, soda, starch, and other common household requisites, and with disinfectants. The author must be congratulated on having furnished an interesting introduction to this formidable array of subjects. Simple experiments are described, by means of which the student can verify the statements made, and a brief summary of the contents is appended to each chapter. The author writes clearly and to the point, and arranges his matter methodically, and the student will find the book an excellent primer on an interesting and useful subject.

Every Man's Own Lawyer. 39th edition. By A BARRISTER. London: Crosby Lockwood & Son. 1902.

THE most important addition to the new edition of this work is that of the Factory and Workshop Act, 1901, the summary of which will give the reader a general idea of the statutes. The book is as useful as ever, but whether the results of the case law or legislation might not be set out is a question which we think deserves the Editor's consideration. The Workmen's Compensation Act, 1897, is given in what may be termed its skeleton shape, it is practically unknown unless clothed with its flesh of decisions.

Michael and Will on the Law Relating to Gas and Water. Fifth edition. By JOHN SHIRESS WILL, K.C. London: Butterworth. 1901.

THERE is nothing new to be said of this important and valuable book, which is indispensable to practitioners who are concerned with the matters with which it deals. It is in no sense a student's book, but it has in many respects an academical as well as a practical interest, because throughout its pages—in the cases and in the statutes and in the decisions of Parliamentary Committees—is to be found a history of the subject during recent years. The practitioner, be he lawyer or surveyor, will hardly fail to find information on every subject in it. In truth, so well known is this book that a critic of this edition can do no more than announce its appearance, and congratulate the editor upon the satisfactory character of his work.

The Law Relating to Factories and Workshops as Amended and Consolidated by the Factory and Workshop Act, 1901. By WILLIAM BOUSTEAD, Barrister. London: Sweet & Maxwell, Ltd. 1901.

THIS is simply an annotated edition of the new Factory Act, with an appendix which contains some additional statutes, such as the Truck Acts, together with an excellent index. The notes have wisely been kept within moderate bounds, and the book itself is light to handle and turned out in better style than many legal handbooks; but it is published at the absurdly high price of 9s., which will prevent many persons connected with factories from purchasing. When will law publishers learn that books which, though in a sense legal works, are intended for general use should be published at a moderate price?

Practical Exercises in Magnetism and Electricity. H. E. HADLEY, B.Sc. London: Macmillan & Co. 1901.

THIS book is written for pupils in schools of science in connexion with the Board of Education, and ought to prove useful. The book is interesting, and the meaning of the author is always perfectly plain. We think that even the advanced electrician might glance through it with profit to himself, as it is simply marvellous the number of measurements that can be done with the very primitive apparatus described. The work is of distinct educational value, but there are a good many minor points open to criticism. Apparently the boys are to measure resistance without stating the temperature at which they measured it. Again, in the definition of specific resistance no mention is made of temperature. We think also that the method given of measuring the specific resistance of liquids had better be altogether omitted from future editions, as it is quite erroneous. Again, to talk about coils being "in multiple arc" instead of "in parallel" is hopelessly antiquated; and Latimer Clark, the inventor of the standard cell, had no "e" at the end of his name.

Electric Wiring and Fitting. C. V. DRYSDALE, D.Sc. London: R. T. Bush. 1901.

THIS work ought to prove useful to wiremen and others actually engaged in the electrical industry. It makes very little claim on the knowledge of the reader, and the information given is of that practical kind which is too often searched for in vain in more academic treatises. We do not always agree with the author's recommendations. We should be extremely unwilling, for example, to test the working of an ohmmeter by putting our finger on the line terminal when the 500 or 1,000 volt generator is being worked. In his appendix Dr. Drysdale reprints from the "Electrical Trades Directory" the "Rules for dealing with cases of apparent death from electric shock."

Wireless Telegraphy. By G. W. DE TUNZELMANN, B.Sc. London: The Office of *Knowledge*. 1901.

OWING to the extremely rapid manner in which wireless telegraphy is developing, it is too early yet to write a treatise on the subject. There is, however, a great need for an elementary text-book on the subject, and Mr. de Tunzelmann's work will be welcomed by the many electricians who have still very hazy notions about the practical working of this kind of telegraphy. The author is to be congratulated on having given a simple and intelligible account of Lord Kelvin's theory of a rotationally elastic ether and Dr. Larmor's still more abstruse theory of electrons. The serious student will find this book most instructive.

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Teignmouth. By BEATRIX F. CRESSWELL. 1901. *Surrey's Capital, Guildford and District.* By J. E. MORRIS. Second Edition. 1901. *Farnham and its Surroundings.* By GORDON HOME. 1900. *Dulverton and District.* By F. J. SNELL. 1901. *A Glimpse of Cranbrook.* By STANLEY MARTIN. Second Edition. 1901. ("Homeland Handbook" Series.) London: The St. Bride's Press.

THESE are handy and well-written guides to their several districts, excellently illustrated with reproductions of photographs, and by drawings by Mr. Gordon Home. All the districts chosen are attractive, the two first mentioned being, however, the richest in architectural subjects. A fine example of a richly carved seat-end is given on p. 99 of the Teignmouth guide, and one or two illustrations of the interesting little chapel at Haccombe, with its tiles, brasses, and Carew and Haccombe monuments. In the Guildford guide Compton Church is well illustrated on p. 101, with its curious chancel and early woodwork. Apart from the interest of its castle, Farnham will be found a good starting-point for exploring the picturesque valley of the upper Wey, and only a short distance away is Waverley, the first Cistercian foundation in England, where excavations have lately been carried out. The Dulverton guide will appeal to those in search of beautiful scenery; to the east, however, is the rich district of western Somerset, full of interest to the archæologist and architect. The volume on Cranbrook forms a good handbook for country walks in a district little known and full of interest.

TRADE CATALOGUES.

THE General Electric Company, of Queen Victoria-street, E.C., have sent us their electric traction telephone circular. Owing to induction troubles, the installation of telephones in feeder pillars along tramway routes is one of great difficulty, and hence, notwithstanding their great convenience, they are not widely used. By careful design of their apparatus, and by the use of twin wires twisted round one another, the General Electric Company have overcome these difficulties. The long list of places published where these telephones are in use prove that they are a great help in the working of electric tramways. All the batteries being kept at the central station, in this system, they can readily be kept in order, and it is a great convenience to have only one pair of wires, as faults can be readily located and extensions will cause no difficulty.

Messrs. Mather & Platt, Ltd., Manchester, have sent us a beautifully-illustrated catalogue of their motors for driving machinery by electricity. Photographs are given of motors driving calico-printing machines, circular saws, pumping machinery, &c. A full list of their standard sizes of steel-clad motors is given. These machines can be provided with gas-proof gauze covers, or can be totally enclosed, so that they are specially adapted for working in factories where the fire risk is "hazardous," or where there are considerable "flyings" in the air. The machines turned out by this firm are very favourably regarded by electricians.

Messrs. Mather & Platt have also sent us another catalogue of their steel-clad motors. Misunderstandings sometimes arise owing to consumers not stating definitely whether they require their motors to be air and water tight or not. It has to be remembered that when a motor has to be hermetically sealed it is very difficult to get rid of the heat unavoidably generated in the armature, and hence its output is very considerably reduced. Eleven standard sizes of motors are given, covering all powers up to 85 brake horse-power, and a considerable variety of speeds and voltages is also given. All the parts of the motors are made in stock sizes, and are interchangeable, and it is stated that any sized machine can be delivered from stock on the shortest notice. We are glad to note this evidence that considerable progress has been made in the "standardisation" of electrical plant.

THE GRISSELL MEDAL.—In our list of the Institute prize winners last week the subject of the Grissell Medal was erroneously given as "A Timber Foot Bridge." The mistake was not ours; it was so furnished to us in the Institute list, last year's subject having been given by an accidental oversight. The subject this year was "A Roof for a Picture Gallery, in Iron, Concrete, and Glass."

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. Unless otherwise stated, consent was given on conditions. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Hampstead.—The erection of buildings, with shops on the ground floor, and of buildings, with porches and bay windows, on a site bounded on the north and west sides by West-end-lane and on the east side by Honeybourne-road, Hampstead (Messrs. Boehmer & Gibbs on behalf of Mrs. E. J. Cave.—Consent.

Lewisham.—A two-story addition at the rear of 30, Burnt Ash-road, Lee, to abut upon Tauntonroad (Messrs. G. Bush & Son on behalf of Mr. A. Fish).—Consent.

Islington, North.—An iron and glass shelter at the Holloway Empire Palace, to abut upon Holloway-road and Manor-gardens, Islington (Mr. F. Matcham on behalf of Mr. O. Stoll).—Consent.

Strand. — An office building on the site of 62, 63, 64, and 65, Charing-cross (Mr. G. R. Julian on behalf of the Canadian Pacific Railway Company).—Consent.

Width of Way.

Bethnal Green, South-West.—Building, to be used as a fermenting-house, on the south side of Bath-street, Bethnal Green, at the corner of Lisbon-street, with the external walls of such building at less than the prescribed distance from the respective centres of the roadways of those streets (Messrs. W. Bradford & Son on behalf of Messrs. Mann, Crossmann, & Paulin, Limited).—Refused.

Width of Way and Lines of Frontage.

Strand.†—Building on the site of 19 and 20, Bateman-street, Soho, with the external walls of such building at less than the prescribed distance from the respective centres of the roadways of Bateman-street and Bateman's-buildings (Mr. H. A. Woodington on behalf of Mr. B. H. Lynch).—Consent.

Formation of Streets.

Lewisham.—New street for carriage traffic, to lead from Perry-vale to Trilby-road, Forest Hill, and in connexion therewith the widening of a portion of Perry-vale (Mr. D. G. Horlock).—Consent.

Islington, South.—New street for carriage traffic in continuation of Pleasant-place, Essex-road, Islington (Mr. R. Nevill).—Refused.

Width of Way, Space at Rear, and Height of Buildings.

Islington, South.—Five houses on the west side of a proposed new street in continuation of Pleasant-place, Essex-road, Islington, with the external walls of such houses at less than the prescribed distance from the centre of the roadway of the proposed street, the buildings to exceed in height the width of such street, and a portion of the buildings to extend above the diagonal line (Mr. R. Nevill).—Refused.

*** *The recommendations marked † are contrary to the views of the local authorities.*

STAIRCASES IN PUBLIC BUILDINGS.

ROWTON HOUSES, LTD., *v.* CROW.

ON Monday last, January 27, the Tribunal of Appeal gave their decision in this matter, which had been heard by them on Tuesday, January 21.

The facts of the case, which were set forth in our report of the proceedings last week (see page 92), were briefly these :—

In the Rowton House, Fieldgate-street, Whitechapel—now approaching completion and designed to accommodate 800 men—there are three open well staircases, the steps of which are made in moulds, with coke breeze and cement in the proportion of 3 to 1, the upper surface, forming the tread and nosing of the steps, about 2 in. thick, being formed of granite chippings and cement in the proportion of 2 to 1. Embedded in the breeze concrete are two 1½-in. by 1½-in. angle irons. The landings are of similar materials, but have 3-in. by 3-in. steel joists embedded in them in lieu of angle iron. The steps are spandrel in section, with square ends pinned 9 in. into the walls. The width of the stairs is 4 ft. 6 in. Each step is rebated to the one below and jointed in cement, and the outer ends of the steps are unsupported

The District Surveyor, Mr. Arthur Crow, F.R.I.B.A, raised an objection to this form of construction at the time the plans were submitted to him some two years ago, and in the absence of any suggestion from the company's architect, Mr. Harry B. Measures, F.R.I.B.A., for strengthening the staircase, he served a notice on the company requiring them, under the powers vested in him by Section 78 of the London Building Act, 1894, the building coming within the definition of a "public building," "to provide steel strings under the unsupported ends of the stairs throughout the building" in accordance with his repeated written request. From this requisition the company appealed to the Tribunal of Appeal on the ground that "the method of construction adopted was adequate in every respect for the purposes intended."

In support of this contention evidence was given by Mr. Measures, the architect, and by Mr. G. J. Earle, the company's building manager.

In order to test the strength of the staircases one of the flights, containing ten steps, had been loaded with 2,000 glazed bricks, weighing 8 lbs each, giving a total load of nearly 7½ tons, or over 14 cwts. per step, which, together with the weight of the steps (nearly 2 cwts. each), was equivalent to a dead load of 16 cwts. per step. Upon examination of the flight after some forty-eight hours it was found that the plaster soffit was breaking away at the point where the upper step abutted upon the landing, and that the joint between the step and the landing had opened throughout nearly its entire length. So far as could be seen there was no fracture in either the steps or the landing, and, with the exception of the damage to the plaster soffit and the open joint, the flight appeared to be sound. No steps, however, had been taken to ascertain the extent of the deflection which had taken place. It was stated that the flight was shored up during the process of loading, and, with the exception of about half an hour whilst a photograph was being taken, the shoring was left in position, but with the wedges either loose or just hand-tight.

Mr. Crow, in his evidence, dealt with the evils which were likely to arise from the employment of two different mixtures of concrete in the same step. The greater density of the granite, coupled with the larger proportion of cement used in forming the tread of the step, would be likely to cause a greater expansion than would take place with the breeze concrete forming the body of the step, and a want of complete homogeneity would ensue. This evil was accentuated by the close proximity of the upper flange of the angle irons to the line of junction of the two different kinds of concrete, and further by the greater expansion and contraction which would take place in the iron, due to variations in temperature. After deprecating the use of coke breeze as an aggregate for concrete when required to withstand a severe transverse strain, Mr. Crow went into his calculations of the load which in time of panic the steps might have to carry. He allowed three men to each step, and assumed the average weight of each man to be 11 stone. This gave 4¼ cwts. As, however, the mass would be in motion, the load must be doubled to obtain the equivalent live load, making 8½ cwts., which, together with the weight of the step (2 cwts.), would give a total of 10½ cwts. for each step. He then dealt with the question of the factor of safety, and suggested that, with such uncertain conditions as existed in a step composed of the various materials described, the factor of safety should not be less than five or six, which would give at least 50 cwts. as the breaking load for which each step should be calculated. He drew attention to the fact that the test actually applied did not nearly approach this figure, being in fact little more than half as much again as the load which might be placed upon the steps in time of panic. He suggested that the deflection which had taken place under the test, as shown by the cracking or opening of the joint, indicated that a sufficient margin of stability had not been allowed. The provision of steel strings would convert each step from a cantilever into a small girder and thus materially increase its strength.

After a very careful inspection of the staircases by the members of the Tribunal (Messrs. Penfold, Hudson, and Gruning), particular attention being paid to the flight of steps which had been subjected to the test described, Mr. Penfold stated that the Tribunal had with considerable regret come to the unanimous conclusion that the staircases were faulty in construction. They were reluctant to come to this decision on account of the general excellence of the work shown in the rest of the building. They directed that further steel joists be placed under each of the main landings, and that bent steel strings be carried from thence under each flight of steps and under the quarter-space landings, and the ends pinned into the external walls. The details of the steelwork would be subject to the approval of the District Surveyor, with leave to the company to apply in case of a further difference arising.

Mr. Hudson expressed his opinion that the margin of safety allowed in the present case was not nearly sufficient, and pointed out that considerable allowance should be made for the uncertain action of Portland cement. Even when the greatest care had been exercised in the manufacture, and proper precautions taken for cooling, the carelessness of a workman in mixing the cement might cause serious latent defects.

Mr. Gruning strongly condemned the system of using coke breeze for the body of the step, with a facing of granite chippings and cement. Concrete steps should be absolutely homogeneous, and in this respect he looked upon an iron core as a source of weakness rather than strength, the oxidation and expansion of the metal tending to cause disruption of the materials. He would prefer steel wires embedded in the concrete.

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Correspondence.

SOME SUGGESTIONS AS TO COMPETITIONS.

SIR,—Will you afford me space for a few observations upon competition designs, and some suggestions for relieving the strain of their cost to competitors?

In spite of a rather general reprobation of the system, it admittedly possesses advantages, especially to the younger members of the profession. In any case it will endure, and we have to make the best of it. Of the several objections which can be raised to it, there is no doubt that the one which is most felt is the great, and as I think unnecessary, expense, constituting a serious tax on a profession which, taken as a whole, is far from being overpaid. Surely the first and most enduring impression after a survey, however casual, of the designs in an average competition is that of wasted effort and expense. A rough calculation invariably shows that the total cost of the designs nearly equals, if it does not exceed, the commission which will be earned by the successful competitor alone. To no one is this more obvious than to an assessor, whose duties compel him to examine the drawings carefully. The pity of it is that by far the largest part of the expense is absolutely unnecessary, and far from enhancing the competitor's chances.

Much of the elaboration of drawings is no doubt due to a desire to impress the assessor or promoters. Yet a little consideration should show us that the very extent of an assessor's work imposes limits upon the amount of detail to which he can give attention. Often, indeed, the main effect of elaboration is to confuse the broad features and lines of the plan, which claim his notice more than small matters of detail. Generally speaking, the cleverest designs are more often than not the simplest and least elaborate. The genius of architects shows itself in their true perception of what are essential and what unessential features, and a realisation of the fact that detail should be kept quite subordinate to general arrangement. Add to these matters a wise selection of colours calculated to catch the eye, yet so harmonised or contrasted as (without offending taste) to focus attention upon the principal features of the scheme.

Unless the conditions of competition ask for them, it is quite unnecessary to show drainage, gas and water pipes and fittings, details of roof and floor construction, always provided that there is nothing out of the ordinary intended.

It tends to keep the plans clearer if the names of the rooms are printed in the centre, and with sufficient boldness to stand out from detail information. Dimensions of rooms should be figured just below the names of rooms.

If colours are not particularly specified in the conditions, it is effective to employ two only on the plans, one to indicate rooms and the other passages, staircases, and other means of communication. Elevations should be coloured in flat washes to indicate materials, but are best left unshaded, or if shaded at all, only with broad washes. A "faked" elevation is dishonest and does not help a competitor. Sections should be coloured with a flat wash.

In mounting drawings it is well to have a dark border, which has a tendency to confine the gaze within its borders; a small matter, but not to be despised.

In short, everything that can be done to assist the assessor in grasping easily and quickly the broad lines and best features of the design is a point in favour of the competitor. Everything that obscures essentials discredits the whole. It should be added, however, that attempts to deceive or mislead are, or should be, fatal.

A set of drawings prepared on these lines should cost comparatively little for draughtsmanship. Any cost a competitor is put to in looking up his subject, or even in planning the building, is not thrown away. Indeed, it is well invested, and has gone to increase his general knowledge. ASSESSOR.

THE ARCHITECT'S USE OF ENAMELLED TILES.

SIR,—In your Note on the architect's use of enamelled tiles, you urge that "colour, and the desire for it, go with regions of strong sunshine," and rather wonder why it should be so, and why those who live in a dull atmosphere do not try to make their buildings bright with colour. But may not the facts of the case bear another interpretation? It is true that the dwellers in hot countries—India, Persia, Syria, Africa, and Spain—have surrounded themselves with masses of strong colour in a way that the dwellers in less glaring lands have not done; or rather, where they use colour, they lay it on with greater freedom and brilliancy; but the reason, I think, is this. These countries, except for the short period of spring, are countries in themselves without colour. The sky is too blinding to be gazed at, what vegetation there is gets withered up or dust covered, the world is a grey world, hot, dry, and colourless. But the hunger and thirst for colour is universal. So by means of carefully-tended gardens, running water, tiled wall surfaces, and beautiful hangings, the parched inhabitants of these arid countries endeavour to reproduce, in their immediate surroundings, that wealth of colour that is universal with us outside our towns.

That their scale in colouring should be different to ours, follows out of the nature of their circumstances. In our country we are never without colour, and the seasons are busied in providing us with a chain of fresh glories, melting into and blending with each other by incessant and subtle gradations. In the East, man (except for brief seasons) has to make his colour. Outside our towns and our ruined suburbs an architect has no occasion to use (externally) coloured materials other than what the site itself affords. But in our towns the case is different. There we have constructed a blank colourlessness, which our trees and parks and gardens can only mitigate in part; and they are at this disadvantage, that, thanks to the atmosphere which we have compounded, they can neither breathe properly nor keep themselves clean, and the season of vegetation is curtailed by the corrosion of our air. It is in the streets then, of our manufacturing towns such as London, Leeds, Manchester, and so on, that an external treatment in colour would seem to be called for, and to enable this colour to be permanent and successful, it would have to be in such materials as enamelled tiles and glazed terra-cotta. Nor would the reflections from such surfaces be of so much consequence as seems to be anticipated. Already about one-third of a house front has a glazed surface, by its windows, and these are kept clean and polished far more often than the rest of the front would be, were it plated in tiles. And yet the sheen from the windows is rarely a discomfort, and often a comfortable and interesting effect. There is a corner house in Oxford-street, near Soho-square, that is covered in tiles, and I have never been fortunate enough to get a sunset to make a conflagration upon it, though I have seen its windows lit up. HALSEY RICARDO.

BUILDING CONTRACTS.

SIR,—I was much interested in the Note in last week's issue, on "building contracts"; but there is one point upon which I should be glad to have some further information.

In the course of his judgment the Master of the Rolls said in effect (if I read the matter aright), that a builder, when dealing with P.C. sums and ordering goods to be paid by them, acted as agent of the owner, and that he was not personally liable unless he distinctly stated that he, and not the building owner, was the principal in the transaction.

Now, I should have thought that the converse of this would have been true:—*i.e.*, the builder when ordering goods would have been personally liable, unless he distinctly stated that he was acting as agent only and disclosed the name and address of his principals. For you remember that not long since a firm of architects was let in for a large amount through ordering goods on behalf of a client, but without definitely stating that they were agents and not principals. This view is not unreasonable, I think, when one bears in mind that builders are dealing with large sums of money, generally as principals and seldom as agents, and that architects dealings with large sums of money are always as agents.

I had thought that at last I knew the legal position of P.C. amounts, but after this judgment of the Master of the Rolls I am getting confused again.

Can any of your readers help me? K. L.

[*** We are inclined to think that our correspondent is taking a broader view of the dictum of the Master of the Rolls than the judgment or our commentary on it warrants. The builder is agent only in respect of the goods specially exempted from the general range of the contract. The judgment should be read *in extenso*.]—ED.

THE SANITARY INSTITUTE.—The annual congress of the Sanitary Institute will be held at Manchester, September 9-13. President: The Right Hon. the Earl Egerton of Tatton, Section I., "Sanitary Science and Preventive Medicine," will be presided over by Sir J. Crichton Browne, M.D.; Section II., "Engineering and Architecture," by Sir Alexander Binnie; Section III., "Physics, Chemistry, and Biology," by Professor A. Sheridan Delépine. Eight technical conferences will also be held in connexion with the congress.

The Student's Column.

PART II.—DRAINAGE.

CHAPTER 5.—SEWAGE—THE NATURE OF SEWAGE.

SEWAGE may be defined as a foul liquid. It consists of water and solid matters of various kinds (in solution and in suspension). The principal sources of pollution are the waste products of animals (including man), the domestic operations of cooking and washing, trade processes, the mud and filth of streets and yards, and refuse of various kinds, such as paper, rags, and straw. In addition to what may be called service-water, sewage contains always some proportion of rain-water and usually of subsoil-water.

The composition of sewage varies in different towns and districts, chiefly in consequence of the difference in the staple industries. The impurities in domestic sewage are, however, fairly constant, but diluted in different degrees according to the amount of service-water used, the rainfall, and the quantity of subsoil-water admitted to the drains. The presence or absence of water-closets makes very little difference in the composition of sewage.

The odour of fresh sewage is scarcely perceptible. It is only when decomposition takes place that the odour becomes objectionable. The chemical composition of sewage and the nature of the changes which it undergoes before its final purification, will be more conveniently considered in Part iii. Suffice it to say here that the object of all drainage ought to be to convey foul liquids to the sewers as quickly and thoroughly as possible, so that they will neither escape from the drains, nor have time to decompose during their passage through them. Changes will, however, occur in their passage through long sewers, and objectionable gases will be evolved. To prevent these gases finding their way into drains, intercepting traps must be placed in the drains as near the points of connexion with the sewers as possible.

In addition to inorganic impurities, sewage contains minute vegetable organisms collectively known as micro-organisms or bacteria. These may be beneficent in their action, facilitating the final purification of the sewage, or they may be of a dangerous character, known as pathogenic or disease-producing. The disease-germs most commonly present in sewage are those contained in the evacuations of animals and man, and if water or food contaminated with them is taken into the human system, specific diseases may be caused. It is therefore necessary that drains and sewers should be watertight, so that water-supplies will not be contaminated.

Sewage-Polluted Air.—It has been found by observation that the air of sewers contains fewer bacteria than the air of inhabited buildings or of streets, but sewage-polluted air may nevertheless be very harmful. Sore throats, diphtheria, diarrhœa, typhoid fever, and other diseases, have been attributed to it, but the exact relation between foul air and disease is yet obscure.

There are fashions in medicine as in dress, and at one time it was considered that air polluted with the emanation from sewage had a direct poisonous effect on those breathing it. To some extent this is true; unventilated sewers may contain a proportion of carbonic acid and other gases sufficient to overpower any person entering them. At another time it was held that the germs in sewer-air were the principal cause of the diseases attributed to it. This is a theory difficult to prove, but may also be accepted as at least partly true. It must not be forgotten that foul air may have a twofold action—it may be inhaled and so affect the throat and lungs, or it may pollute water, milk, and other foods, and so affect the digestive organs. A less positive theory is that sewage-polluted air lowers the vitality of persons breathing it or partaking of foods which have been subject to its influence, and thus renders such persons more susceptible to certain diseases.

Whatever theory the architect may accept does not very much matter. The main fact to be borne in mind is that emanations from sewage—especially stale sewage—are harmful, and this fact must have its due influence on the design of drainage systems, and particularly on the location of the inlets and outlets provided for ventilation, and on the construction of drains in or under buildings.

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The Quantity of Sewage.—Three principal factors must, as a rule, be considered in determining the quantity of sewage likely to be discharged from a given domestic building and its appurtenances—(1) the water-supply (its nature and quantity); (2) the rainfall (its maximum intensity and the proportion which will probably find its way to the drains); and (3) the subsoil-water (if this is allowed to enter the drains).

1. *Water Supply*.—The quantity of water used for all domestic purposes varies according to the ease with which the water can be obtained, and the class of house. In rural districts where the water has to be carried in "long tins" (perhaps for hundreds of yards), the cottager will probably be content with a supply of 2 or 3 gallons per day for each member of his household. The labour of pumping water also, in many cases, restricts the quantity used. In towns, the daily water supply in this country averages about 25 or 30 gallons per head, but this includes the daily proportion per head of the water used for street watering, trade processes, public baths, &c. In some towns the daily supply exceeds 100 gallons per head. These figures are of little use as a guide to the quantity of sewage produced in domestic buildings.

According to Parkes, 12 gallons per person may be regarded as a fair allowance for middle-class households, not including plunge-baths and water-closets. The amount is made up as follows :—

	Gallons daily per person.
Cooking	·75
Fluids as drink (water, tea, coffee)	·33
Ablution, including sponge-bath of 2½ to 3 gallons	5
Share of utensil and house-washing	3
Share of clothes (laundry) washing (estimated)	3
Total (say).....	12 gallons.

The quantity of water required for water-closets varies according to the usage of the closets and the capacity of the flushing cisterns. The latter may deliver from 1½ to 2½ or 3 gallons at each flush, and as modern closets serve frequently as urinals and slop-hoppers, there are probably three or four flushes per person daily—that is to say, on the average from 6 to 8 gallons.

The quantity required for baths can only be roughly estimated. In many houses the daily plunge may be enjoyed by nearly every member of the family, while in others it is almost unknown. If the water-supply is limited, the bather economises by using a smaller quantity of water for each bath. A common allowance is thirty gallons for each adult bath, but the quantity may range from about twenty to fifty or sixty gallons. For poor-law schools the calculation must be based on two baths weekly per child, but the quantity of water required will depend very largely upon the type of bath in use. A skeleton spray-bath requires much less water than an ordinary plunge.

Allowing 10 gallons daily per person for water-closets and baths in middle-class houses, and the same quantity for drinking, ablution (exclusive of baths), kitchen and laundry requirements, and house-cleaning, we obtain a daily total of 20 gallons per person. To this the quantity required for daily plunges must be added. If we have a middle-class household of eight persons, and allow for two daily plunges, the total quantity of sewage may be roughly estimated to be (20 gallons × 8) + (30 gallons × 2) = 220 gallons. A 3-in. drain-pipe with a fall of 1 in 30 would, if running full, discharge this quantity in less than five minutes. Obviously the *quantity* of the sewage proper does not necessitate large drain-pipes.

The *daily* flow is, however, of little use as a guide to the size and inclination of the drains. During certain hours of the day, the volume of sewage produced is much larger than at other times, and calculations for *sewers* are generally made on the basis of half the daily flow being passed into the sewers in six hours. In isolated buildings, however, no average of this kind is of the slightest use. The maximum flow must be considered, and this will occur (as far as the sewage proper is concerned) on the simultaneous discharge of the waste water from a number of sanitary fittings—say a bath, water-closet and sink. Even in this case the maximum flow will probably not exceed 1½ gallons per second.

The flow of sewage from stables is generally estimated to be from fifteen to twenty gallons daily per horse, but this quantity will often be exceeded when two or more carriages are in use. Ten gallons per head daily are usually allowed for cows.

II. *Rainfall*.—The rainfall varies widely in different parts of the country, and also in different parts of the same district. Speaking broadly, the mountainous portions of Argyle and Inverness (including the Isle of Skye), in the west of Scotland, the greater part of the English Lake District, the mountains of north and south-east Wales, and the mountains of West Galway, have an annual rainfall exceeding 80 in.; the remaining westerly portions of the British Isles, with the exception of the principal estuaries and some sheltered places, have an annual rainfall of 40 in. and upwards; the rainfall in the easterly portions of the islands is less; in the south-east portion of England, from the Humber to the Thames, excluding the higher grounds in Lincoln and Norfolk, it is only about 22 in. or 25 in. per annum.

In the preparation of sewerage schemes a knowledge of the local annual rainfall is absolutely necessary, and in the case of isolated buildings, it is also desirable. It is still more important, however, to ascertain the greatest intensity of rainfall. This varies, of course, in different localities, and occasionally amounts to upwards of half an inch in five minutes. This rate, however, is not maintained for many minutes. One of the heaviest rainfalls yet recorded in Great Britain occurred at Lednathie, in Forfarshire, during a thunderstorm in June, 1887; no less than 2·24 in. fell in forty minutes. On October 3, 1890, 7¼ in. of rain fell at the Ben Nevis Observatory during the twenty-four hours.

Calculations based on a maximum intensity of 1 in. in a quarter of an hour may be regarded as sufficiently safe for all practical purposes. The amount of rain falling on a surface of 100 sq. ft. will be (at this rate) 8½ cub. ft. in a quarter of an hour, or very nearly 3½ gals. per minute.

Some portion of the rainfall is, of course, absorbed by the surfaces on which it falls, but in the case of roofs and paved or asphalted yards or roads, the amount absorbed is two small to be taken into consideration. Gravel paths and macadamised roads admit of a certain amount of percolation, and a reduction of about 25 per cent. may be made in respect such surfaces.

3. *Subsoil Water*.—The amount of subsoil water in a given piece of ground can only be ascertained by actual test, and this point need not, therefore, be elaborated. As a general rule, it is best to exclude subsoil water from the sewage-drains.

GENERAL BUILDING NEWS.

CHAPEL, CHYANGWHEAL, NEAR ST. IVES, CORNWALL.—At Chyangwheal, near St. Ives, a new chapel in connexion with the New Connexion Society was opened on the 13th ult. The building was designed by Mr. Hill, architect, of Redruth, and was erected by Mr. R. H. Pearce, builder, of Chyangwheal.

PARISH CHURCH, LOFTUS, YORKSHIRE.—On the 21st ult., the Lord Bishop of Beverley visited Loftus and consecrated the new chancel and rededicated the parish Church of St. Leonard. On the foundation of a still older church, the one now reconstructed was erected at the beginning of last century, and comprised a simple oblong building, with a flat plastered ceiling and a small recess at the east end for the altar. A new chancel, 33 ft. long has been added, with organ-chamber, choir and clergy vestries, and heating-chamber. The old roof has been removed, the walls raised, a stone arcade erected forming a nave and north aisle, and the length increased. A new clearstory, with traceried windows, has been formed, and new windows and buttresses put to the aisle walls. A low west tower and porch and the west gable are yet to be completed, as funds permit. In the new completed building there is no chancel arch. The open panelled timber roof, which rises from heavy moulded cornices on each wall, is continuous from west end to east, the chancel gable being completed by a large traceried window of ornamental design. New open seats have been put in, and oak chancel fittings and pulpit. The walls are panelled round with a high wooden dado. The floors are of solid wood blocks laid on concrete. The works, which have cost about 3,000*l*., have been carried out by Messrs. Bastiman Bros., contractors, of Middlesbrough, from the designs and under the superintendence of Messrs. Clark & Moscrop, architects, of Darlington.

MISSION CHURCH, TIVERTON.—The memorial stone has just been laid of a mission church in the district of Elmore, in St. Peter's parish, Tiverton The building, which has been designed by Mr. W. E Williams, will consist of nave, transept, chancel, schoolroom, and porch in the late Gothic style. It is to be 50 ft. long by 20 ft. wide, and will be built of Pinhoe bricks, with red rubber arches, Bere stone windows, and Brosley tiled roof, with Boyle's turret ventilator. The chancel will be separable from the main building with curtains, and the nave can then be used for meetings, concerts, &c. There will be accommodation for about 180 persons. The work is being carried on by Messrs. R. Grater & Sons, under the architect's supervision.

SCHOOL, MANSELTON, SWANSEA.—The new Manselton Board School was opened a few days ago. The architect of the building was Mr. Lawrence, and the schools have been erected at a cost of some 23,500*l*. The accommodation provides for 1,200 (400 each department).

BETHNAL GREEN WORKHOUSE.—The Bethnal Green Board of Guardians have resolved to remodel their workhouse in Waterloo-road, E. This will necessitate among other work the provision of a site for new casual wards, alteration and enlargement of dining hall and the reflooring and reseating of same, the provision of new kitchens and store-rooms, the erection of a new wing for 100 female inmates, also new bath and lavatory buildings and modern padded rooms. Mr. W. A. Finch is the architect.

DRILL HALL, DURHAM.—A new drill hall, with recreation-rooms and the necessary accompaniments for a Volunteer depot, has been erected in Durham City, the headquarters of the 4th V.B. Durham Light Infantry. The new hall is erected on the site of the old Co-operative Soap Works, where space, giving a frontage of 72 ft. to the street, and extending back for 300 ft., has been secured. The front elevation is of clean chiselled stone, and a corridor, 12 ft. wide and 72 ft. long, leads to the hall, an apartment 104 ft. long and 51 ft. wide. The front of the buildings is devoted to the sergeant-major's quarters and the necessary clerical offices, whilst in the rear are the sergeants' messroom and an armoury where 500 rifles can be accommodated. Upstairs, on the first floor, are the officers' messrooms and a gymnasium. The whole has been fitted up with the electric light, and the drill hall has been so arranged that the building may be used for banquets, entertainments, and general public gatherings. The architects for the hall were Messrs. Oswald & Son, of Newcastle, and the contractors Messrs. Kell & Son, of Durham.

PUBLIC HALL, ALFORD, ABERDEEN.—The foundation stone has just been laid of the new Alford Public Hall. The plans of Mr. G. F. Milne, architect, Aberdeen, were accepted. The building, which will be 87 ft. in length and 43 ft. in breadth, embraces two halls, the larger of which is seated for 500 persons, and the smaller for 100. There are also the necessary ante-rooms, lavatory accommodation, and a kitchen fitted with the necessary appliances. The building will be ventilated by Boyle's system. The walls are of Sylavathie granite.

NEW BUILDINGS IN ABERDEEN.—The Plans Committee of the Town Council have sanctioned the plans of the following new buildings :—Shed on the east side of Old Ford-road for C. F. Paton & Co., Ltd., per Messrs. Cameron & Watt, architects; dwelling-house on the north side of Ashgrove-road for Mr. Arthur Taylor, sculptor, per Mr. R. C. Garden, architect; two dwelling-houses on the west side of Forest-avenue for Mr. James Scott, house proprietor, per Mr. Harvey Mennie, architect; alterations in connexion with premises, No. 13, John-street, for Messrs. James Wilson & Son, grain merchants, per Messrs. W. Henderson & Son, architects; alterations and addition in connexion with mission-hall, on the east side of Correction Wynd, for the managers of the West United Free Church, per Mr. George B. Mitchell, architect; six dwelling-houses on the north-east side of Duthie-terrace for Mr. Benjamin Gill, West Cults, per Messrs. Sutherland & Pirie, architects.

THE NEW MUSEUM, CARDIFF.—A special meeting of the Cardiff Museum and Art Gallery Committee was held on the 17th ult., to inspect the plans submitted by Mr. Edwin Seward, F.R.I.B.A. The plans were accompanied by a Report, in which the architect stated that he had visited various museums in England and on the Continent in order to gain information as to what was needful. A detailed discussion took place, the Committee approving generally of the plans, and it was resolved to supply each member with a lithographed copy for further consideration. The cost of the portion of the buildings covered by the plans is roughly estimated at 30,000*l*.

ST. ANDREW-BY-THE-WARDROBE, QUEEN VICTORIA-STREET.—The alterations in connexion with the churchyard at this church, which is situated next to the Bible Society in Queen Victoria-street, have now been completed. In place of the high and ugly blank wall, new wrought-iron railings and stone piers with carved vases have been erected. The wrought-iron gates are given by Mrs. Banister Fletcher in memory of her late husband, who was churchwarden. The churchyard has been laid out in terraces and covered with turf, exposing one of the best samples of Wren's churches to public view, and adding another green spot in London. The work has been designed and carried out under the superintendence of the architects, Messrs. Banister Fletcher & Sons. The keys, if

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required, are to be obtained from Mr. Thomas J. Whiffen, 30 and 31, St. Andrew's-hill, Queen Victoria-street.

PROPOSED NEW FIRE STATION, BRIGHTON.—On the 24th ult., Major C. E. Norton, R.E., Local Government Board Inspector, held an inquiry at the Town Hall, Brighton, concerning the application of the Corporation for sanction to borrow 10,050*l.* for the purchase of land for street improvements, 4,472*l.* for the erection of a fire station, and for consent to the appropriation of a part of the Pavilion Estate as a site for the same. Among those present were Mr. F. J. C. May (Borough Surveyor), and Fire Superintendent Lacroix.

FOREIGN.

INDIA.—The Rangoon Municipal Commissioners have adopted the Hlawga scheme of water supply to the city in preference to the Thamaing Lake scheme.——The military authorities of Quetta are about to adopt the electric light for the military and civil station, the railway station, workshops, and quarters.——A Victoria Memorial Hall is about to be erected in Calcutta, presumably on the Maidan, and near the middle of Esplanade-row East; trial pits to ascertain the nature of the soil have been made.——The land formerly occupied by the lunatic asylum at Lahore has now been reclaimed, and the railway administration is building quarters on it for traffic menials, at an estimated cost of 21,176 rupees.——The historic Hastings House in Calcutta is undergoing complete restoration, with a view to its being occupied from time to time by native princes and noblemen who may be invited as imperial guests.——House building is very brisk in Calcutta at present, and the demand for houses so much exceeds the supply, that many well-to-do natives are invading the European quarter.——A magnetic observatory is about to be erected at Kodaikanal at an estimated cost of 15,000 rupees; the work is sanctioned and classified as an "Imperial civil building."——Several historical pictures in the Calcutta Town Hall have been renovated by Mr. Scott, an artist visitor to the city, and the residents have thanked the Corporation for the measures taken to clean and revive the pictures, whereby the public interest in them is much enhanced.——A bridge is about to be built over the Ganges at Allahabad in connexion with the new railway line.——An extension of the Gwalior railway from that city to Jabalgarh has been sanctioned.

GERMANY.—The German Emperor unveiled a stained-glass window, designed by Professor Ernst Ewald, in the Museum of Industrial Art in Berlin on January 25. The window represented the late Emperor and Empress Frederick with clasped hands, the Emperor in mediæval armour and the Empress in a costume of the period. The window is placed on the great staircase of the museum. The Emperor subsequently delivered an address on art, when he urged his subjects to cultivate "a definite conception of the beautiful, and to adapt it to their needs in life."

AUSTRIA-HUNGARY.—A large Roman Catholic parish church is to be erected in Vienna, and competitions have been invited by the Ministry of Culture. The first prize is 1,000 kroner, and the designs are to be sent in by the 15th inst.——The same body invites designs for a reliquary, and two prizes of 500 and 300 kroner are offered to sculptors, the designs to be sent in by the 15th inst.——The Municipal Building Department of Buda-Pesth contemplate erecting a public monument to Kossuth, and invite designs from architects and sculptors. The prizes offered are 6,000, 4,000, and 3,000 kroner for the first three in order of merit respectively, and the designs must be submitted by the 28th inst.

MISCELLANEOUS.

SELBY ABBEY CHURCH.—The central tower of Selby Abbey Church is in a ruinous condition, and on the 21st ult. a meeting of the inhabitants was held in the public rooms for the purpose of considering the condition of the tower and the means that should be taken to remedy it. The Bishop of Beverley said that if the present state of the tower was causing a certain amount of disappointment after the great work of restoration that was carried out, it must be met with courage and practical wisdom.—The Vicar of Selby explained the present condition of the tower, due, as he showed, to the treacherous character of the foundations, which consisted of cobbles thrown down on sand. In 1690, he said, the tower fell. Why, no one knew, but its foundations had probably been weakened by the removal of many buildings which formerly acted as supports, and possibly by the long-continued dry weather. At that time an appeal throughout the country was made. Experts who had made an examination agreed as to the great danger there was from the upper part of the tower. The signs of distress previously observable had extended, new cracks had presented themselves, and the upper part was now very much worse than when the last official examination was made. It was not for the sake of the tower itself that the subject needed attention. The tower was a comparatively modern structure, but the nave and choir, in which the glory of the Abbey Church rested, was in imminent danger if any collapse took place. Concluding, the Vicar recommended that in the first place the tower should be made safe. The upper part would in any case have to be taken down first, and then a scheme for rebuilding it could be taken in hand. Lieut.-Col. Hawdon moved a resolution expressing the opinion that the tower "demanded immediate attention, with a view to ensuring its safety." Mr. Mark Scott seconded the resolution, and it was unanimously agreed to. On the motion of Mr. E. Townend, seconded by Mr. J. Connell, a committee was appointed to take such steps as might be necessary for securing the safety of the tower.

INDUSTRIAL ARBITRATION IN AUSTRALIA.—New South Wales is closely following New Zealand in the attempt to substitute a compulsory system of arbitration in place of strikes and lock-outs, and thus assist in preventing a repetition of the disastrous conflicts between employers and employed which have been so frequently, as in other countries, productive of injury to the mutual interests of capital and labour. In framing the Act several improvements, suggested by the working of the law in New Zealand, have been made. In New Zealand any seven persons can form an industrial union, but in New South Wales only a registered trades union can do so. The reason for the change is that the privilege given in New Zealand was abused, and has been sometimes used by traders to arouse disputes in the employment of trade rivals. Moreover, it is enacted that no industrial dispute can be referred to the Court of Arbitration save by a registered trades union or by the official Registrar, and it is also imperative that the opinion of a majority of the members of the trade shall be taken in a manner prescribed. This is for precautionary purposes, so that there shall be no hasty or ill-considered entrance into a dispute. Again, there are no boards of conciliation, as in New Zealand. This means that there will be no preliminary investigations, the dispute being taken straight into court, thereby preventing delay and decreasing expense. Another and most important innovation consists in making it a misdemeanour by employees to strike, or by employers to lock out, either before a reference or during its progress. There is to be no cessation of industrial operations pending the settlement of the dispute. It is stated that this is the first instance of an attempt being made in any Legislature to treat a quarrel between a master and his workmen as a public nuisance which ought to be prohibited.

MARKET VALUE OF BUILDING SITES IN LONDON.—The freehold site (to which we recently adverted) adjoining that of the Olde Bell tavern in Fleet-street, with return frontages to St. Bride's-avenue and Bride-lane, and covering an area of 550 ft. superficial, was sold at the Mart on January 22 by Messrs. Douglas Young & Co., on behalf of the Corporation of London, for 10,150*l.*, that is, at a rate of nearly 18*l.* 10s. per square foot; in April last the site of the tavern itself realised at auction a price of 7,500*l.*, equal to about 6*l* per square foot. Under direction of the Ecclesiastical Commissioners, the sale at auction of the site of the Church of St. Bartholomew, Little Moorfields, was effected on January 21 by Mr. Tewson, of Messrs. Debenham, Tewson, Farmer, & Bridgewater, at a bidding, on behalf of a building syndicate, of 20,400*l.* The site, extending over 6,300 ft. superficial, has a total frontage of 270 ft. to Moor-lane, Tenter-street, and New Union-street.

WORKING-CLASS DWELLINGS, ST. PANCRAS.—The Local Government Board have made an order sanctioning two schemes prepared by the Borough Council of St. Pancras in respect of the Brantome-place and Prospect-terrace areas and the Great College-street site, for the erection of dwellings to accommodate respectively 430, 144, and 322 persons of the working class. The Board, however, require that, whilst one-half of the Brantome-place area shall be cleared as soon as may be, so as to provide for 215 persons, no buildings now occupied as dwelling-houses on the other half shall be demolished until that accommodation shall have been duly supplied; they enforce a similar condition as regards the Prospect-terrace area; the dwellings upon the Great College-street site are to be built by the local authority within two years from December 7 last.

ABERDEEN MASTER PAINTERS' ASSOCIATION.—The annual meeting of the Aberdeen Master Painters' Association was held in the office of the Secretary, Mr. J. B. Davidson, Union-street, on the 20th ult., when the office-bearers were elected as follows:—President, Mr. Alexander Latto, Vice-president, Mr. William Philip; Secretary and Treasurer, Mr. J. B. Davidson; committee, Messrs. Henry Donald, John Mason, Edward Copland, Adam Buchan, C. R. Fraser, and J. W. Forrest. The President stated that he had attended a conference of the National Association of Master Painters, of which he is President, and the question of the travelling scholarship had been settled very satisfactorily. A statement was then submitted on the subject. The statement explained that a proposal had recently taken shape among the three national associations, England and Wales, Ireland, and Scotland, for the institution of a travelling scholarship for apprentices, with the view of enabling them to extend their theoretical and practical knowledge of decorative art. It had been proposed that the scholarship should be of the annual value of 50*l.*, and that the Association of England and Wales should contribute annually 25*l.*, Scotland 15*l.*, and Ireland 10*l.* It seemed reasonable and expedient that while the present levy of 5s. per member of affiliated associations, and 7s. 6d. per individual members should be maintained, there should also be a scheme whereby the expenses of the apprentices' competition and the contribution to the proposed scholarship should be met by a contribution from the members of the Association, or individually in proportion to the number of apprentices employed. It is estimated that 1l. per apprentice at the most would be amply sufficient. The report was adopted. With regard to the by-laws existing between the masters and employees, it was stated that no alteration would take place during the present year.

THE ASCROFT MEMORIAL, OLDHAM.—The members of the Parks and Cemeteries Committee, with representatives of the Ascroft Memorial Committee, held a meeting on the 20th ult. with a view of selecting a site in Alexandra Park, Oldham, for the erection of a statue to the memory of the late Mr. Robert Ascroft, M.P. It was resolved to place the statue on the top walk of the park. Mr. Pomeroy, of London, has been appointed the sculptor.

IMPROVEMENTS AT WINDSOR CASTLE.—Considerable improvements have been made in the sanitary arrangements of the southern part of Windsor Castle, recently occupied for a few days by the King and Queen, by the Office of Works, under the supervision of Professor Corfield, the consulting sanitary adviser. All the drains under the South Tower from Edward III.'s Tower to the Victoria Tower have been done away with, so that there is now no drain under the buildings on that side of the Castle, and new water-tight iron drains have been laid outside the building. Internal water-closets and soil-pipes have been cleared away, ventilated lobbies formed in connexion with the closets, new soil-pipes fixed outside the building, and the most improved appliances of all kinds fixed. Suitable disconnexion arrangements have been provided between the new drains of these towers and the Castle sewers, so that each of the towers is, so far as the drainage is concerned, a house within itself. Similar improvements will be gradually carried out throughout the rest of the Castle.

BRISTOL MASTER BUILDERS' ASSOCIATION.—The annual meeting of the Bristol Master Builders' Association was held at the offices of the Guildhall, the President, Mr. Walters, being in the chair. The annual report, of which the following is a summary, was presented: The work done by the Association during the past year had been of an excessive and varied character. The volume of trade was fully maintained, as anticipated in the earlier part of the year, but towards the end dwindled to an appreciable degree, without a doubt the result of the general depression in trade throughout the Kingdom, and the period now under review could not by any means be taken as a standard from a builder's standpoint. The Association had issued notices to the various operative societies of an intention to alter the rules with regard to the rate of wages and periods of notice. The reorganisation of the South-Western Federation, and the various details in connexion therewith, had occupied much time, and perhaps the most vital question was that dealing with the financial position of the federation. The importance of that matter was fully realised, and an opinion was expressed that the fairest way of arriving at the subscription was to fix it upon the basis of the amount of wages paid by each employer. Cases having come under the notice of the Association in which tenders for work were requested without the necessary quantities being supplied, it was resolved that the members of the Association should refuse to tender unless quantities were supplied for all works amounting to and over 1,000*l.* The subject of naming a time limit for the completion of contracts had been introduced to the notice of the committee, and it was considered that prompt action should be taken and a definite line laid down as to procedure. It was accordingly resolved that in tendering for work where it was requested a time limit should be named, such a request should not be complied with.—Mr. Church moved the adoption of the report, which was seconded by Mr. Humphreys, and carried.—Mr. Humphreys, Hon. Treasurer, presented the statement of accounts for the past year, and upon the proposition of Mr. Geo. Wilkins, seconded by Mr. Neale, it was approved.—The retiring President, Mr. Walters, proposed the election of Mr. George Wilkins as President for the coming year. This was seconded by Mr. Krauss, supported by Mr. George Humphreys, and carried unanimously. The newly-elected President was at once inducted into office, and presided for the remainder of the meeting.—Upon the motion of the President, seconded by Mr. Neale, a hearty vote of thanks was tendered to Mr. E. Walters for the time and attention he had devoted to the work of the Association during his year of office. Mr. Walters briefly acknowledged the compliment.—On the motion of Mr. Neale, seconded by Mr. Lovell, Mr. A. Dowling

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was unanimously elected Vice-President. Mr. George Humphreys was re-elected Hon. Treasurer, and heartily thanked for his past services in that capacity. The following gentlemen were elected members of the Committee:—Messrs. W. Church, A. Krauss (Hon. Vice-President), Neale, Walters, Ridd, Poole, Lovell, F. N. Cowlin, Easterbrook, and Woodward.

THE LOCAL GOVERNMENT ANNUAL FOR 1902.—The eleventh issue of this very useful work (published at No. 2, Dorset-street, Fleet-street, E.C.) has been brought well up to date, and some new features have been introduced. The directory portion gives the names and addresses of the chief officials of all Corporations, London Borough Councils, County Councils, Boards of Guardians, Urban and Rural District Councils, County and Borough Asylums, &c, throughout the kingdom, as well as the public libraries, public parks, and City Companies of London. The names of committee chairmen in the Metropolitan boroughs, and the chairmen and vice-chairmen of the London County Council Committees are given for the first time. There is also useful information relating to the public libraries, baths and wash-houses, and electric light undertakings in the boroughs of London, and an abstract of the Local Government legislation of 1901. The charges for water and gas in London are shown, the population of the various provincial Unions is given, and a list of all the parks and open spaces of the Metropolis, with the Local Authorities controlling them. The book is sold at 1s. 6d.

LEEDS AND COUNTY BUILDERS' EXCHANGE.—The members of the Leeds and County Builders' Exchange held their annual dinner at the Hotel Metropole, Leeds, on the 24th ult. There was a company of about seventy, and the chair was occupied by the President of the club, Mr. E. Umpleby. After the loyal toasts, Mr. Paul Rhodes gave "The Lord Mayor and City Council." There were one or two eye-sores that he much wished to be removed. First and foremost, there was the ugly corner extending from the Queen's Hotel to Aire-street. When was this to be done away with, and when was the Midland Co. going to put up a station entrance here worthy of the city? There was another ugly corner opposite, which wanted dealing with speedily. Lastly, there was the wretched dismal pile of buildings opposite one of the grandest Town Halls in the kingdom. If the gentlemen who owned this property had anything like an eye for beauty, it ought to be all pulled down, so as to get a square there fit for the fifth city of the country. Ald. Carter responded. Mr. Wood Higgins gave "The Building Committee and Officials" of the Leeds Corporation; and, in doing so, regretted that work had been given to outside architects, as he was of opinion that there were men in the city who were capable of carrying out any work entrusted to them. Mr. E. W. Batley, who responded to the toast, said that Leeds, as a city, was second to none in the position it occupied with regard to its sanitary arrangements and its buildings right the way through, speculative or not. In his opinion, the speculative builder in Leeds had done good, honest work. Mr. Batley also paid a tribute to the capabilities of Leeds architects, who, he said, were as expert as any outside the city. As regarded the Midland Railway station, the Leeds Corporation had determined to do away with the objectionable goit in that district, and thus altogether improve the station and its surroundings. Under these circumstances, it would be only fair for the railway company to improve their station entrance, to say nothing of contributing a sum of money to the Corporation for the improvements effected. Mr. Towers also responded. The toast of "The Leeds and County Builders' Exchange," was proposed by Mr. W. Bower, who observed that, so far as their Exchange was concerned, they had no jerry-builders. The toast of "The Visitors" followed.

HOUSING SCHEME, SALFORD.—The Salford Corporation a short time ago applied to the Local Government Board for their sanction to the modification of a scheme for the housing of the working-classes in connexion with a block of property in Chapel-street, Salford. It was pointed out by the Corporation that the site in question was not in a suitable situation for the erection of artisans' dwellings, and was more suitable for warehouses. From this site 1,500 people were displaced, but they rehoused 672. There then remained accommodation to be provided for 828. It was also explained on behalf of the Corporation that they were erecting dwellings on the barracks site in Regent-road to accommodate 1,025 persons, and that they had further acquired a suitable site in Seaford-road, near the central electric car depot, whereon could be erected dwellings. A reply has just been received from the Local Government Board pointing out that they were willing to grant the modification asked for, subject to the Corporation housing the 828 people on the barracks site, and making provision for 1,200 people on the Seaford-road site.

THE SLATE TRADE.—The make of slates during the past year shows a considerable falling off, owing principally to the Penrhyn strike, which unfortunately still continues. Stocks both at Mold Junction and in the merchants' yards are very low, so, notwithstanding a falling off in the building trade in some districts, prices are likely to be maintained and demand increase as the season advances. The rise in prices in America and advance in freights caused by shipping combines will still further help the home trade.

PENRHYN QUARRY.—A letter signed by three of the Penrhyn Quarry workmen (Robert Jones, David Pritchard, and Melancthon Williams) has been sent to various Welsh newspapers, in which the writers deny that there is any dissatisfaction among those now at work at the quarries. They conclude:—"We have again and again said that we are entirely satisfied with Lord Penrhyn's terms, and once again we emphasise the fact that we are satisfied with the same reasonable and fair terms of Lord Penrhyn; and, moreover, we formally protest against the malicious rumours to which we have referred—there is not a shadow of truth in them. We are continuing in our employment, we are in complete accord with one another, we are increasing in numbers day by day, and there is an increase in the output of slates month after month. We appeal to and we invite our former fellow-workmen to come and judge for themselves whether the state of affairs is not as we say."

DRAUGHT PREVENTERS TO DOORS.—We have received the following suggestion from Mr. Edward A. Harman, M.Inst.C.E., the engineer and manager of the Huddersfield Gasworks:—"In workshops, messrooms, bathrooms, mills, and large factories the doors into the separate rooms frequently admit a furious draught. Various draught-preventers, patent and otherwise, have been tried, but perhaps one of the simplest extant is that of a roller, about 2 in. or 2½ in. diameter, of the width of the door, attached to the inside of it by means of a pair of lugs having vertical slots in them, instead of a circular hole; the small axle of the rollers thereby being allowed to slide freely up and down in the slot, and thus allow for any irregularities in the floor. The contrivance is a very simple one, and is capable of being adopted to the doors of outer kitchens, lobbies, sheds, &c., with a considerable reduction in the draught space available. It is really like a towel-roller placed on the floor. Care should be taken in fixing it that the lugs permit of the rollers being practically close to the door when fixed, and that they rest upon the floor. The writer has tried the above arrangement for some years with considerable success and comfort. In some cases the roller may be threaded in several pieces about 3 in. in length on an axle. Manifestly the small reels work more freely than a long one. Though only a trifling detail, yet details are of importance."

ST. SIMON'S, JERSEY.—A large two-light window has just been placed in this old church. The first light represents St. Martin dividing his cloak, and the second light St. John at the Latin Gate. The subjects stand under canopies of fifteenth century style. The window was executed at the studios of Messrs. Taylor & Clifton, of London, W.

MASTER BUILDERS' ASSOCIATION, HEREFORD.—The fifth annual dinner of the Hereford and District Master Builders' Association, which is affiliated to the National Federation of Building Trade Employers of Great Britain and Ireland, was held at the Mitre Hotel, Hereford, a few days ago. In the absence of the President (Mr. W. Lloyd), the chair was occupied by the Vice-President (Mr. C. Cooke), and the vice-chair by Mr. W. Powell. The loyal toast having been honoured, Mr. C. Beavan submitted "The Town and Trade of Hereford," Messrs. Hewitt and T. A. King replied. Mr. H. C. Beddoe then proposed "The National Federation of Master Builders of Great Britain and Ireland, and the South-Western Federation of Building Trade Employers." The builders, he remarked, had federated with a view to protection, and he was sure that none of the members desired to deal otherwise than straightforwardly with their workmen.—Mr. W. P. Lewis, senior, responded, and having referred to the representation on the Federation, the competition with trades unions, the hours of labour, rules, &c., and the work of carpenters and joiners, he said that they in Hereford might compliment themselves that they were going on amicably with their men in all trades. They were pleased at this satisfactory situation, and he hoped it would long continue. Matters had gone on very well with respect to the meetings of the National Federation.—Mr. W. Powell proposed "The Architects and Surveyors of Hereford," and said it was a mistake to think that the masters had banded themselves together to keep up prices generally. Competition now was keener than ever, and they had to meet with the times. All they asked for was fair trading. Mr. G. H. Godsell, in responding, said the architects and surveyors could not do without the builders. Referring to a non-return of expenditure upon labour, he said that bricklayers ten years ago laid more bricks than now. They would never educate a man to do his work under a certain time. They wanted an alteration in the apprenticeship and the bringing up of boys in trades. The class of work obtained now was not what it used to be. The builders had treated the architects and surveyors very well, but the position now, as compared with the early part of the nineteenth century, had changed. The architect used to dictate, and the builder obeyed. Mr. J. Parker also responded to the toast.—Mr. R. L. Bamford submitted "The Hereford and District Master Builders' Association." Their association contributed very considerably to the benefit of the building trade, to sanitation, and to the trade of the city generally. He recognised to the fullest extent the benefit and advantage of an interchange of those views which arose from such a meeting as this. The Chairman responded, and said it was necessary for builders to be federated, to unite, not for purposes of aggression or oppression, but for defence, and workmen were beginning to see they would have to be more reasonable in their demands, and not proceed in such a high-handed manner as in the past. No doubt trades-unionism became necessary in the past, when men were tyrannised over by unscrupulous employers, but now the trades unions constituted the tyrannical dictator, and it was absolutely essential that the builders should combine. Only by showing a united front could they be able to resist the unjust demands so constantly made by the operatives. There was now a code of rules fair as between employer and employed, and all they desired from a man was a fair day's work for a fair day's pay. It would be better for the parties concerned if all the builders were associated. Mr. L. Hodges proposed "Our Guests," and Mr. H. C. Beddoe and Mr. J. Mitchell responded. Mr. A. Dryland proposed "The President and Officers," and said he would like to see a better class of workman encouraged by the master builders, a prize, perhaps, to be offered to the man who did his work in the best possible manner. Could not this Association institute some means by which industrious workmen should be encouraged? Good honest labour ought to be assisted. Unless the cost of building could be reduced, he was afraid there was a bad time in store for the building trade.

LEGAL.

A PLYMOUTH ARCHITECT'S COMMISSION.

THE case of Keats *v.* Rendle came before the Court of Appeal, composed of the Lord Chief Justice, the Master of the Rolls, and Lord Justice Mathew, last week, on the appeal of the plaintiff, Mr. James Henry Keats, an architect, of Plymouth, from a judgment of Mr. Justice Day on February 11 last year, at trial with a jury at the Exeter Assizes.

Lord Coleridge, K.C., and Mr. Lloyd appeared as counsel for the appellant, and Mr. Duke, K.C., and Mr. Clavell Salter for the respondent.

Lord Coleridge said that the jury awarded the plaintiff 200*l.* damages, but his Lordship set the verdict of the jury aside and entered judgment for the defendant. The action was brought for architect's commission. The plaintiff had been engaged in the preparation and sale of a number of building estates, and came into communication with the defendant in 1885, who, with others, desired to develop an estate called the Vinstone building estate, near Plymouth. An arrangement was come to, the interpretation of which was that the plaintiff was to receive 5 per cent. commission on all land sold. The interpretation of the agreement was contained in a letter by plaintiff to defendant. A good deal was done on the estate, and plaintiff received from time to time commission on plots sold. On October 26, 1896, the defendant wrote to the plaintiff stating that it was probable the owners of the estate might receive an offer for a considerable portion of the property *en bloc*, when they would not require the further services of an architect. The defendant asked for the plaintiff's charges, as the account was to be settled with the co-owners, who wished to clear off all liabilities in respect of the estate. The plaintiff's contention was that this was contrary to the arrangement, and the case really resolved itself into one of damages for wrongful dismissal. The learned counsel said that the plaintiff had explained to the defendant that he was not anxious for the post except upon his own terms, which were that when any plots on the estate were sold he was to have 5 per cent. commission.

The Lord Chief Justice: Your case is, then, that they might never dismiss him.

Lord Coleridge: Not until the estate was sold.

Continuing, the learned counsel said the jury found a verdict for the plaintiff on a question of fact. It was true they did not give him all he claimed, their view being, he supposed, one of damages for wrongful dismissal. There was nothing to show that plaintiff could compel the owners to sell any more land, but there was nothing unreasonable in suggesting that the terms of the bargain were thoroughly understood, and that so long as they continued to sell, plaintiff was to receive 5 per cent. commission. The jury took the view that so long as plaintiff was willing to act for them the bargain could not be set aside. He submitted that the jury were right in their verdict, and that it ought not to have been set aside.

The Lord Chief Justice said he did not find anything to show that plaintiff should continue to act for ever, but that he should have 5 per cent. on the sale of land, whoever sold it. Did not that mean "whoever sells it so long as I am your agent"? Counsel had to show a contract continuing plaintiff as the agent so long as there was any land unsold.

Lord Coleridge replied that the jury evidently thought that such was the case.

Lord Justice Mathew: Was not the contract for services rendered on each occasion?

Lord Coleridge inferred that the class of house throughout the estate was to be selected by the

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vendors, so as to suit the neighbourhood and its requirements, and rather showed, if anything, that the plaintiff was to be the architect of the whole estate.

Lord Justice Mathew: Was he not the agent of the vendors?

Lord Coleridge replied that he might be called their agent in one sense.

Without calling upon counsel for the respondent, the Lord Chief Justice, in giving judgment, said that for upwards of twelve years the plaintiff had acted on certain terms, viz., that he was to receive 5 per cent. commission on sales of land for a certain estate, whether he made the sales or not. To that extent he thought the plaintiff had protected himself. It was now said there was also a contract that so long as the gentlemen concerned owned the estate, he would continue as their agent, or that if they did not, they would pay the 5 per cent. commission. In order to establish that, it must clearly appear on the face of the contract. He thought the outside it could be said to amount to was that it was a bargain during the time he was their architect, that whoever sold the land during that time he should get 5 per cent. There was nothing to show that the defendants had not got the right to determine the contract. He thought that Mr. Justice Day was right in setting aside the verdict, although he did not think he ought to have allowed the case to go to the jury at all.

The Master of the Rolls and Lord Justice Mathew concurred, and the appeal was accordingly dismissed with costs.

MEANS OF ESCAPE IN CASE OF FIRE FROM A FACTORY.

AT Guildhall recently, before Mr. Alderman Smallman, Miss A. E. B. Yeo was summoned for that she, on November 1 last, being within the meaning of the Public Health Act, 1875, owner of premises situate at 3, Lauderdale Buildings, Aldersgate-street, which premises were a "factory," unlawfully failed to comply with a notice served upon her by the London County Council specifying the measures necessary for providing the said factory on the stories above the ground floor with reasonable means of escape, in case of fire, for the persons employed there.

Mr. Thomas Chilvers, who appeared on behalf of the Council, put in a plan of the factory, and said that so far back as 1900 a letter was sent to Miss Yeo suggesting what should be done to render the place safe. The premises consisted of a basement and four floors above, and the only means of escape from the upper part, in the event of fire, was one narrow wooden staircase. At the time the first letter was written there were 258 persons employed on the premises. Various communications had passed between the Council and the defendant, but their suggestions had not been carried out—in fact, nothing at all had been done.

Mr. Robinson, for the defence, said the lessees were Messrs. James & Co., who were erecting new workshops with every modern improvement. They had been delayed by questions concerning ancient lights, &c. He asked for an adjournment of six weeks, at the end of which time Messrs. James & Co. hoped to be in their new premises.

Mr. Chilvers remarked that the London County Council had tried to meet the case in every way, but could take no further responsibility in the matter.

The Alderman pointed out that for fifteen months practically nothing had been done to comply with the Council's notice. He therefore imposed a fine of 10*l.*, with 2*l.* 2*s.* costs.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

17,338.—VENTILATION OF CLOSET BASINS: *C. Evans.*—Two inclined flanges or channels, in the shape of collars, are fashioned around the seat, or the top of the basin, of a closet to which a waste-water flush is supplied, and it is contrived that a pipe shall convey waste rain-water into the channels so as to ventilate the basin.

17,343.—A SPANNER: *A. H. Dougill.*—Stems provided with interlocking teeth carry the two jaws which can be locked on occasion by means of a sliding ring that forces the teeth together, as it is passed over the slightly tapering portion of the stem; a spring is employed for keeping the teeth out of their engagement.

17,374.—FLAPS FOR THE INLETS OF DRAINS, FOR DUST-BINS, &c.—*C. A. Bond.*—The invention is described as being applicable also to dust-bin covers, lift-doors, scavenger-cart covers, and similar objects. It consists of a hinged and weighted flap which—in the instance of a drain trap—is caused to press against an inclined seating, and thereby to prevent back-flow.

17,385.—FASTENINGS FOR WINDOWS AND DOORS: *A. Heller and J. Wenzel.*—The pulling of a ring or lever handle, having friction rollers at its end, lifts a lower bolt out of its socket, and with that motion the upper part of the bolt strikes a lever which draws the upper bolt downwards; the sockets are pivoted and are fitted with springs which enable them to give way upon impact with the bolts. In the case of sliding doors a key having two bits that work either with or without tumblers operates the bolts, upon the bevelled ends of which rollers may be mounted. The principle of the invention is available for sliding or hinged doors and windows.

17,411.—APPARATUS FOR WEIRS AND SLUICE-GATES: *S. H. Adams.*—A hollow chamber that slides in guides into a recess in the river-bed constitutes the weir, a flexible or telescopical pipe connects the chamber to the outlet-pipe, on which is a regulating cock; whilst the inlet pipe joins the chamber and a fixed level. As the water in the river rises above that level the chamber is filled, since the cross section of the inlet pipe is larger than that of the outlet pipe, and the weir will sink until the river-water falls below the fixed level, whereupon the weir rises as the chamber gradually becomes empty. In another shape the weir-chamber is open at the bottom, and a bent pipe from beneath it is passed, above the river-water level, to a dome within a closed chamber, into which water can be admitted through either a siphon from a flush tank or a pipe from the river when the level is abnormally high. A water-seal affords communication between the interior of the weir chamber and the river water, and the seal will be broken only by an excess pressure of air that is impelled into the chamber by the current of high-level water from the river into the closed chamber around the dome. Over the siphon is a tank, into which water is admitted through a cock worked with a float—the position of the float being regulated by means of a pipe that conveys water from the river.

17,428.—BEAMS AND GIRDERS: *H. J. Armstrong.*—For strengthening the webs of L, T, I, or other girders are devised diagonal or curved bars or flanged tubes that engage with grooves in the webs and are to be fastened by welding or with rivets. Flanged and half-conical struts stiffen the middle line of the girder, and hollow triangular struts are fashioned by bending the web-ends. The radius of curvature of each groove increases from the centre towards the ends of the girder.

17,432.—MECHANISM FOR LIFTS: *F. Bauke.*—A tube fits telescope-wise in another tube, which will fall and rise in a vessel containing liquid. The former tube carries the platform of the lift or cage. For lifting purposes an injector, supplied from a gas bottle, forces air under pressure to the tubes, and for purposes of lowering the air is allowed to effect its escape into a gasometer, which will also supply the injector.

17,477.—MEANS OF PILING TIMBER: *A. J. Tenow and J. E. Flodström*—Inclined planes, set at a zig-zag, direct the timber as it slides down from the conveyer. Ease of descent is provided for by means of pivoted and counterbalanced doors at the ends of the inclines, of which, under normal conditions, the doors constitute extensions. The timber is gathered on each door by a projecting arm or step, until the door falls and lowers the timber on to the incline next below. Each arm can also be turned so as to form an extension of the door, and thereby the timber can be discharged either to the left side, or to the right side when one of the middle stops has been turned downwards.

17,496.—A CEILING-ROSE FOR ELECTRICAL PURPOSES: *H. Hirst and H. Bevis.*—A rectangular projection is fashioned upon the insulating-base of the rose, and the hanging wires are passed through two opposite holes and slots in it to binding-screws upon metallic plates, the loops of the wires being inserted through long holes in the base and thence into terminals, which are slotted obliquely, upon the plates.

17,499.—PROCESS OF MOULDING TILES: *P. Bruns.*—A profile roller is fitted on to a sliding drum or hopper, which feeds material to the mould, and an eccentric oscillates a hinged stamping-iron, which presses the material; as a lever, a link, and an axle move the moulding-drum on the guides a curved slide hanging from pivoted arms is swung automatically out of action; on the axle is loosely mounted a double-toothed wheel set in gear with a fixed rack for driving the roller and the eccentric, and a foot-lever ejects the tile out of the mould.

17,502.—AN APPLIANCE FOR LAMP CHIMNEYS: *F. Altmann.*—The inventor's object is to facilitate the replacement of incandescent and other cylindrical lamp chimneys by means of a tubular guide, which is carried by levers above the holder in such a manner that room is left for the opening of the edges of the holder as the chimney is being put in; curved parts, actuated with springs, grip the chimney-holder, and the upper ends of the two levers or rods are compressed as one passes the curved parts over the expanding upper edges of the holder.

17,513.—MEANS OF DISINFECTING CISTERNS: *D. Provand.*—The contrivance relates to the disinfection of water-closet and other cisterns that are periodically emptied; a vessel fitted with an inlet and outlet is filled with some soluble disinfectant, and is then put into the cistern below the level of the water therein; as the cistern is being emptied some of the charged liquid will flow out of the vessel, the amount of discharge being regulated by means of a thin rod which slides into the inlet.

17,556.—LAVATORY-FITTINGS: *A. Hutchison.*—A flange at the foot of the bath carries the basin of which the discharge-pipe communicates with a trap having a dip-plate that is fashioned in one piece with the bath, and a screw-pin fastens the plug-seating; a common neck, serving for both hot and cold water, is fitted with a swivel in order that one may turn it over the bath or basin.

17,557.—A COLD-WATER PAINT: *G. R. King.*—An admixture is made of some albuminous substance, such as casein, and a base of plaster, chalk, talc, pigments, &c., and is ground. Another mixture is made of glue and hydrated lime, and ground. The two compounds are then mixed together with an addition of more of the base ingredient. The paint can then be mixed with water for use.

17,593.—IMPROVEMENTS IN DRAIN-PIPES AND GULLEY-TRAPS: *J. E. Leach.*—In the case of drain-pipes, a socket is fashioned upon the spigot-end for engagement with the customary socket. For traps, a flattened dome, mounted upon legs, is used for sealing the outlet. Flanges and a bail are provided above a silt-collecting vessel, which is laid over the dome, and slits enable the water to escape.

17,624.—APPLIANCES FOR LIFTING MACHINES: *F. W. Hollick and A. S. Hollick.*—The specification extends to appliances for use with hoists, cranes, winches, and capstans. A larger break wheel is mounted loosely upon the shaft, and around a brake wheel attached to the drum shaft, which is driven with epicyclical brake-gearing from the motor shaft; on to the larger brake wheel is pivoted a brake lever that is joined to a band upon the smaller brake-wheel, and has arms of unequal lengths, whereby the brake will automatically prevent the running down of the load when the larger brake-wheel is fixed, and when it is desired that the load shall run down one lifts a weighted lever so as to liberate the brake which, in normal conditions, grips the larger brake-wheel. A pinion, fastened upon the shaft, that gears with pinions mounted upon a brake-wheel, and with an interior spur wheel running loosely on the motor-shaft, form the epicyclical breaking gear, the speed of the drum-shaft depending upon the amount of force employed in bringing the brake to bear upon the last-named brake-wheel.

17,632.—A TRIPOD STAND: *A. Kaufmann.*—Each of the three legs is made by coiling a wedge-shaped strip of metal around the shank of a spike and inserting the end of the strip into a cap which is pivoted on to the table of the stand, the coil can be drawn out spiral-wise by pulling the spike downwards, and a scale for adjustment of height will thereupon become uncovered for use.

17,642.—ELECTRICAL-CURRENT METERS: *W. du B. Duddell.*—Near the movable thermo-couple of a radio-micrometer is placed a stationary non-inductive resistance, through which flows an alternating or a continuous current; the inventor contrives that the deflection shall afford a measure of the heat which is developed in the resistance, and of the current as well; he specifies a radio-micrometer after the kind described by Mr. C. V. Boys in vol. 180 of the *Philosophical Transactions of the Royal Society*, but he adopts variations of the indicator and suspension, and does not insist upon the retention of the copper heat-receiving plate; for use with large currents the heating-resistance may be shunted, or it may be used with a series resistance for measuring electrical pressures.

17,684.—MECHANISM FOR BALL-AND-FLOAT VALVES: *F. Wangelin.*—For shutting an inlet nozzle there is a cap having beneath it a washer that is to be kept down with a screw at the end of a lever which is pivoted on to a bent carrier; set-screws control the play of the lever, on to which is pivoted the arm of the float, the latter play being controlled with a screw inserted through another arm; the reversal of the float-arm can be effected by means of a similar arm underneath, and the screw which holds down the cap and washer will serve for regulating the constancy of the discharge.

17,700.—CONSTRUCTION OF KILNS: *W. L. Jackson.*—The double roof of each kiln, being one of a group disposed around a common middle chimney, constitutes a chamber wherein air can be heated for drying the goods in another of the kilns, or into which products of combustion can be admitted from one of the kilns for heating the goods in another, dampers being fitted on the pipes that connect the chambers and on the air-inlet pipes. Each kiln is placed in direct communication with the chimney. The openings in the inner wall of each roof-chamber have covers that can be handled through openings in the top, and the inner openings serve for the admission of heated air into the kiln, or for the passage of hot gases into another kiln.

MEETINGS.

FRIDAY, JANUARY 31.

Architectural Association.—Mr. C. Harrison Townsend on "Originality in Architectural Design." 7.30 p.m.

Institution of Civil Engineers (Students' Meeting).—Messrs. J. C. Collett and W. H. C. Clay on "The Quay-Walls of Keysham Harbour." 8 p.m.

Institution of Mechanical Engineers.—An extra meeting, when the paper entitled "Modern Workshop Methods," by Mr. H. F. L. Orcutt, will be further discussed. 8 p.m.

SATURDAY, FEBRUARY 1.

Architectural Association.—First Spring Visit, to Christ Church, Brixton-road, by permission of Professor Beresford Pite, the architect of the building.

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Sanitary Inspectors' Association.—Nineteenth Annual Dinner, Venetian Chamber, Holborn Restaurant. 6.30 p.m.

British Institute of Certified Carpenters (Carpenters' Hall).—Council meeting 3 p.m. Monthly meeting 6 p.m.

St. Paul's Ecclesiological Society.—Annual meeting: Chapter House. 2.30.

Edinburgh Architectural Association.—Visit to Archers Hall, Buccleuch-street.

MONDAY, FEBRUARY 3.

Royal Institute of British Architects.—(1.) To announce the name of the person the council propose to submit as a fit recipient of the Royal gold medal 1902. (2.) An Address to Students, by Mr. John Slater, B.A.Lond., Vice-President; and a Criticism of the Designs and Drawings submitted for the prizes and studentships 1901-1902, by Mr. H. T. Hare. (3.) At the conclusion of the above the presentation of prizes will be made by the chairman. 8. p.m.

Clerks of Works' Association of Great Britain.—Annual dinner, King's Hall, Holborn Restaurant. Mr. Aston Webb, A.R.A., will take the chair. 6 p.m.

London Institution.—Mr. C. H. Reilly, M.A., on "City Buildings, Old and New," illustrated. 5 p.m.

Society of Engineers.—(1.) The President for the past year, Mr. Charles Mason, will present the premiums awarded for papers read during the year. (2.) The President for the year 1902, Mr. Percy Griffith, will deliver his inaugural address. 7.30 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. E. J. Steegmann on "Mechanical Physics: Laws of Motion, Hydraulics, &c." 7 p.m.

Society of Arts (*Cantor Lectures*).—Dr. Samuel Rideal on "The Sterilisation of Water, IV." 8 p.m.

Liverpool Architectural Society (*Incorporated*).—Mr. Robert Pepys Cockerell on "The Life and Works of Prof. Charles Robert Cockerell, R.A." Illustrated by lantern slides and original drawings. 6 p.m.

TUESDAY FEBRUARY 4.

Society of Arts (*Applied Art Section*).—Rev. H. Thurstan on "The History of the Rosary in All Countries." 4.30 p.m.

Cardiff, South Wales, and Monmouthshire Architects' Society.—Paper by Mr. Edwin Seward. 8 p.m.

Institution of Civil Engineers.—Papers to be further discussed:—1. "The Sewerage Systems of Sydney, N.S.W., and its Suburbs," by Mr. Joseph Davis. 2. "The Bacterial Treatment of Trades Waste," by Mr. William Naylor. 8 p.m.

WEDNESDAY, FEBRUARY 5.

Royal Archæological Institute.—(1) Viscount Dillon, P.S.A., on "Horse Armour." (2) Mr. J. H. Round, M.A., on "Castle Guard." 4 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. E. J. Steegmann on "Natural Forces; Light, Heat, Electricity, Chemistry." 7 p.m.

Institution of Civil Engineers.—Students' visit to the Royal Mint, Tower Hill, E.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Northern Architectural Association.—Mr. Nigel Bond, M.A., on "The Work of the National Trust for Places of Historic Interest," with lantern illustrations. 7.30 p.m.

Edinburgh Architectural Association.—Mr. W. Davidson on "Winchester, Salisbury and Wells, and their Surroundings," illustrated by lime-light views." 8 p.m.

Royal Philosophical Society of Glasgow.—Mr. Ebenezer Howard on "Garden-Cities," with lime-light views. 8 p.m.

THURSDAY, FEBRUARY 6.

Society of Arts (*Indian Section*).—Professor Wyndham R. Dunstan on "The Coal Resources of India." 4.30 p.m.

FRIDAY, FEBRUARY 7.

Architectural Association Discussion Section.—Mr. J. Dudley Forsyth on "Stained Glass." 7.30 p.m.

Institution of Junior Engineers (Westminster Palace Hotel).—Paper on "The Electric Passenger Elevator," by Mr. William J. Cooper. 8 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. E. J. Steegman on "The Atmosphere; Pressure and Composition: Air; Combustion and Respiration." 7 p.m.

Glasgow Architectural Craftsmen's Society.—(1) Mr. J. S. Robertson on "Stone"; (2) Mr. R. Armour, jun., on "Brick." 8 p.m.

Birmingham Architectural Association.—Mr. E. P. Hinde on "Elementary School Planning."

SATURDAY, FEBRUARY 8.

Dundee Institute of Architecture.—Mr. Menart on "A Comparison of Continental and British Architecture." 7 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 15.—By CHARLES YOUNG (at Petersfield).

Liss, Hants.—A freehold allotment, 5 a. 3 r. 27 p. £280

January 17.—By ROBERTS, SON, & TORY (at Yeovil).

Yeovil, Somerset.—12, Middle-st., f. (including goodwill) 2,250

January 19.—By HANNAFORD & SON (at Okehampton).

Broadwoodkelly, Devon.—Upcott Estate, 120 a. 2 r. 15 p., f. 2,820

Winkleigh, Devon.—Garret's Tenement, 8 a. 1 r. 26 p., f. 325

January 21.—By DEBENHAM, TEWSON, & CO.

City of London.—Moor-lane, site of the Church of St. Bartholomew (together with the fabric), area 6,300 ft., f. 20,400

Aldgate.—No 28, f., r. 150*l.* 3,350

Kennington.—Smith-st., f.g.r. 20*l.*, reversion in 45½ yrs. 710

Smith-st., f.g.r. 12*l.* 10s., reversion in 45½ yrs... £370

Warham-st., f.g.r. 10*l.*, reversion in 45½ yrs. ... 290

By DRIVERS (Holloway).

Holloway.—3 and 4, Andover-row, u.t. 50 yrs., g.r. 8*l.* 320

8, Bedford-ter., u.t. 54 yrs., g.r. 5*l.* 265

55, 57, and 59, Campbell-rd., u.t. 64 yrs., g.r. 15*l.* 350

Finsbury Park.—47, Lennox-rd., u.t. 63 yrs., g.r. 5*l.* 10s., r. 34*l.* 305

By W. N. WILLOUGHBY.

Norwood.—9, Ulverstone-rd., u.t. 93½ yrs., g.r. 6*l.* 10s., r. 35*l.* 345

By ORGILL, MARKS, & LAWRENCE (at Masons' Hall Tavern).

Shaftesbury Avenue.—The Shaftesbury p.-h., f., with goodwill 20,300

January 22.—By SALTER, REX, & CO.

Kentish Town.—Willes-rd., i.g.r. 12*l.*, u.t. 19½ yrs. 160

2, Willes-rd., u.t. 19½ yrs., g.r. 5*l.*, r. 55*l.* 440

6, Willes-rd., u.t. 19½ yrs., g.r. nil. r. 50*l.* 395

8 to 14 (even), Willes-rd., u.t. 19½ yrs., g.r. 8*l.*, r. 162*l.* 1,430

16, 18, and 22, Willes-rd., f., r. 142*l.* 2,545

Willes-rd., f.g.r. 7*l.*, reversion in 19½ yrs. 410

26, Willes-rd., u.t. 19½ yrs., g.r. 4*l.*, r. 42*l.* 345

Willes-rd., i.g.r. 12*l.*, u.t. 19½ yrs., g.r. 4*l.* 100

4, Inkerman-rd., u.t. 22½ yrs., g.r. 1*l.*, r. 30*l.* 265

96, Chetwynd-rd., u.t. 67 yrs., g.r. 7*l.*, r. 48*l.* 525

By DANIEL WATNEY & SONS.

Vauxhall.—Albert Embankment, The White Lion p.-h., a part c.g.r. and part f.g.r. 120*l.*, reversion in 37 yrs. 3,550

By DOUGLAS YOUNG & CO.

City of London.—Fleet-st., &c., a freehold corner building site, area 550 ft. 10,150

Hoxton.—51 and 52, Herbert-st., and 1, Trinity-pl., u.t. 40½ yrs., g.r. 18*l.* 18s., r. 110*l.* 1,100

Clapham.—Clarence-rd., f.g.r. 15*l.*, reversion in 33 yrs. 600

Wimbledon.—Queen's-rd., The Limes, f., r. 55*l.* 840

January 22.—By BALCH & BALCH (at Camden Town).

Kentish Town.—121, Leighton-rd., u.t. 39 yrs., g.r. 5*l.*, e.r. 36*l.* 370

January 23.—By CHADWICK & SONS.

Holborn.—6 and 7, Holborn-buildings, f. 3,110

By HERRING, SON, & DAW.

Clapham.—152, 152A, and 154, High-st., with range of stabling in rear, u.t. 14 yrs., g.r. 39*l.* 10s., r. 200*l.* 1,425

16, North-rd., u.t. 38½ yrs., g.r. 8*l.* 460

Streatham.—Leigham-av., Gwynfain, e.r. 120*l.*; also i.g.r. 28*l.*, u.t. 45 and 47 yrs., g.r. 24*l.* 1,500

Leigham Court-rd., The Lodge, u.t. 64½ yrs., g.r. 15*l.* 1,120

By C. C. & T. MOORE.

Forest Gate.—14 and 16, Salisbury-rd., u.t. 76 yrs., g.r. 10*l.* 380

Barking, Essex.—91 to 39 (odd), Morley-rd., f. 720

Highbury.—53, Wyatt-rd., u.t. 68½ yrs., g.r. 5*l.* 290

Mile End.—126, 128, and 130, Skidmore-st., u.t. 29 yrs., g.r. 12*l.* 595

Pimlico.—169, Vauxhall Bridge-rd., u.t. 23 yrs., g.r. 8*l.* 500

By NEWBON EDWARDS, & SHEPHARD.

Clerkenwell.—171, Rosebery-av., u.t. 93 yrs., g.r. 7*l.* 225

Caledonian-rd.—28 and 29, Edward-sq., u.t. 38 yrs., g.r. 10*l.*, r. 76*l.* 635

Stoke Newington.—3, 5, 7, and 9, Prince George-rd., u.t. 91 yrs., g.r. 26*l.*, r. 136*l.* 1,410

Islington.—18, Sherborne-st., u.t. 41 yrs., g.r. 6*l.*, r. 40*l.* 350

By PRATT & MARSLAND.

Leytonstone.—Park Grove-rd., Newlyn, f. 240

By STIMSON & SONS.

Old Kent-rd.—Verney-rd, The Canal Potteries, area 35,000 ft., u.t. 52¾ yrs., g.r. 235*l.* 4,200

Brixton.—48, Pulross-rd., u.t. 62¾ yrs., g.r. 4*l.* 4s. 1, 5, and 7, Shannon-gr., u.t. 65¾ yrs., g.r. 3*l.* 12s. 300

Bromley, Kent.—Canon-rd., 4 plots of land, f. 1,050

Bermondsey.—23, 24, and 25, Thorburn-sq., u.t. 40¼ and 44¾ yrs., g.r. 18*l.* 130

Hornsey.—25, Hillfield-av., u.t. 89¾ yrs., g.r. 6*l.*, r. 45*l.* 1,235

Mitcham, Surrey.—7, Glebe-villas, u.t. 68 yrs., g.r. 9*l.* 490

By CHARLES VARLEY.

Canonbury.—4, Petherton-road, u.t. 47½ yrs., g.r. 10*l.* 10s., r. 80*l.* 315

By T. WALKER & SONS (at York).

Easingwold, Yorks.—Driffield Farm and Cobb Farm, 183 a. 2 r. 37 p., f. 675

January 24.—By ELLIS & SON.

Sandgate, Kent.—90, 90A, and 92, High-st., area 5,000 ft., f., r. 205*l.* 4,000

By W. B. HALLETT.

Holloway.—410, Camden-rd., u.t. 40 yrs., g.r. 10*l.*, e.r. 80*l.* 3,650

Crouch Hill.—21, Ashley-rd., u.t. 73 yrs., g.r. 9*l.*, r. 70*l.* 730

760

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; yd. for yard.

NATIONAL FEDERATION OF BUILDING TRADE EMPLOYERS.—At the annual meeting of the National Federation of Building Trade Employers held in London on the 29th ult. it was resolved to take the opinion of the employers on the question of fixing a date for the simultaneous termination of all notices with reference to working rules with the operatives.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 11 6	per 1,000 alongside, in river.	
Rough Stocks and Grizzles	1 9 6	,, ,,	,,
Facing Stocks	2 12 0	,, ,,	,,
Shippers	2 5 0	,, ,,	,,
Flettons	1 8 0	,, at railway depôt.	
Red Wire Cuts ..	1 12 0	,, ,,	,,
Best Fareham Red	3 12 0	,, ,,	,,
Best Red Pressed Ruabon Facing.	5 5 0	,, ,,	,,
Best Blue Pressed Staffordshire ..	4 6 6	per 1,000 at railway depot.	
Do., Bullnose	4 10 0	,, ,,	,,
Best Stourbridge Fire Bricks	4 5 6	,, ,,	,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers.....	13 0 0	,, ,,	,,
Headers	12 0 0	,, ,,	,,
Quoins, Bullnose, and Flats	17 0 0	,, ,,	,,
Double Stretchers	19 0 0	,, ,,	,,
Double Headers..	16 0 0	,, ,,	,,
One Side and two Ends	19 0 0	,, ,,	,,
Two Sides and one End	20 0 0	,, ,,	,,
Splays, Chamfered, Squints	20 0 0	,, ,,	,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,, ,,	,,
Quoins, Bullnose, and Flats	14 0 0	,, ,,	,,
Double Stretchers	15 0 0	,, ,,	,,
Double Headers..	14 0 0	,, ,,	,,
One Side and two Ends	15 0 0	,, ,,	,,
Two Sides and one End	15 0 0	,, ,,	,,
Splays, Chamfered, Squints.....	14 0 0	,, ,,	,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,, less than best.	

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	32 0	per ton, delivered.
Best Ground Blue Lias Lime..	25 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. od. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.	
Bath ,, ...	1 7	,, ,,	
Farleigh Down Bath ..	1 8	,, ,,	
Beer in blocks	1 6½	,, ,,	
Grinshill ,, ...	1 10	,, ,,	
Brown Portland in blocks	2 2	,, ,,	
Darley Dale in blocks..	2 4	,, ,,	
Red Corsehill ,,	2 5	,, ,,	
Red Mansfield ,,	2 4	,, ,,	
Hard York in blocks ..	2 10	,, ,,	
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup)	2 8	per ft. super. at rly. depôt.	
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,	
,, ,, 5 in. sawn both sides slabs (random sizes)	1 3	,, ,,	
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,	
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.	
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft super. deld. rly. depôt.	
,, ,, 3 in. do.	1 2½	,, ,,	

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	11 15 0	per 1000 of 1200 at rly dep.
,, best seconds ,,	11 5 0	,, ,,
16×8 best ,,	6 12 0	,, ,,
20×10 best blue Portmadoc	11 5 0	,, ,,
16×8 best blue Portmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green....	12 2 6	,, ,,
16×8 ,, ,,	7 5 0	,, ,,
20×10 permanent green	10 5 0	,, ,,
16×8 ,, ,,	5 17 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles..	41 6	per 1,000, at rly. depot.
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes).	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,

[See also page 123.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Fountain	Committee of Provost Scott Fund	Not stated	Feb. 15.
*Laying-out Pleasure Ground	Aldershot U.D.C.	20*l.*, 10*l.* and 5*l.*	Mar. 1
*Proposed Public Offices	do.	100*l.*, 75*l.* and 50*l.*	Mar. 29
*New Town Hall	Harrogate Corporation	150*l.*, 100*l.*, and 75*l.*	May 14
Bridge, Stakeford, Northumberland		Not stated	No date

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Supply of Road Materials to Royal Parks	Commissioners of H.M. Works, &c	H.M. Office of Works, Storey's Gate, S.W.	Feb. 3
Villas, Hessle, near Hull	Mr. W. Peacock	A. T. Martindale, Architect, 66, Wellington-road, Bridlington	Feb. 4
Steel Pipes (900 tons)	Manchester Corporation	G. H. Hill & Sons, Civil Engineers, 3, Victoria-st., Westminster	do.
Additions to Fechney Schools, Perth		David Stuart, Architect, Perth	do.
House, Church-lane, Pudsey, near Leeds	Mr. J. H. Dixon	Buttery & Birds, Architects, Queen-street, Morley	do.
Alterations to Premises, 13, Chapel-st., Bridlington	Leyton (Essex) U.D.C.	J. Earnshaw, Architect, Bridlington	do.
Road Materials, &c.	Hackney Borough Council	W. Dawson, Civil Engineer, Town Hall, Leyton	do.
*Hardwood Paving	Mirfield (Yorks) U.D.C.	Borough Engineer, Town Hall, Hackney	do.
Widening Road, Snakehill	Mallow (Ireland) R.D.C.	F. H. Hare, Civil Engineer, Mirfield	Feb. 5
Cottages	Manchester Corporation	M. Regan, Workhouse, Mallow	do.
Greenhouse, &c., Monsall Hospital	New Maldon and Coombe U.D.C	City Surveyor, Town Hall, Manchester	do.
Public Offices, Fire Station, &c.	Norwich Corporation	C. T. Lewis, 7, Market-place, New Maldon	do.
Picture Gallery at Castle Museum	Southend Corporation	A. E. Collins, Civil Engineer, Guildhall, Norwich	do.
Pier Works, &c.		A. Fidler, Civil Engineer, Southend	do
Road Works, Grays, Essex	Barnsley Corporation	G. W. Cobham, Surveyor, 1, Edwin-road, Gravesend	do.
Church, Tonyrefail, Wales	Wellingborough U.D.C.	E. M. Bruce Vaughan, Architect, Cardiff	do.
Steel Girder Bridges, Deepcar and Soughley	Hull Corporation	Borough Surveyor, Town Hall, Barnsley	do.
Paving Works, High-street	Mr. W. Hathaway	E. Sharman, Surveyor, Market-square, Wellingborough	do.
Police Station, Alfred Gelder-street	Hetton (Durham) U.D.C.	J. H. Hirst, City Architect, Town Hall, Hull	do.
Shop, near Rawmarsh, Yorks	Mr. G. Ferguson	J. Platts, Architect, Old Bank Buildings, Rotherham	do.
Sewers, &c.	Leith Town Council	J. Harding, Surveyor, Hetton-le-Hole	do.
Additions to Langton House, East Molesey	Fulham Council	D. G. Andrew, Architect, Bridge-road, East Molesey	do
Sewers, &c., Ann-street	Mestag School Board	Borough Surveyor, Town Hall, Leith	do.
*Making-up and Paving Roads	Wandsworth & Clapham Union	Borough Surveyor, Town Hall, Fulham	do.
Additions to Schools, Nantyffyllon, Wales		E. W. Burnett & Sons, Architects, Pondu, near Bridgend	Feb. 6
*Covered Way and other Works, Tooting Home	East Retford R.D.C.	C. A. Sharp, Architect, 11, Old Queen-street, S.W.	do
Church, Ordsall, Retford	Cardiff Corporation	C. Hodgson Fowler, Architect, Durham	do.
Granite Road Metal, &c.	Radcliffe (Lancs) U.D.C.	T. Henry, Surveyor, Retford	do
Additions to Engine House, &c., Cogan Pumping Stn	Meath R.D.C.	C. H. Priestley, Engineer, Town Hall, Cardiff	do.
Chimney, Dale-street		W. L. Rothwell, Engineer, Radcliffe	do.
Ten Cottages, Drogheda, Ireland	Stockport Corporation	L. Turley, Civil Engineer, Drogheda	do.
Alterations to Chapel, Blaenau Gwent, Wales	do.	A. Jones, Rosebery-street, Abertillery	Feb. 7
House, Crumlin, Mon.	Sheffield Corporation	R. L. Roberts, Architect, Abercarn	do
Eighteen Houses, Treorky, Wales	Hertfordshire County Council	M. Falcon, 33, Bute-street, Treorky	do.
Road Works	Leicester Corporation	J. Atkinson, Civil Engineer, St. Peter's Gate, Stockport	do.
Surveyor's Materials, &c.	Mr. Richard Rigg	do.	do
Shops, Angel and King-streets	do.	Gibbs & Flockton, Architects, 15, St James'-row, Sheffield	do.
Granite and Slag	Knutsford U.D.C.	U. A. Smith, County Surveyor, 41, Parliament-street, S.W.	do.
Public Baths, West Humberstone		A. H. Hind, Architect, 3, Grey Friars, Leicester	do.
Additions to Crown Hotel, Bowness	Accrington Co-op. Society, Ltd.	S. Shaw, Architect, Kendal	do.
Villas, Bowness	Midland Railway Company	do.	do.
Sewers, &c., St. John's-road	Newport (Mon.) Town Council	W. J. Downes, Surveyor, Council Offices, Knutsford	do
Twelve Houses, Aberaman	Rugby R.D.C.	G. A. Treharne, Architect, 18, Canon-street, Aberdare	do
Villa, Hirwain, near Aberdare	Donegal Guardians	do.	do
Shops, Stores, &c.	Shrewsbury Standing Jnt. Comm	Haywood & Harrison, Archt., Post Office Chambers, Accrington	do.
*Engine Shed, &c., Stockingford	Isle of Ely County Council	Company's Architect, Cavendish House, Derby	do.
Car Sheds, &c.	Ballymena Guardians	Borough Engineer, Town Hall, Newport	Feb. 8
Granite Road Metal	Jarrow Town Council	J. W. Pendred, Rugby	do.
Additions to Infirmary	Kingston-on-Thames Guardians	D. C. Pearson, Workhouse, Donegal	do.
Police Offices	Lathom and Burscough U.D.C	A. T. Davis, County Surveyor, Shire Hall, Shrewsbury	do.
Road Metal, &c.	St. Marylebone Council	H. F. Simpson, County Surveyor, Wisbeach	do.
House, Killyfast, Toome, Ireland	do.	C. Johnston, Workhouse, Ballymena	do.
Road Works, &c. Russell-street	Whitehaven Guardians	J. Petree, Borough Surveyor, Jarrow	Feb. 10
Church, Wellington-street, Stockton	Bromley U.D.C.	T. W. T. Richardson, Architect, 57, High-street, Stockton	do.
Road at Workhouse	do.	J. Edgell, Union Offices, Kingston	do.
Sewerage Works, Ormskirk, Lancs.	Surrey County Council	J. T. Wood, Civil Engineer, 3, Cook-street, Liverpool	do.
*Carting Slops and Sweepings	Willesden District Council	Council's Engineer, Town Hall	do.
*Watering Streets and Roads	do.	do.	do.
Cottage, Porthcawl, Wales	West Ham Council	S. H. Stockwood, Bridgend	do.
Infirmary	do.	G. Boyd, Civil Engineer, 33, Queen-street, Whitehaven	do.
*Widening Park-road	Battersea Borough Council	Council's Surveyor, Bromley, Kent	Feb. 11
*Road Making and Paving Works	Watford Gas Company	do.	do.
*New Technical Institute, Wimbledon	Hammersmith Council	G. H. Fox, Architect, 9, John-street, Adelphi, W.C.	do.
*Annual Contracts	Woolwich Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
*Guernsey Broken Granite	Bristol Docks Committee	do	do.
*Tenders for Supplies, &c.	Holborn Union	Borough Engineer, Town Hall, Stratford, E.	do.
*Tenement Houses, Stratford	Long Sutton (Lincs.) U.D.C.	Borough Engineer, Town Hall, West Ham, E.	do.
*Annual Contracts	Commissioners of H.M. Works	Borough Surveyor, Municipal Buildings, Lavender Hill, S.W.	Feb. 12
Gasholder Tank, &c.	Belper, R.D.C.	H. E. Jones & Sons, Engineers, Palace Chambers, Westminster	do
*Annual Contracts	R. Gerrish	Borough Surveyor, Town Hall, Hammersmith	do.
*Annual Contracts	Belfast Corporation	Borough Engineer, Maxey-road, Plumstead	Feb. 17
*New Docks and Works, Avonmouth	Hackney Union	Engineer's Office, Underfall Yard, Bristol	Feb. 13
*Supplying Steam Boilers and Engineering Works	Fulham Guardians	J. Buley, Suffolk House, Laurence Pountney Hill, E.C.	Feb. 18
Broken Ganite, &c. (900 tons)	Middlesex County Council	T. S. Mossop, Council Offices, Long Sutton	do
*Enlargement of Croydon Crown Post Office	do.	H.M. Office of Works, Storey's Gate, S.W.	Feb. 21
Road Metal, &c.	Messrs. A. Sanderson & Co.	R. C. Cordon, Surveyor, Duffield, near Derby	Feb. 22
*Residence, Salisbury	Messrs. J. Leyman & Co., Ltd.	F. Bath, Architect, Salisbury	do
Technical Institute	Manchester Corporation	S. Stevenson, Architect, 83, Royal Avenue, Belfast	Feb. 26
*Casual Wards and other buildings, Hackney Wick	Messrs. J. J. and A. S. Ward	Clerk's Offices, Homerton, N.E.	do
*Chimney Shaft	Mr. N. J. Hall	F. H. Medhurst, Engineer, 13, Victoria-street, S.W.	do
*Cartage of Road Materials	Pendlebury U.D.C.	County Engineer, Middlesex, Guildhall, Westminster, S.W.	Mar. 4
*Supply of Road Materials		do.	do
Warehouse, Humber Bank, Hull		Freeman, Son & Jaskell, Architects, 11, Carr-lane, Hull	No date
Offices, Stores, &c., St. Andrew's Dock, Hull		do	do.
Two Houses, London-road, Newcastle-under-Lyme		W. Campbell, Architect, 2, Bagnell-street, Hanley	do.
Setts, &c.		Borough Surveyor, Town Hall, Manchester	do.
Street Works, Ratcliffe Gate, Mansfield		Vallance & Westwick, Surveyors, Mansfield	do.
Works at House, Sadberge, near Darlington		J. Allen, Borough-road, Darlington	do.
Villa, Alexandra-road, Penzance		O. Caldwell, Architect, Penzance	do.
Cottage, Brook-street, Carlisle		W. Pogson, Architect, Devonshire-street, Carlisle	do.
Two Villas, Sherwood Rise, Nottingham		Collyer & Slater, Architect, 8, Bridlesmith Gate, Nottingham	do.
Public Baths, Victoria Park, Swinton, nr. Manchester		T. J. Bushell, Architect, 18, John Talton-street, Manchester	do.
Drain Pipes, &c., Rawcliffe		R. W. Fearnley, Ackworth, near Pontefract	do.

[See also next page.

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PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
Land Surveyor and Valuer	Middlesex County Council	800*l.*	Feb. 7

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. *Contracts, pp.* iv. vi. viii. x. xii. *&* xxiii. *Public Appointments,* xviii *&* xxiii.

PRICES CURRENT (*Continued*).

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	15 10 0
Deals: best 3 by 9	13 0 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in	10 0 0	11 0 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in. .	8 10 0	9 10 0
2½ in. by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 11 in.	0 10 0	more than battens.
½ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft.)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	15 0 6	16 0 0
Second yellow deals, 3 in. by 11 in.	17 0 0	18 0 0
,, ,, 3 in. by 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	13 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	12 10 0	13 10 0
Battens, 2½ in. and 3 in. by 7 in.	10 10 0	11 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	19 0 0	20 0 0
Do. 3 in. by 9 in.	16 0 0	17 0 0
Battens	12 10 0	13 0 0
Second yellow deals, 3 in. by 11 in.	14 0 0	15 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	11 10 0	12 10 0
Do. 3 in. by 9 in.	11 0 0	12 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	13 10 0	14 10 0
,, ,, ,, 3 in. by 9 in.	12 10 0	13 0 0
Battens	10 10 0	11 10 0
Second white deals 3 in. by 11 in.	12 10 0	13 10 0
,, ,, ,, 3 in. by 9 in.	12 0 0	12 10 0
,, ,, ,, battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes..	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
½ in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6

Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders ,, ,,	8 0 0	9 0 0
Angles, Tees and Channels, ordinary sections	8 2 6	9 2 6
Flitch Plates	8 10 0	0 0 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

PRICES CURRENT (*Continued*)

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -
("And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	13 10 0	- - -
Pipe in coils	14 0 0	- - -
Soil Pipe	16 10 0	- - -
ZINC—Sheet— Vieille Montagne ..... ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet ..... per lb.	0 1 0	- - -
Thin ,,	0 1 1½	- - -
Copper nails ..... ,,	0 1 1½	- - -
BRASS— Strong Sheet ..... ,,	0 0 11	- - -
Thin ,, ... ,,	0 1 1	- - -
TIN—English Ingots ..... ,,	0 1 3	- - -
SOLDER—Plumbers' ..... ,,	0 0 6½	- - -
Tinmen's ..... ,,	0 0 8	- - -
Blowpipe ..... ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths	3½d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, fourths	4½d. ,, ,,
32 oz. thirds	5¼d. ,, ,,
,, fourths	5½d. ,, ,,
Fluted sheet, 15 oz.	3¼d. ,, ,,
,, 21 ,,	4¼d. ,, ,,
⅛ Hartley's Rolled Plate	2¾d. ,, ,,
3/16 ,, ,, ,,	2¾d. ,, ,,
¼ ,, ,, ,,	2¾d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 8
,, ,, ,, in barrels	,,	0 2 9
,, ,, ,, in drums	,,	0 2 11
Boiled ,, ,, in pipes	,,	0 2 10
,, ,, ,, in barrels	,,	0 2 11
,, ,, ,, in drums	,,	0 3 1
Turpentine, in barrels	,,	0 2 6
,, in drums	,,	0 2 8
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	,,	21 0 0
Best Linseed Oil Putty	per cwt.	0 8 6
Stockholm Tar	per barrel	1 12 0

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	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work ..	0 16 6
Best Elastic Copal Varnish for outside work ..	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

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* Denotes *accepted.* † Denotes *provisionally accepted.*

BROADSTAIRS.—For alterations and additions to Bleak House, for Mr. Thomas Barry. Mr. William A. Burr, architect, 76, Chancery-lane, W.C.:—

	Victoria Stone.		Terra-cotta.
Denne	£3,978	....	—
Whiteley, Ltd.	3,850	....	£3,796
May	3,816	....	3,816
Stevens Bros.	3,770	....	3,780
Martin	3,640	....	3,625
Brown	3,500	....	3,412
Paramor	3,485	....	—
Gann & Co., Whitstable*	2,945	....	2,910

BUSBY (N.B.). — For the execution of sewerage works, &c., for the District Committee of the Middle Ward of the County of Lanark. Mr. W. L. Douglass, C.E., 3, Clydesdale-street, Hamilton. Quantities by Engineer:—

A. Robertson	£4,125 13 8	Stirling & Kinniburgh	£3,124 9 4
McKerracher & Son	3,410 13 7	D. & J. Stratton	2,991 4 11
Shanks & McEwan	3,396 0 11	Brown Bros.	3,061 11 1
T. Christie	3,390 0 0	Craik & Tuckwell	2,960 0 3
A. Duncan	3,311 15 8	J. Pollock	2,738 6 10
Harvie & Co.	3,192 1 5	J. Johnstone, Bellshill*	2,500 16 1
Brebner & Co.	3,175 2 3		
Henderson & Duncan	3,144 12 5		

CORK.—For the re-erection of mills, John-street, for Messrs. Eustace & Co. Mr. A. Hill, architect, George's-street, Cork:—

J. Lynch	£5,200	P. Murphy	£4,455
D. Hagarty	4,900	T. Delany	4,380
D. O'Callaghan	4,547	E. & P. O'Flynn*	4,360

CROYDON.—For highway improvements, Beddington, Coulsdon, &c., for the Rural District Council. Mr. R. M. Chart, surveyor, Council's Offices, Town Hall, Croydon:—

W. Pearce	£10,525	W. Shepherd	£7,010
Fry Bros.	8,170	Streeter Bros.	6,697
Mowlem & Co.	8,038	Free & Sons	6,356
W. Langridge	7,380	East Acton Tar Paving Co.	6,329
Lawrence & Thacker	7,348	E. Iles	6,065
W. H. Wheeler	7,233		

HOLMES CHAPEL.—For alterations and additions to the Hermitage, Holmes Chapel. Messrs. Maxwell & Tuke, architects, &c., 41, Corporation-street, Manchester:—

Beckett & Co., Hartford, Cheshire* £2,250

HOLYHEAD.—For the erection of a school, Kingsland, for the School Board of Holyhead. Mr William Williams, architect, 1, Park-terrace, Holyhead. Quantities by same:—

Williams & Son £1,450
E., R., & J. Owen, London House Holyhead* 1,074

[*See also next page.*

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KING'S LYNN.—For work at High School for Girls, King's Lynn, Norfolk. Mr. Herbert J. Green, architect and surveyor, 31, Castle Meadow, Norwich :—

H. W. Barnes	£3,862 7 0	A. F. Foreman	£3 358 5 0
W. H. Brown	3,757 16 0	R. Dye	3,346 0 0
P. Banyard	3,473 19 7	Bardell Bros.	3,257 0 0
J. W. Collins	3,453 0 0	R. Shanks	3 186 2 0
J. Medwell	3,440 1 10	J. Cracknell, Peterborough†	3.085 7 0
Renaut Bros.	3,383 0 0		
Tash, Langley, & Co.	3,359 10 9		

† Accepted conditionally.

LONDON.—For alterations to premises Nos. 145 and 147, North End, Croydon (Croydon Guardian Offices), first portion. Mr. F. Windsor, architect, Croydon :—

Huntley	£145 0 0	Card*	£132 10 0
Hubbard	135 0 0	Shirley	122 12 6

LONDON.—For alterations, additions, and repairs to 304, High Holborn, for Messrs. Godwin & Son. Mr. William A. Burr, architect, 76, Chancery-lane, W.C. :—

	For alterations.	For repairs.
Langham	£410	£81
Larke & Son	344	64
Hocking*	275	51

MITCHAM.—For the enlargement of the Lower Mitcham Schools, for the School Board. Mr. H. Carter Pegg, architect, Thornton Heath :—

C. Sayers	£3,010 14 9	Smith & Sons	£2,742 0 0
E. J. Saunders	2,980 0 0	Stewart & Sons	2,698 0 0
Hobbs Bros.	2,836 0 0	E. J. Burnand, Wallington*	2,695 0 0
W. H. Parslow	2,797 8 7		

MORPETH.—For the erection of a hospital, Low Black Close, for the Ashington Urban District Council. Mr. A. Wood, architect, Market-place, Ashington :—

Braithwaite	£1,084	Gordon Bros., Stakeford, Morpeth*	£995

NEWBIGGIN-BY-SEA.—For the erection of sixteen cottages, for Newbiggin Co-operative Society, Ltd. Messrs. Boolds & Hardy, architects, Morpeth. Quantities by architects :—

Gibson Bros., Newbiggin* £2,375

[Eight other tenders.]

PAIGNTON.—For alterations to warehouse and shops for Messrs. Osborne & Son. Messrs. Bridgman & Bridgman, architects, Torquay and Paignton. Quantities by Mr. Vincent Cattermole Brown, Paignton :—

G. Webber	£620	H. Webber & Sons	£559
W. H. Lethbridge	599	R. Harris*	424
E. Westlake	579		

SIDCUP (Kent).—For additions, redrainage, and alterations to The Hollies House, to adapt same as the administrative block of the new children's homes, for the Greenwich Union Guardians. Messrs. Thomas Dinwiddy and T. Norman Dinwiddy, architects. Quantities by Mr. Louis Jacob :—

E. Mills	£6,146	Staines & Son	£4,644
G. Jackson	5,066	J. Lonsdale	4,594
H. L. Holloway	4,864	W. Mills	4,277
T. D. Leng	4,825	W. Nash	4,087
B. J. White	4,677	T. Rowbotham*	3,677

PRESTWICH.—For building a house for Mr. Henry Baler, Guest-road, Prestwich. Messrs. Maxwell & Tuke, architects, &c., 41, Corporation-street, Manchester :—

Leach & Sons, Prestwich* £997

WEDNESBURY.—For the execution of paving works, High-street, Market-place, &c., for the Corporation. Mr. E. Martin Scott, Borough Engineer, Town Hall, Wednesbury. Quantities by the Borough Engineer :—

Contract No. 1.

T. Woodhouse	£1,550 0 0
J. Mackay	1,392 14 7
Patent Victoria Stone Co., Ltd.	1,346 2 7
F. J. Smith	1,318 0 0
J. White, jun.	1,155 17 10
Currall Lewis & Martin	1,127 11 1
E. Boore	1,110 17 9
W. Westwood	1,075 10 8
A. Cooper	1,028 9 6
Empire Indurated Stone Co.	1,011 2 4
H. Weldon	943 10 7
G. Trentham, Handsworth*	942 4 8

Contract No. 2

Patent Victoria Stone Co., Ltd.	£1,109 7 6
T. Woodhouse	1,00. 0 0
Empire Indurated Stone Co., Ltd.	879 12 3
The Hard York Non-Slip Stone Co., Ltd.	830 0 0
E. Boore	827 9 6
H. Weldon	821 4 6
Patent Indurated Stone Co., Ltd.	803 3 9
Ellis & Sons, Ltd.	792 8 9
Currall Lewis & Martin	783 7 3
A. Cooper	770 12 9
G. Trentham*	713 0 0
John Mackay	701 2 9
Watson & Co.	674 2 0
Abell & Cammall	661 5 0
John White, Jun.	639 6 3

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Tradition and Invention in Architecture.

"Ah but traditions, inventions
(Say we and make up a visage),
So many men with such various intentions,
Down the past ages, must know more than this age!
Leave we the web its dimensions."

Browning.

THE ever-recurring question as to the position of modern architecture with reference to the forms of architecture of past times has occupied more attention than usual during the past few days. It has been the subject of a thoughtful paper at the Architectural Association last week, and it was touched upon again in Mr. Slater's address to the students at the Institute meeting last Monday. To Mr. Jackson's remarkable letter in last week's *Guardian*, which partially dealt with the same subject, we have already referred.

No consideration of the subject can well be very profitable unless in the first place we recognise fully the wide difference between the conditions of architecture in the present day and the conditions under which the leading styles of the past were evolved. We cannot expect a national style nowadays, in the same sense in which English Gothic, for example, was a national style, because we are not sufficiently isolated, and have no new problem of construction to work out. National styles were worked out in a manner of their own, because there was no disturbing element from the knowledge of what was being or had been done by other nations; tradition was followed, and further developed, because there was nothing else that men were tempted to follow; and also, in the case of Gothic architecture, because there was a complicated structural problem to work out. Modern engineering has such a problem in dealing with steel construction, and hence it has, in a sense, a style, but not a national one; English, American, French, and German engineering are all much the same thing, with only some minor differences in the method of treating minor points of construction. In the case of architecture, which is the art of building with expression and for the sake of beauty, we are acquainted with the characteristics of all the former distinctively developed styles of the world; our minds cannot remain uninfluenced by them; and even if we are led to agree that tradition should count for something in modern architecture, we are brought up by the question—"*which* tradition?"—for there are so many. There stand all those finished styles behind us; are we to ignore them in our modern design, or are we to accept and make use of them as ready-made materials in which to work out our own ideas? Had there been only one style of the past—one pre-Renaissance style—the question would be very much simplified. It might then be fairly argued, why not keep to the traditional expression of structure, and give a historic unity to architecture? But under the actual circumstances this argument breaks down, for we have to select one particular tradition and leave out the others; and it is difficult to see a reason for taking up with one rather than the other, except the mere fact that, for some feeling of taste or association, we like it better.

The English Gothic revivalists endeavoured to get a logical standing ground by the cry—"carry on our national and indigenous style; return to that, and cast away Classic revivals and Italian importations." Something more might have been made out of this had the task been gone about in a less conservative spirit. It was the ultra-faithfulness to the original model, the unwillingness to stray from or modify it, which destroyed what life there might otherwise have been in the Gothic revival, as the same error had previously killed the Greek revival, after a much shorter and, on the whole, less productive existence. That lesson seems not to have been without its effect; the most thoughtful architects of the present day do not profess, at all events, the production of close imitations of either Greek or Gothic buildings. But there is a new class of traditionalists, if we may so call them, who think they have got hold of another logical standpoint, which is to go back beyond the days of the modern revivals, and keep to traditional English detail as it was then; *i.e.*, to Georgian detail. Nor do they seem to make any particular effort to develop the style further; they appear to be very well content with quoins and keystones, and white window-frames flush with the outer wall-plane, and so on. Meanwhile, they take credit to themselves for insisting on good work; sound and solid workmanship, my masters, and no bedizenments. This has its wholesome side, no doubt; but the result is a school of architecture which is somewhat prim and uninteresting; one which, while avoiding vulgarity, is also destitute of great or imaginative quality, as will be felt as soon as its comparative novelty is worn off.

There does not seem to be any real standpoint between accepting various architectural forms of the past as recognised material for use—not necessarily in sheer mechanical imitation, but as far as general idea and treatment are concerned—and giving up all attention to past forms altogether, and resolving to fashion everything for ourselves independent of precedent. And the latter position is practically impossible, except on the understanding that we give up everything except bare structure. This is what two or three thorough-going enthusiasts appear, theoretically, to wish for; but we observe that cornices and columns are after all to be found in their executed designs; forms for which they are mainly indebted to precedent, though they may have modified them in detail. In short, it is impossible to get away from architectural precedent except by giving up all which we have hitherto been accustomed to regard as architecture. Not only has no individual ever consciously invented a style in architecture; it may be said that no one generation has. What we now recognise as styles have been the slow and hardly conscious development of generations. No man can devise an architectural style out of the depths of his inner consciousness. If we are to have architectural detail at all, we

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must be beholden to precedent for a great deal of it, in general suggestion if not in actual imitation. Gothic architecture is linked with Greek by a long train of precedent, the forms of each age being only slightly modified from those immediately preceding it. Neither Greek nor Gothic architect knew anything of "originality" as it is now understood.

To throw away all the traditional forms of architecture is to cut ourselves off from all the advantage of all the shaping power of the brain of man for ages past. We cannot invent anything better than a column with a capital to carry a horizontal member; we may dismiss it and put a plain post instead; but that is not originality. Of course we need not copy any particular form of column and capital exactly; we may have a modification of our own to put into it (though possibly we shall not improve it); but at any rate we are indebted to precedent for the general form, and we cannot avoid it.

Mr. Townsend, in his paper, drew a parallel between architecture and poetry, and between the column and the sonnet. He argues that it is as absurd to copy an ancient column because it is perfect, and call that modern art, as it would be to copy a sonnet of Shakespeare's because it was perfect, and call that modern poetry. But the analogy is not quite sound. A column has only one function; to support weight—that is the *thought* in the column. But a sonnet is only an artistic way of expressing thoughts, not a thought; it is an artistic form of literary expression; but a thousand writers may use it, in the same language and with the same arrangement of lines and rhymes, and yet all their thoughts be quite original and distinct. The real parallel is not between the sonnet and the classical column, but between the sonnet-*form* and the column, as a mode of expression.

We may carry this idea further, and draw a parallel between architectural style, considered at large, and poetic style and form. A man may write a poem in twelve cantos in the Spenserian stanza without copying the "Faerie Queene"; his ideas may be quite different and quite original, but he adopts Spenser's form of expression. So a man may design a building in Greek or Gothic style which nevertheless may be no copy of any Greek or Gothic building. He adopts a style of expression formulated by the architects of a previous age, as the poet may adopt a style formulated by Spenser. Both may be original in the most essential sense.

In short, our point would be that originality in architecture consists much more essentially in the plan, conception, and grouping of a building than in its detail; and that it is in plan especially that we ought to see more originality. The basic idea of an architectural conception lies in the plan and grouping, and we do not see nearly enough thought and originality in planning. Take as an example M. Girault's admirable "Petit Palais" at Paris. That is really a thoroughly original building; it is a new architectural conception; but the detail, though treated with some individuality, is all based on recognised Classic forms. The originality lies in the conception as a whole.

Do we then wish to see the idea retained of designing in this or that style? No; and especially not from the client's point of view. No architect should be invited to design a building "in such-and-such a style." To ask him to do that is to start him on the wrong track at the outset. Ask him to design a building for a certain purpose, and leave the treatment to him. But it does not follow that he may not himself choose to clothe his building in detail derived from or suggested by a certain past style, if he takes that as a point of departure and not in a spirit of slavish imitation, and if he chooses it because his special sympathies are with it. Our modern school of traditionalists professedly adopt the tradition, and imitate (and rather slavishly imitate) the details, of the style nearest to us in point of time before the days of the revivals. But if tradition is to be recognised at all, we do not see why there may not be a choice of traditions, and why a traditionalist may not, quite logically, choose to go further back to what he regards as a finer and nobler tradition.

Of course, supposing an architect takes such a traditional style as his starting point, the more originality he can put into it the better, if such originality is an improvement and a further development. That, however, is a counsel of perfection, and only within the power of a man of genius, and one who is content, and is permitted, to take far more time over the study and elaboration of his detail than is generally allowed for in these days of hurry. Otherwise, the "original" detail is not unlikely to be out of harmony with the rest. That is one of the advantages which the adoption of a past style gives; there is a harmony in the details; perhaps partly the result of association of ideas on our own part, but also to a great extent due to the fact of their being all worked out by a generation of architects who concentrated their minds on one school of detail, and knew of or cared for no other. In some recent designs in which originality of detail has been palpably aimed at, the drawback has always seemed to be that there was a scrappiness, a want of coherence, in the details, as if they did not belong to one another. Now coherence of manner in detail, unity of style and scale, is one of the most important elements in architecture, and that is why the study of the Classic Orders still remains, and perhaps always will remain, the best initial training for a student. It alone familiarises him with the idea of interpendence in style and scale between the whole design and the details, provided always that it is recognised and used as a means of training, and not as providing mere models for copying from.

In the case of decorative details derived more or less directly from Nature, it is important to bear in mind that novelty of detail derived from too close an imitation of Nature is apt to produce results at variance with true and consistent architectural style. In the description, under the head of "Illustrations," of Mr. Townsend's own building, the Horniman Museum—a building which we admire very much, both for its general picturesqueness and the arrangement of the plan and section—we have interpolated a sketch of a foliage capital, one of the illustrations sent us by the architect. That is a novel bit of detail, but it is to our mind much too naturalistic for architectural detail; and that is one of the dangers to which the search for novelty in carved detail often leads. It is absolutely essential to architectural style that foliage ornament should be conventionalised into architectural form. The variety of natural foliage, in minor details, is almost infinite; but conventionalism is under the necessity of sacrificing many of these minor details. In other words, the more you conventionalise, the more you reduce the number of the possible types of architectural foliage ornament, because you cannot obtain a conventionalised form without a certain sacrifice of natural detail. We do not want carved plants on a building; we want types founded on Nature, but not imitative. Those who seek for variety by means of imitative carving almost unavoidably sacrifice style; and the game is not worth the candle.

The conclusion of the whole matter seems to be this: if an architect have the genius and the patience to work out a consistent style in all the details of his building, without any absolute imitation of past styles, well and good. If he have not, it is better for him to accept a recognised style of detail than to erect a building without style and consistency; always remembering that the exercise of original thought in the planning of the building, and in the adaptation of the style to its requirements, is an opportunity of which no theory of architectural tradition can deprive him.

ART IN THE THEATRE.

THE presentation of "Ulysses" at Her Majesty's Theatre affords an interesting example of the point at which we have arrived in what may be called the æsthetic development of the modern drama. Here is an instance of a play founded on a Classic story of undying interest, written by one of the most prominent of the younger generation of English poets, to the scenic setting of which several of the most eminent archæologists of the day have lent their aid, and the incidental music to which is written for the occasion by one of the cleverest and most promising of our younger musical composers. What a remarkable advance is this in æsthetic conception of the drama in England, compared with the times which many of us can remember, when scenery was provided with regard solely to a momentary effect, without consideration of historic truth or local colour, and when any sort of music would "do"—theatre music being in fact a kind of by-word among seriously-minded amateurs.

We do not generally profess to include the drama within our programme, but in the mounting of Mr. Phillips's play there are scenes which are of distinctly architectural interest, for we have the attempt to reconstruct the Homeric palace, the details and arrangement of which we may probably assume to be mainly due to Mr. Lethaby, whose name is mentioned as one of the coadjutors in the piece. The third scene of the first act takes place in the forecourt of Ulysses' palace, which is filled by the revelling suitors. The main arrangement had evidently been suggested by the plan of the palace of Tiryns. We look across the courtyard, and see the end façade of the great hall, the μέγαρον, on our left, and opposite to us the entry, up some steps, to the women's quarters. This is also the place of entry to the women's quarters at Tiryns, but the rooms themselves were not, as

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represented at the theatre, in the rear of this entrance, they were connected to the rear angle of the *μέγαρον*, and the entry from the courtyard only gave access to the corridor leading round to them. In the house of Ulysses, according to the Homeric account, the women's quarters were evidently in the rear of the *μέγαρον*, but could no doubt be reached without going through the hall; and though the sleeping apartments of the women may probably have been on an upper story, their day-room would almost certainly have been on the ground floor level. The steps at the theatre are neither one thing nor another; they remove the women's apartments from the ground level, but they are not high enough to be accepted as leading to an upper story. This arrangement, therefore, can hardly be accepted as historic, and is perhaps covered by the sentence in Mr. Tree's prefatory Note, to the effect that use has been made of Professor Lethaby's architectural and archæological designs "with due regard to the requirements and limitations of the stage"; but the Tiryns plan might have been adhered to in this case, for Penelope's entry would have been in the same place, only she would have emerged from a corridor instead of from an improbable house. However, one must not demand absolute accuracy in such matters in a stage scene; it is enough if the atmosphere of the time and place is suggested. It is of course a wooden Greek architecture that we see; the barbaric-looking gilt columns in front of the *μέγαρον* are quite in keeping; the square panelled piers (or painted in panels) at the angle of the portico are not so convincing. The interior of the hall in the last scene strikes us as much more realistically archaic Greek: the animal paintings on the lower part of the wall; the ornament above, with the thin characteristic Mycenæan scroll; the columns with their quasi-Egyptian palm capitals; the sacred tree painted over the doorway; and the ceiling painted in squares of black and white (we think we can lay our finger on the particular vase in the archaic room of the British Museum that suggested that detail)—all these combine in a thoroughly old-world effect, wrought out with great care and success.

The scenic effects, in the ordinary sense of the word, are very fine. Mr. Craven's Calypso's Isle in the second scene, with its embowering trees, is a perfect paradise; and his scene of the approach to Hades, before a cavern "amid the tumbled fragments of the hills," with the yellow gleam of sunlight seen above the tops of the rocks, is a most powerful picture, rendered all the more impressive by the thin wailing of the ghosts faintly heard through the opening. The scene in Hades is very finely managed, but would be more impressive if it could be shortened a little; after seeing it too long the glamour begins to wear off and we become more conscious of the machinery. But it is a very fine and truly Homeric effect when the assembled ghosts, at the close of the scene, give vent to lamentations at seeing the living man go up again to the upper day, whither they may not accompany him, and stretch their hands towards the ray of sunlight. This is really a pathetic realisation of the ancient Pagan feeling about the dead.

The costumes do not profess to be of the Homeric period (for which indeed there are hardly data sufficient); some of those of the women are exceedingly picturesque. The bright and gay costume of the world-wandering hero on Calypso's island rather jars on one as out of place. We like better Matthew Arnold's picture (in "The Strayed Reveller")—

> —— "Ah, who comes forth
> To thy side, Goddess, from within?
> How shall I name him?
> This spare, dark-featured,
> Quick-eyed stranger?
> Ah, and I see too
> His sailor's bonnet,
> His short coat, travel-tarnished,
> With one arm bare."

The "sailor's bonnet"—that kind of conical skull-cap familiar to us from ancient and often-copied representations—we had; but there was a little too much finery in the costume otherwise.

Regarding the music, we are told in the *programme raisonnée* that "while there is nothing aggressively modern, there is certainly nothing aggressively Grecian about it, so far as modes and mannerisms go." We are more inclined to agree with the latter than the former part of the sentence. There is nothing Grecian about it whatever, either in modes or in sentiment or anything else. We will not say it is "aggressively" modern, which would be vituperative; but, though fine and effective in itself, it is a great deal too modern to accompany an ancient Greek story. Not that we want an attempt (always futile) at realising Greek music; but there should be something of the calmness and severity of character which belongs to Greek art, in music set to accompany or illustrate a Greek story.

Of course, after all said and done, "the play's the thing," and if it is not within our province to enter into literary criticism, we may recognise that, though the piece no doubt owes much to spectacular effect, it is a poem worth, and even suggestive of, a fine scenic setting; and the musical lines which from time to time strike on the ear (not always with as clear enunciation as they deserve) seem only in keeping with the gorgeous scenery. Indeed, why should not the story of Ulysses have a romantic setting? Is it not in itself the most romantic story in the world?

Mr. Tree shows a perfectly admirable make-up as Ulysses (by the way, since the gods in the play have their Greek names, why is not the hero "Odysseus"?), and there is a great deal of really fine and impressive acting in his part and in those (more especially) of Athenè, Calypso, and Penelope. The suitors and their female friends (like Mr. Coleridge-Taylor's music) are rather too boisterous; and though the fat suitor, Ctesippus, is certainly amusing, he suggests Plautus rather than Homer. The scene of the slaughter of the suitors cannot of course be given as in Homer, but it is effectively managed; and it is curious to feel how this incident of the disguise and sudden discovery of the avenging hero, from a story three thousand years old, can still hold a modern audience in interest and suspense.

After the slaughter of the suitors, the curtain falls upon the silent embrace of Ulysses and Penelope in the middle of an empty stage—a pathetic and impressive conclusion to what is at once a fine drama and a splendid spectacle.

NOTES.

The London Water Bill.

THE Government Water Bill is pretty much what has been expected for some time. It proposes to create a special body to take charge of the water supply of London, numbering sixty-seven, with a paid chairman and deputy-chairman. This seems a singularly stupid and unbusinesslike measure. The body to be created is very unwieldy, for it has to be borne in mind that the management of the water supply of the Metropolis and its suburban districts is after all a fairly simple matter. In the great provincial towns it is managed by a Committee of the Town Council. It is in our opinion a great mistake to establish another active body, and it would have been far better to have given the management of the water supply to the London County Council, with power for a few representatives of the suburban districts to attend the Water Committee. Out of the proposed Water Parliament of sixty-seven members, forty-six are to be chosen from London, of whom ten are to be elected by the County Council, thirty-four by the Municipal Boroughs, and two by the City. The others come from outside London. It is to be noted that the companies are to be bought out at a fair valuation, and that nothing extra is to be paid for compulsory purchase. This is a good feature in a Bill which in its main features is retrograde and clumsy.

County Council Works Department.

THE adjourned debate of the London County Council on Tuesday on the Report of the Works Department was a very unsatisfactory performance. The main point of that Report was that the actual costs of the works executed by the Council's own department during the past year considerably exceeded the final estimates. The Moderate party in the Council thereupon loudly cry out that there is a loss on the work done by the Council without the intervention of a contractor. Nothing can be more fallacious than this reasoning. If a landowner who prefers to do his own work receives from his agent an estimate that a set of farm buildings will cost 500*l.*, and when the work is done he finds that he has spent 600*l.*, he does not say that he has lost 100*l.*, only that the work has cost more than he expected. No reasonable ratepayer can possibly be deluded by the arguments of the Moderates. It does not, however, follow that the Works Department is perfect, but whether the Council pay too much is a matter which can only be decided by a careful investigation by skilled persons into the prices paid for material and cost of labour, supervision, and so forth. We are sometimes surprised that the Progressives do not institute some such inquiry by a competent outsider. A satisfactory Report would enable the ratepayers to know the truth about the Works Department, and, if favourable, would put an end to the attacks upon it.

Liverpool Cathedral.

THE Liverpool Cathedral Committee have circulated a statement of their arguments in favour of the St. James's Mount site, and answers to the objections made to it. Their statements appear to us to be exceedingly misleading to those who do not know the ground. They show, indeed, that the site is

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fairly accessible, but the statements as to its "prominence," merely because it is 24 ft. higher level than Monument-place, are absurd. Prominence of a site does not depend merely upon its being so many feet above a datum line. What they mean by maintaining that there is a better vista to the site than at Monument-place we cannot understand. They quote Mr. Oldrid Scott's words to the effect that "the site in itself is a particularly fine one, and one which any architect would take delight in dealing with. It is very peculiar, as the plateau stands some 15 ft. above the flanking road. This would give a splendid effect to the principal façade, which would have a fine open space about 500 ft. in depth leading up to it." What is meant by "the principal façade" we do not know, for we have been told that the cathedral must be aligned north and south, and in that case the side parallel with the public road would be the flank of the building. The position of the Committee is further fortified by the opinions of the Dean of Ely, to whose preposterous proposal for treating the plan we have already referred, and of Sir E. Russell, who is known as a journalist and a politician, but is no authority on architecture, and who compares the St. James's Mount site to that of the church of Montmartre at Paris—a comparison the absurdity of which will be evident at once to those who, like the present writer, know both Liverpool and Paris well. The supporters of the Monument-place site, it must be admitted, do not appear to have quite fairly stated their case in regard to the proximity of tramways: the tramways would run very close to the cathedral. But why emphasise the fact that they are electric trams? Surely an electric tram, running on smooth rails with no horses, is the quietest of public conveyances, rather than the most noisy.*

Westminster City Council and the Widening of the Strand.

THE Westminster City Council have resolved, on the recommendation of their Improvements Committee, to offer a sum of 90,000*l.* for the land, computed to be about 4,374 superficial ft., that would be taken for the proposed widening of the Strand to 80 ft. between Terry's Theatre and the Hotel Cecil. To that area is to be added some land that would be surrendered without payment by the Worcester Buildings Company in terms of the Company's covenant with the late Strand District Board of Works, and the City Council's offer is made subject to the condition that the London County Council contribute a further sum of 20,000*l.* in respect of the setting back of the three houses, Nos. 91-2-3 (between Carting-lane and Beaufort-buildings), which would cost, it is calculated, 31,787*l.* The total estimated outlay upon the improvement amounts to 92,590*l.*, towards which the London County Council have agreed to contribute 50,000*l.* Thus, under the arrangement now proposed, a net expense of about 22,600*l.* will devolve upon the City of Westminster. In a "Note" on October 6 last we mentioned some of the historical associations that belong to the houses affected by the scheme—one of them, No. 96, at the corner, east, of Beaufort-buildings, having been built in 1826, after J. B. Papworth's designs, and occupied by Rudolph Ackermann. The project extends to a raising of the level of Beaufort-buildings and the closing of Herbert's-passage in the rear of the Strand.

The L.C.C. and the Gas Light and Coke Co.

THE London County Council has decided to call another conference of representatives of the City Corporation and the Metropolitan boroughs on the north side of the Thames, with a view to taking action to compel the Gas Light and Coke Co. to supply gas at a cheaper rate. The price charged by the Gas Light Co. is now 3s. per 1,000 cubic ft., while the South Metropolitan Co. charge only 2s. 3d. for the same quantity of gas. Since last July a new factor has had to be taken into account in the comparison, for since that date the standard illuminating power of the South Metropolitan gas has been reduced from sixteen to fourteen candles, while the standard north of the Thames remains sixteen candles. We do not know whether the officers of the London County Council have made any comparative tests to ascertain the values of the two qualities of gas for heating purposes and for incandescent lighting; but if such tests have been made and corroborate the statement that there is no appreciable difference between the two qualities of gas for these purposes we see no reason why the Gas Light Co. should not be called upon to supply the lower-grade gas at a reduction of 2d. per 1,000 cubic ft. The price would then be 2s. 8d., compared with 2s. 3d. south of the Thames. The remaining difference of 5d. is partly accounted for by the fact that the South Metropolitan Co. charge a rental for consumers' meters, while no rental charge is made by the Gas Light Co., but the major portion is accounted for by the excessive capitalisation and less successful management of the latter undertaking. Within a year or two it will be necessary for the Gas Light Co. to apply to Parliament for power to raise further capital, and it may then be possible to induce Parliament, in view of the unusual circumstances of the case, to take unusual action in favour of the consumer. For the present the public representatives can do little but prepare themselves for the moment when they can take action with some effect. It will be necessary to be ready with facts and practicable reform proposals in place of vague grievances.

Calcium Carbide Manufacture.

JUDGMENT was delivered on Monday last in a case of great importance to the acetylene industry. The Acetylene Illuminating Co. claimed the sole right to manufacture calcium carbide in the United Kingdom, and entered an action against the United Alkali Co. for alleged infringement of their patents. Mr. Justice Buckley decided that the Willson patent, upon which the Acetylene Illuminating Co. relied, is not valid, and that there had been no infringement. The result of this decision (if the decision is not reversed upon appeal to a higher Court) is to render it legal for anyone to manufacture in the United Kingdom, or to import, calcium carbide produced in an electric furnace. One of the barriers to the free development of the acetylene industry has, in consequence, been removed.

Hampstead Heath.

THE Hampstead Heath Protection Society have issued their Fifth Annual Report. At the close of it they record their appreciation of the care bestowed on the Heath by the London County Council, and their opinion that its condition shows marked improvement. They think, however, that there is urgent need of further supervision throughout the night and in the early morning, which is very likely the case. The Society have been active throughout the year in resisting the attempts of the promoters of the Charing Cross, Euston, and Hampstead Railway Bill; and here they are doing good work. A proposal for another railway under the Heath, under the name of the "Hampstead and Edgeware Railway," naturally intensifies the objections felt by the Committee. In regard to some smaller matters the Committee seem to be rather in want of excuses for interfering. Why these reiterated protests against the "trees on the east side of Spaniards'-road"? Surely trees can do no one any harm. But as far as the railways are concerned we fully sympathise with the attitude of the Society, who are doing a public service in opposing them. If these railways are made, Hampstead Heath will be ruined—that is the plain English of it.

Steps at Doorways.

THE case of Davies *v.* Tree, which resulted in a verdict for 150*l.* damages against the proprietor of Her Majesty's Theatre in consequence of injuries sustained by a visitor to the theatre, should be instructive to architects who are ill-judged enough to plant a door on the top of a 6-in. step, so that the fact of the existence of a step is only visible from one side of the door (and may be overlooked even then). The plaintiff's case was not one of the best in the world: he was apparently in an excited state and in a great hurry to inquire as to some presumed mistake about his seats, and he went very quickly through a door which he said was pointed out to him by an attendant, but which in the evidence it was shown was not intended for the public, but only for the staff. In spite of this, however, the jury awarded him very substantial damages for the injuries which he received from a fall caused by the unexpected step in the doorway; and we think they were right. Of course one must sympathise with Mr. Tree, who has had to pay for the mistake of his architect; but perhaps the verdict will serve to impress upon some architects that it is a mistake, and a very stupid one, to place a step just under the closing line of a door, and that their clients may have to pay for it, and will not love them therefore.

Lettering on Drawings.

IN reference to a recent Note which we published on lecture diagrams, and the importance of having them drawn so as to be really intelligible to the audience, a correspondent writes to the effect that "it might be worth while drawing attention to the differ-

* We observe that while the partisans of the Monument-place site assert that the traffic will be no disturbance, and cite the case of St. Paul's, the Cathedral Committee argue that this is no test, because the traffic is only on one side of the Cathedral, and "there are no electric trams." This is absurd. The traffic outside St. Paul's on a week-day is a larger and more noisy traffic than any that would ever run outside the Liverpool Cathedral if on Monument-place, and yet it is scarcely noticeable from within the Cathedral. It was different in the days, which we can remember, when St. Paul's Churchyard was paved with cobble stones. The rumble was formidable then, but it is not now, nor would it be so at Monument-place. We are quite convinced that as regards the Monument-place site, the objection of the noise of traffic may be disregarded: it is a mere bugbear.

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ence between architects' and engineers' practice in the lettering on drawings. For exhibition purposes it may look better to put fancy letters, that very few people can read. As to this, I do not wish to express any opinion, but when it comes to working drawings, which will be traced and retraced both in the architects' and the builders' offices, it would be much better for every one concerned if only plain letters, that could be easily read by the builder's foreman, were used." We quite agree with our correspondent, but we doubt if the habit of writing cryptic letters on working drawings, or at all events on detail drawings, prevails to any great extent. If it does, it is a very foolish one. Where we have generally seen cryptic lettering is on competition drawings and on drawings prepared for publication. Occasionally it is difficult to make out what are the names of the rooms on plans lettered in this fashion. We like to see style in an architect's lettering, but the best style consists in combining fine character with legibility, as seen in so many examples of Renaissance lettering, both English and Italian. But it may be questioned whether lettering on working drawings ought not to be merely the kind of lettering workmen are most accustomed to read, as our correspondent seems to suggest.

Mr. Hollyer's Photographs.

MR. HOLLYER has won a name for himself as an artist by his platinotype reproductions of the works of the Pre-Raphaelites. To him is very largely due the increasing popularity and intelligent understanding of this group of artists' work. He has had access to many works that are now less and less likely to be seen by the public, and has placed sympathetic and truthful reproductions within the reach of every art lover. This in itself is something, even if the reproductions were no less mechanical than the majority of the copies of great pictures. But they are more than this; take, for example, Mr. Hollyer's reproduction of Mr. Watts's wonderful picture, "Time, Death, and Judgment." It conveys the greatness of the original to a remarkable extent, and faithfully depicts the qualities of tone and texture. The present exhibition at the Egyptian Hall, Piccadilly, includes a number of reproductions of the old masters, the younger Mr. Hollyer having made a special study of the works of Botticelli, and of other masterpieces in Florence and at The Hague. We think the reproduction of Botticelli's "La Primavera" is superior to anything of the sort to be obtained in Italy; due, no doubt, to the individuality of the English photographer compared with the necessarily somewhat mechanical reproductions of the large Italian forms of photography. Individuality is admittedly a dangerous recommendation to a copyist, but the best results are missed by those who do not possess the faculty of sympathy and the perception to guide them to attain the desired effect. One of the most interesting features of the exhibition is the collection of portraits from the life or from paintings of those eminent in science, art, and letters of modern times. Names like Carlyle, Paderewski, R. L. Stevenson, Burne-Jones, Leighton, Bismarck, Cowper, Dickens, Ruskin, Henley, Watts, Joachim, William Watson, Tennyson, Browning, William Morris, Pusey, Miss Mitford, Rossetti, Scott, Matthew Arnold, Thackeray, Gordon, Father Damien, and Huxley, are sure to attract attention, and we should like to see them collected together and placed in security in some public institution. We can imagine no more suitable decoration for the walls of our homes—when original works are out of the question—than reproductions of some of the inspiring works of our greatest living painter, Watts, or of the great artists of the past.

The London Institution.

AT the London Institution on Monday a lecture on "City Buildings, Old and New," was delivered by Mr. C. H. Reilly. With the aid of well-selected lantern-slides Mr. Reilly gave a brief picture of the aspect of Mediæval London, and drew comparisons between it and London streets as we now know them. Wren's scheme for the rebuilding of the City was noticed in considerable detail. He rightly bemoaned the architectural disadvantages under which modern building schemes are conducted, which are mainly responsible for the debased state of most of our street architecture—so poisonous to the eye of the untutored public. A knowledge of the simple principles of construction is within the reach of every man, and be he artist or not, he is able to appreciate a sound structure. A few slides of recently-executed City buildings were shown to illustrate the absolutely unprincipled nature of their designs, and with them was compared the City work of our best modern architects.

Decorations for the Coronation.

THE Fine Art Society have issued a circular stating that they are prepared to advise in regard to the artistic decoration and illumination of public buildings, streets, and houses on the occasion of the King's Coronation. They say, very truly, that "decorations of this nature have hitherto proved most unsatisfactory, and energy, time, and money devoted to them have, through lack of artistic supervision, been wasted upon commonplace and monotonous displays." They announce that they have secured the assistance of two well-known decorative artists (names not given), who have organised a staff of artist designers, and they are prepared to advise and give designs. We should have liked it better if the names of the artists had been given. We have little doubt that the Society will be able to improve on the ordinary style of street decoration, but the whole announcement is rather too much in the style of a trading firm with an eye to "business."

Royal Academy.

THIS year the sending-in day for architectural drawings, as well as black and white drawings, engravings, etchings, &c., will be Thursday, March 27; for oil paintings, Saturday, March 29, and Tuesday, April 1; and for sculpture, Wednesday, April 2. We presume that models intended for the architectural room will, for receiving purposes, be classed as sculpture.

ACCIDENTS ON BUILDINGS.—The Factory Department of the Home Office have sent round to builders a reprint, with some additions and modifications of a report which appeared in the Annual Report of the Chief Inspector of Factories for 1900, in regard to the best means of guarding against accidents in building operations. The modifications introduced have been made upon the suggestion of leading experts who have been consulted. We may have more to say on the subject on another occasion.

THE ROYAL INSTITUTE OF ARCHITECTS.

The sixth general meeting (business and ordinary) of the Royal Institute of British Architects for the present session was held on Monday at No. 9, Conduit-street, Regent-street. Mr. John Slater, B.A.Lond., Vice-President, in the chair.

The minutes of last meeting having been taken as read,

Mr. W. J. Locke, Secretary, announced the decease of Mr. W. G. Penty, Fellow, of York, a past President of the York Society.

Elections.

THE following applicants, found by the Council to be eligible and qualified according to the Charter and By-laws, were then elected:—*As Fellows:* Messrs. J. Parker, Cape Town; A. N. Prentice, London; J. R. Moore-Smith, London; and F. H. Tulloch, Belfast. *As Associates:* Messrs. C. T. Adshead, Liverpool; S. W. Bensted, London; E. G. Besant, Cambridge; A. B. Botterill, Streatham, S.W.; C. A. Broadhead, Nottingham; D. J. Brundrit, Ulverston; H. Busbridge, Plumstead; R. S. Cockrill, Great Yarmouth; W. J. Devlin, London; W. E. Dobson, London; J. Ewing, London; E. L. Gaunt, Bradford; A. E. Gibbins, London; F. R. Boyd Haward, London; R. E. Hemingway, Nottingham; A. E. Hughes, London; A. T. Hussell, Ilfracombe; E. W. Lees, London; E. Berks Norris, Birmingham; L. Rycroft Oakes, London; H. F. Ponton, London; C. E. Power, London; W. Beddoe Rees, Cardiff; C. H. Reilly, M.A. Cantab., London; E. G. Rodway, Bristol; A. Sharp, Montreal; G. L. T. Sharp, Barnes Common; W. Slater, Nottingham; F. Danby Smith, London; W. S. Tucker, Exning, Newmarket; A. H. Verstage, Godalming; E. P. Wheeler, London; J. A. Woore, Derby; E. L. Wratten, Croydon, Surrey.

The Royal Gold Medallist.

The Chairman said he had to announce that the Council proposed to submit to his Majesty the King, as a fit person to receive the Royal Gold Medal for 1902, the name of Mr. J. F. Bentley, for his work as an architect.

The announcement was received with much applause.

Address to Students.

The Chairman said that he should like to explain how it was that he was about to read an address to students instead of their President, Mr. Wm. Emerson. The President had been on a visit to India, and he had had no time before he went away, or while he was away, in which to prepare the address, and for that reason the duty of preparing the address had fallen upon him instead of the President.

The Chairman then read the following address to students:—

"The architectural student of to-day, if he takes an intelligent interest in the history of his art, must be much impressed and somewhat puzzled to notice how very fluctuating and short-lived have been the various fashions of architectural taste during the last hundred years or so. If he looks to ancient times, when the world was young, and what Lord Leighton calls 'the spirit of spontaneous, unquestioning joy in production' was paramount, this was not the case. The styles of architecture which the early building peoples evolved for themselves to suit the vicissitudes of climate, the varying necessities of their public and private life, the nature of the building materials found in the country, and various other local conditions—whether you turn to Egypt with its colossal and gloomy avenues of sphinxes and columns, or to Assyria with its glazed-tile decorations and mural tablets depicting in realistic fashion all the daily occupations of its kings, or to Persia with its lofty tapering columns and pillared halls such as we see at Persepolis—these styles, I say, persisted with slight variations for centuries, and only died with the decay of the nations themselves. When we come to Greece, we know that at the beginning of the sixth century B.C. the splendid temples of Artemis at Ephesus and of Here at Samos were commenced, and we can only imagine what a length of time must have elapsed from the erection of the earlier and simpler Doric temples before these two magnificent buildings could have been possible. The Doric and the Ionic styles flourished contemporaneously, and the latter merged into the Corinthian, the

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earliest example of which is the Choragic monument of Lysicrates, which was built in B.C. 335. When the Greeks began to plant colonies along the Italian littoral, numerous temples sprang up there, and the Romans became familiar with Greek architecture, which they naturally adopted, with modifications and variations; and this variant of the Classic style prevailed during the continuance of the Roman Republic and under the Emperors, not only in Rome itself, but in the numerous colonies which she founded, and the ruins of the Roman edifices served as the pattern for the debased Classic buildings which were erected during the earlier centuries of the Christian era. Passing through the Romanesque, we find Pointed or Gothic architecture fully developed in England and on the Continent, except in Italy, where the Classic traditions lingered longest, by the end of the twelfth or the beginning of the thirteenth century, and from then down to the middle of the sixteenth century this style, with its developments and modifications, held the field until the Revival of Letters led to that Rennaissance of Classic taste which stamped its mark on the architecture, the literature, and the painting of the next two hundred years. Since then all has been changed. In 1830 Quatremère de Quincy published his work on the lives of the most celebrated architects, and he uses these words in his introduction :—'As we only recognise as the true architectural art that which—alone among all known methods of building—owes its origin, its progress, its principles, its laws, its theory, and its practice to the Greeks, and which, handed on by the Romans, has become that of the greater part of the civilised world, we must forewarn our readers that no mention will be found in our treatise of any work or of any architect of the kind called Gothic.'

In 1827 was published a work illustrating the recent buildings erected in Regent-street, and on the outskirts of Regent's Park, and speaking in terms of no unstinted praise of the excellence of the designs. Yet in 1836, when the Houses of Parliament were in course of erection, we find the Gothic style to the fore. In 1867 the competitive designs for the new Law Courts were sent in, to the number of eleven; every one of these—except one alternative design submitted by Mr. Garland—was in the Gothic style, and Mr. (afterwards Sir) Gilbert Scott, in his report, claimed for the Gothic style that it afforded the greatest facilities for the developments suggested by modern requirements, modern materials, and modern modes of construction. A generation later what do we find? You are all of you acquainted with the storm which was raised a few weeks ago anent the Liverpool Cathedral competition, and I need not quote the opinion of a distinguished modern architect as to the competency of the Gothic style to meet the requirements of to-day! Now I think it very probable that all this may lead an architectural student to exclaim, 'A plague on both your houses! Why should I bother my head with learning anything about Classic or Gothic, Romanesque or Renaissance? All art is ephemeral, utilitarianism is the only guide. These styles are now all dead, and will give me no help towards designing a town hall, an infirmary, or a modern residence.' Now I do not think it can be too strongly impressed on those who may be disposed to hold such views that they will be utterly wrong if they take this line. What is it that stirs the emotions even of the unlettered man when he gazes down a vista of columns, gigantic and awe-inspiring, in an old Egyptian temple, or looks upon the perfect grace of the Parthenon, or the stupendous relics of mighty Rome, until, as Byron says,

> the place
> Becomes religion, and the heart runs o'er
> With silent worship of the great of old;

or when in some old mediæval cathedral where

> The blessed saints are smiling dumb
> From the rich painted windows of the choir
> On aisle and transept,

he looks up to the springing arches and intricate ribbed vaulting—what, I say, stirs the emotions but the feeling that, different as may be the forms which present themselves, there is such fitness in the purposes of each and in the connexions of all the parts with each other, such perfection in the combination of form and colour, that the net result in every case is beauty. And if this emotion is excited in the untutored breast, even though it may fail to find expression, is it not more so in that of the artist, and ought he not to study reverently and carefully the older styles, not with the idea of slavishly imitating them, but with the desire to enter into their spirit, to see what were the aims with which the old masters of the building craft worked, and upon what the beauty of the result depends? The buildings which have attracted and which will attract the most universal admiration are not those at the sight of which we exclaim 'How enormous' or 'How wonderfully clever,' but those which are beautiful; and whenever you meet with a building, large or small, new or old, which attracts you as being beautiful, study it carefully, not in the mechanical spirit of the anatomist who is dissecting a dead body, but with wise and loving sympathy and reverent tenderness. I am old-fashioned enough to think that an architect ought to try to make his building beautiful, and that a protest should be made against what appears to me to be the cult of ugliness which has been growing of late years. There is too great a tendency nowadays to mere eccentricity and originality among the younger men. There have been several buildings erected lately the cleverness — I had almost said the infernal cleverness — of which cannot be denied for one moment; but are they beautiful? There is far too much straining after effect, too great eagerness to achieve something not attempted, or, at any rate, not achieved, before; and, as has been well said, 'when the achievement becomes obvious, is it not by way of becoming uninteresting?' I am not arguing in favour of a dead level of monotony which is uninteresting, even if the level be a high one; I have no love for the stereotyped style of art which the continental methods of education and study too often result in. If a man be a true artist his individual emotions, the bent of his mind, all the idiosyncracies of his character, are bound to come out in his work; but do not let your main idea and aim be to display your idiosyncracies. In this connexion I cannot do better than quote some words recently used by Sir Edward Poynter in addressing the students of the Academy. He said, 'The desire to be original is a constant besetment of the young artist, but unless founded on a solid base of knowledge and study it is apt to lead to mere eccentricity, and to show a desire to astonish rather than to command that legitimate admiration which sensible people would give to all well-considered and thoughtful work; and there is perhaps nothing more distressing to the intelligent observer of a work of art than an evidence of the desire to be original at all costs, where there is neither genius nor knowledge to support it.' These words cannot be too closely pondered on and taken to heart by every artist, and especially by architects to-day, who are too apt to think that the rays which fall from the new electric lamp of eccentricity have extinguished all the beams of the old seven lamps. A real genius may be original because he has the knowledge and the power to work out his original ideas, but what can be more contemptible than to see the weak, jejune and spiritless attempts to copy what may be admired as an original work of genius, while the copy only shows the lack of genius in its exponent? In literature we admire Carlyle because of the intense earnestness which is everywhere to be found behind the rough and somewhat uncouth language which he employs; but of those who have tried to imitate Carlyle what shall we say? 'Non ragionam di lor, ma guarda e passa.' Your buildings are the vernacular in which you have to express the architectural ideas which are in you, and depend upon it the simpler and more direct that language is, the more eloquently will it appeal to the world. Be assured, therefore, that the time you may spend in studying old work will never be wasted, that such study will but brace your pinions and fit you better to soar into the heights which science is opening out for you. And further, the study of old work will teach you another most important lesson—never to lose sight of the nature of the material in which you are working. In the best old work the material is never tortured: one form of ornamentation and enrichment is suitable for stone, another for brick, and another for wood; and this has always been lost sight of when art became debased, with the result that a mere *tour de force* is attained from which, however much we may admire the skill which produced it, we turn with relief to the simpler, truer, and more legitimate methods of treatment.

Before I leave the subject of what I may call your intellectual equipment for the career which you have chosen, let me urge you to cultivate an easy, terse, and direct literary style. When you get into practice you will have to write reports and to carry on daily correspondence on all sorts of subjects, and you should endeavour always to make your own meaning as clear as possible to those you are addressing. It often occurs to me how lamentably deficient in literary style are the majority of letters which one gets from architects. And here I cannot but express my regret, which is shared, I believe, by all members of the Council, that we have been unable to award the Essay Prize this year. Here is an opportunity, which I should like to see more widely embraced, of carefully studying some subject given to you, digesting it, and then producing in your own words a dissertation on the subject, which should not be a mere *réchauffé* of what you have read, but an attempt to explain and to reason upon the theme which has been set you. I hope next year we shall get a much larger number of competitors for this prize. Also I would urge the younger members of this Institute not to neglect any opportunities you may have to practice public speaking. If any subject is treated in this room on which you have knowledge, I am confident your attempts to impart it will always be received sympathetically by the occupier of this chair, whoever he may be, and you will find it an enormous advantage to be able to express your ideas in public. I very much wish more of the younger men would take part in our discussions here.

When you once get started in independent practice there will be hosts of matters coming before you on which you will only have your own judgment to guide you. You are sure to make some mistakes, but do not be unduly discouraged by them; you will learn more from mistakes than in any other way. I must just say one word on what has been a vexed question ever since I took any interest in this Institute—I mean competitions. Whatever may be one's personal views on competitions, I do not for one moment suppose we shall ever get rid of them. From the point of view of the promoters, I do not think the best method of getting the most suitable design is by competition, because, however carefully you may draw your conditions, you can never embody in them all the small points which ought to be and would be considered by the designer if he were in constant touch with those whose requirements he is trying to meet; but from the competitor's point of view—painful as must be the aggregate waste of time and energy—it seems to me that there was a great deal of force in the remarks made by Mr. Wills a few weeks ago in this room. He said that a man starting in practice cannot possibly have his time fully occupied, and that he had better waste his time going in for competitions than in other ways, and there is no doubt you may learn a great deal by endeavouring to work out actual problems of design; but you ought to work them out conscientiously, and not slur over the difficulties, or you will be apt to get into slovenly ways of work, and there is always the danger of being led to put telling bits of design into the elevations without looking after the construction. And if you do go in for competitions, when the award is made I cannot help thinking the losers would best consult their own dignity by accepting their defeats in silence. Of course, I am assuming a conscientious assessor and promoters who mean loyally to accept his award. No words can be too strong to stigmatise cases in which assessors' awards are upset for no intelligible reason except gross nepotism; but I hope such cases are growing rarer, and this Institute is, I feel sure, always desirous of doing its best to keep competitions clean, fair, and above-board.

The field of an architect's practice is ever widening, and, in fact, it is now so extensive as almost to deter men from entering on it. All the new discoveries of science, which at first are simply laboratory experiments, are gradually made to subserve our daily needs and requirements, and as soon as this has taken place our clients expect us to advise them with reference to all new inventions, and you will find it to your great advantage to keep *au courant* with the times by noting and, if possible, investigating the utility of new inventions affecting architecture. But the powers of any individual are limited, and I feel sure that the near future will see

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a good deal of devolution of the manifold duties undertaken by architects. And I see no reason why this should turn out to the detriment of the architect. On the art side he can be associated with the sculptor, the painter, and the mosaic worker, and on the scientific side why not with the engineer? Quite recently this Institute urged the desirability of associating an architect with an engineer in bridge design, and I am confident it would often be desirable to associate a professional civil engineer with an architect in the case of large buildings where difficult problems of support or construction have to be considered, the best arrangement of electric wiring, and so forth. I would be the last to undervalue the great assistance which an architect receives from what I may call the specialist manufacturers with whom we so frequently have to consult, but personally I am disposed to think the better plan would be to put their work under the direct supervision of a professional engineer, who could draw up the specification embodying the conditions under which the work is to be carried out. But this is a question which scarcely comes within the limits of an address to students. The very wideness of the field covered by an architect's practice, with all its manifold responsibilities, has, however, its compensations. As your practice increases you need never be haunted by the dread of monotony. Your work will probably take you afield into various parts of the country, and every fresh building which you have to design will present new difficulties as to site, aspect, accommodation, &c., which it is a never-ending pleasure to try to overcome. Architecture is so many-faceted, and touches so many planes of modern life—ecclesiastical, municipal, commercial, and social—that an architect ought above all other men to be broad-minded and to avoid anything like cliqueism or a haughty bearing towards his fellows. Remember that, however fascinating and lofty may be your designs, the effect of your buildings when finished depends not upon yourself but upon the builder who carries out your designs, the foreman who looks after the work, and even the individual carpenter who fits a moulding or the labourer who mixes the concrete, and if you cultivate broad sympathies you will find all through your life that you will remain a student, and will be learning lessons every day, and this will tend to keep your brain clear and your mind receptive.

In these few remarks I have endeavoured merely to touch upon some of the matters of interest to students as to which a word of advice or caution may be useful, but you must fill in the details yourselves, always remembering that so honourable and inspiring a profession demands that those who practise it should always uphold a high standard of honour among themselves.

In conclusion, let me heartily congratulate those of you who have come here to-night to receive the prizes which you have so thoroughly deserved. Mr. Hare will give you some detailed criticisms on the work which has been submitted, and I will only say that I think the collection of drawings which has been on view the last fortnight is a really remarkable one, and shows an aggregate of labour, study, and skill which cannot be too highly commended. And you who have not been fortunate enough to win prizes are also to be congratulated, for you have shown a steady perseverance in working out your designs which will certainly not turn out to be lost labour, and you will learn a great deal by observing how others have got over the difficulties which perplexed you. Do not be unduly depressed by your failures nor elated by your successes, but let each only stimulate you to further endeavours. I heartily wish you all possible success in your future careers."

Notes on Students' Designs.

Mr. H. T. Hare then read a criticism of the designs and drawings submitted for the prizes and studentships, 1901-1902. He said that one could not, in looking round the exhibition, fail to be struck by the vast amount of care and labour which the students who were competing had expended on their work, and the critic should weigh well his words that he might not on the one hand omit any beneficial criticism, or on the other discourage or misunderstand an earnest and meritorious worker. It was also to be borne in mind that the designs were the work of students and must not therefore be judged with too great severity from a practical standpoint. The subjects included in the prize list of the Institute covered a very wide field, ranging from the literary side, as instanced by the essay, to the eminently practical, as evidenced by the Grissell Medal. The study of old work was encouraged in the competitions for the Pugin Studentship and the Institute Medal, of colour in that for the Owen Jones Prize, while design, the ultimate end and aim of all these studies, was invited in the subjects given for the Soane Medallion and the Tite Prize. Any student who had taken, year by year, one of these subjects would, he ventured to think, when the list was exhausted, have passed through a course of study which would be of infinite value to him in after years, and would equip him with a fund of knowledge which would stand him in good stead in the stress of practice, when little time or opportunity was left for theoretical study. The standard of work submitted had always been a high one, the prize designs and drawings usually being among the most notable published during the year, and this occasion formed no exception. Except in one or two particulars he thought the work might bear comparison with the best of former years; indeed, some of it seemed to be a step in advance. In regard to the Soane Medallion, it was gratifying to be able to say that the quality of many of the designs (for a large swimming-bath) was much higher than last year, when the Council felt compelled to withhold the medal; but this year there were several designs, any one of which might have received the award. The site given being an open one, untrammelled by any restrictions, it was curious to note that out of the sixteen competitors no fewer than twelve should have preferred to arrange their main frontage and entrance at one end, the remaining four only utilising the side, the length of which he should have thought would offer the most architectural possibilities. The end frontage and entrance had tempted many competitors to duplicate the accessory rooms asked for in order to balance the grouping, a licence which was hardly contemplated and was barely legitimate. It was never intended that the schedule of accommodation should be strictly and rigidly adhered to, but it should not be necessary to materially vary it in order to produce a satisfactory design. These remarks applied with the greatest force to the prize design, that submitted by Mr. Fulton under the motto "Iona"; indeed, to such an extent had he exceeded the prescribed limits, that the selection of his design was seriously jeopardised on that ground alone, and it was only owing to its undoubted superiority in other respects that it received the award. This design was an extremely fine one from the architectural point of view, exhaustively thought out in every detail, brilliant in draughtsmanship, and though a little wanting in some respects in reticence and inclined to be overdone, still, taken all in all, a masterly composition, reflecting the greatest credit on its author.

Mr. Hare then briefly referred to some of the other designs in the competition. Proceeding he said that several competitors did not appear to have realised that the treatment was intended to be architectural, and had regarded the problem as one to be solved by engineering rather than architecture, a mistake which ought not to be possible, for the one should comprise and be necessary to the other. Few of the authors had successfully grappled with the difficulty of the dressing-boxes, which ought not to have been impossible of treatment if not regarded from a too practical standpoint. The chimney-stack had also proved a serious stumbling-block, and not a single author had attempted the solution by twin towers, which, in a Classical or Renaissance design, would, he thought, have been a legitimate treatment. It was also difficult to see why so few of the best designs had introduced lighting from the roof, which was almost an essential in a swimming-bath, and was surely not beyond the wit of man to compass without much sacrifice of appearance. One noticed, with some interest, that the most successful designs were those which had drawn their inspiration from the baths of Caracalla, a motive which bid fair to prove a sort of universal recipe for many of our problems, from a cathedral downwards, and one was fain to admit that a worse model might have been selected.

The drawings for the Tite Prize were this year disappointing, as, though the number of designs submitted was large, there was no single one among them which unmistakably excelled; indeed, he might say that there was not one which could be regarded as quite satisfactory. The subject—a Royal mausoleum—was a purely architectural one, calling for the highest development of the art, and the conditions supplied a plan which was one of Palladio's unworked-out sketches. Competitors were thus at liberty to devote the whole of their thought and study to the architectural treatment of the subject, and it was fully expected that at least one or two very fine designs would have been elicited, especially as so much attention was at present being devoted to Italian architecture. The Tite bequest was made with a view to promoting the study of Italian architecture, and by that time should be understood the architecture of Palladio and his contemporaries and followers. This did not appear to be clearly realised by many of the competitors, and year by year the Council were compelled to pass over a number of very excellent designs because they did not fulfil this essential condition. The design which received the award this year, "Lion Heart," by Mr. C. Gascoyne, might be said to owe its position rather to negative than positive merit. While it failed in dignity and impressiveness, it was the design against which the fewest objections could be urged on a careful examination of its details. The dome could not, however, be said to be strictly Italian, and its outline was not very pleasing, and the entrance portico or porch was open to criticism for the manner in which the columns were introduced on each side of a narrow rusticated pilaster. The drawings were well thought out, and the design of the interior was satisfactory.

Mr. Hare then referred to several other designs in the Tite competition. Proceeding, he said that the Grissell Medal had this year attracted six competitors, the design being for the roof over a picture gallery. The competition being for construction only, one did not necessarily look for exceptional merit in an artistic sense. It was, however, interesting to find that the best design constructionally was generally also the best artistically, which tended to show that the practical mind could sometimes descend to consider the pleasing of the eye. Or should he reverse the remark? Of the six designs two only had adopted what was generally accepted as the most satisfactory method of lighting; that was by continuous skylights along each side, leaving the central portion solid—a rather difficult method to treat successfully. The selected design, by Mr. L. U. Grace, was shown in a set of careful drawings, which would no doubt result satisfactorily in execution. On the whole, all the designs reached a high level of merit. Turning now to those competitions which did not involve design, but which were devoted to the study of old buildings, he was pleased to note that excellent work was again submitted by all competitors. "There is evidence of an amount of enthusiasm and love of their art which leads us to look forward hopefully to the future at the hands of those who will shortly be entering upon active practice." Speaking of the competition for the Silver Medal, he said it was one of the most valuable of the series, in that it ensured the careful measurement and delineation of interesting old buildings, thus forming a permanent record which might become of great importance in the future, when the originals should have succumbed to the hands of the vandal or the ravages of time. For the student, too, there was no work which could give so thorough an insight into the details and methods of the masters of the past, as the actual measuring and plotting of the buildings. Sketching was good, but measuring was better. The interest in the Owen Jones Studentship was fully maintained this year. Whether the colouring was not in some cases formed rather by a desire to produce a pictorial than a truthful effect was open to serious question. He supposed colour was a thing which no two people saw alike. He was also struck by the fact that the large majority of the studies were of mosaic, Della Robbia, and kindred materials, and that there were practically no drawings of painted decoration, which would probably be of much more practical service. A vast amount of labour had been expended in showing minutely each separate tessera of a floor or roof, and while one could not but admire the patience and care devoted to the work, it was impossible to avoid a feel-

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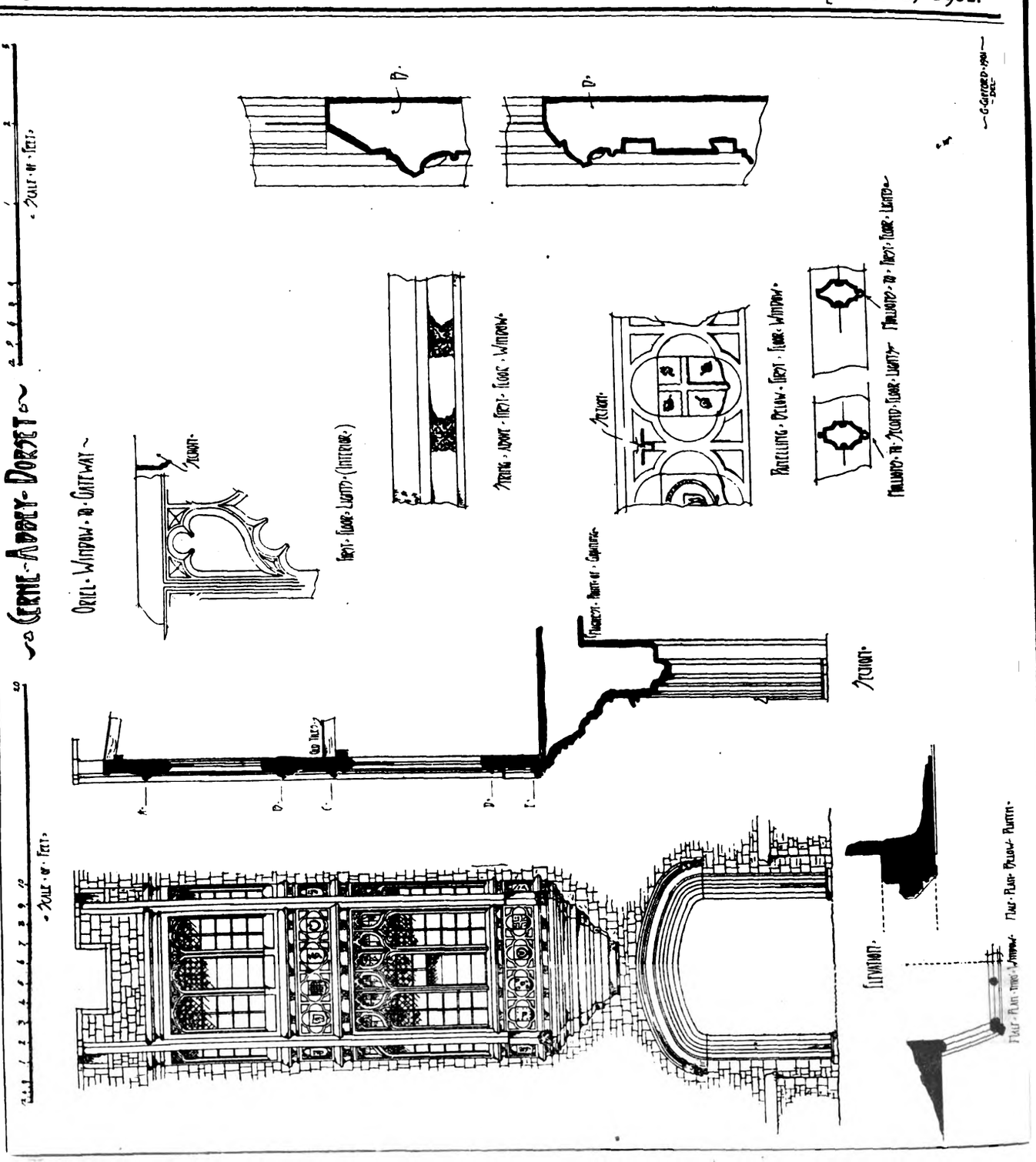

ing that some of this energy might have been better employed.

The Chairman then delivered the prizes and studentships. For a full list of the successful competitors see our issue for January 25, p. 78.

Sir Lawrence Alma-Tadema, R.A., proposed a hearty vote of thanks to the chairman and Mr. Hare for their admirable addresses. The vexed question in architecture nowadays of whether there is any style or too many styles, proved that art was but tradition. Art was based on what had been taught us by our fathers and mothers, and it was only beautiful when it was human, and when it was human it was never without sentiment. We must therefore graft upon the trunk of tradition the sentiment that fed us. And we must not judge modern work too acutely, for we were too much in the midst of it to form a correct judgment.

Mr. J. J. Burnet, A.R.S.A., President of the Glasgow Institute of Architects, seconded the vote of thanks. Perhaps one way to forget style was to sink ourselves in human needs, for that, after all, was the basis of all architectural expression. Refinement of mind and thought was to be used quite unconsciously in the service of our fellow-men, and when that was so there was no room to think of style at all; the first duty would seem to be to make their buildings meet the necessities.

The vote of thanks having been agreed to,

The Chairman briefly replied for himself and Mr. Hare and announced that the next meeting would be held on the 17th inst., when Mr. F. W. Bedford will read a paper on "Baldassare Peruzzi."

The meeting then terminated.

The annual dinner of the Institute will be held on Thursday, June 19, at the Whitehall Rooms, Hôtel Métropole.

THE ABBEY GATE-HOUSE, CERNE ABBAS, DORSET.

THE now melancholy and perishing townlet of Cerne Abbas (in Domesday Book "Cernel," or "Cerneli"), about eight miles north from Dorchester, traces its ruin, like so many similar places, to the suppression of the Abbey in its midst; which was unhappily followed by the destruction of most of the conventual buildings. The drawing here given represents the chief fragment which remains standing.

The only relics of the Abbey Church itself are some broken mouldings lying in a farmhouse garden, portion of an altar-piece built up in a cottage wall, and some trefoiled work of almost Greek delicacy, now fixed over the churchyard doorway. From these fragments it appears that the church must have been much earlier in date than the gateway, and withal a beautiful example of the purest geometrical Decorated style. Not one stone of it now remains upon another, and those visitors to the lonely spot who care to attempt a mediæval problem may sit and conjecture from the position of the Abbey House, and the few other walls still erect, whereabouts could have been situate the church and cloisters—not an easy question to decide. The site is a cunningly chosen one in an attractive vale, and the buildings, when at their best, must have been among the fairest sights of Merrie England—fronted by fish-ponds, backed by vineyards (according to tradition), and by the lofty, green "Giant's Hill."

Some archæologists have doubted if the gateway could have been wide enough for the chief entrance to the Abbey; and have supposed it the entrance to the Abbots' house. Its picturesque surroundings make it a favourite subject for sketchers, but so far as we are aware no drawing of it to scale is accessible. The present one is by Mr. G. Gifford, of the office of Sir A. W. Blomfield & Sons, from measurements taken by him on the spot. The drawing was sent to us by Mr. Thomas Hardy, the eminent novelist, who lives in the neighbourhood and takes a great interest in its antiquities, and we have much pleasure in publishing it at his request

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THE ARCHITECTURAL ASSOCIATION.

AN ordinary fortnightly meeting of this Association was held on Friday last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, Mr. W. H. Seth-Smith, President, in the chair.

The minutes were read and confirmed, and the following gentlemen were elected members of the Association:—Messrs. H. H. Christie, A. L. W. Sampson, and R. J. Wilkinson.

Mr. H. P. G. Maule, Hon. Secretary, announced that the second spring visit would take place on February 15 to the Victoria and Albert Museum, by permission of Mr. Aston Webb.

New Premises Fund.

The Chairman announced the following additional donations to the New Premises Fund, *i.e.*, the Worshipful Company of Merchant Taylors, 105*l.*; and Messrs. M. Garbutt, 10*l.* 10s.; A. T. Walmisley, 5*l.* 5s.; C. B. Arding, 5*l.* 5s.; E. H. Parkes, 2*l.* 2s.; A. H. Ryan-Tenison, 2*l.* 2s.; an "A. A. Student," 1*l.* 16s. 6d. (the result of passing the hat round); W. E. Hewitt, 1*l.* 1s.; V. Wilkins, 1*l.* 1s.; and D. A. Forster, 1*l.* The total amount received or promised is now 3,702*l.* 14s. 6d.

The Chairman said he had heard disappointment expressed that the amount was not larger, but seeing that the Christmas recess had occurred since the appeal for donations to the fund was first made, he thought the result was very satisfactory.

It was announced that a meeting of the Discussion Section would take place on the 7th inst., when Mr. J. Dudley Forsyth would read a paper on "Stained Glass."

The Chairman announced the commencement of the following classes, *i.e.*, "Perspective," February 12, Mr. W. G. B. Lewis lecturer; "Ventilation, Lighting, and Heating," February 13, Mr. Max Clarke lecturer.

"Originality" in Architectural Design.

Mr. C. Harrison Townsend then read the following paper:—

I deplore the inefficiency of the presentment of to-night's subject, the more that I feel it to be quite one of the most important that you could meet to consider. For it does not propose to add to minds, perhaps already largely stored, another item or series of items of knowledge, but it offers for consideration what to do with the sum total of all the learning you have up to now acquired, and will in the future acquire. And it suggests the subjection of the isolated facts of learning to a synthesis that shall resolve them into one organic whole.

Lectures on styles, papers on materials, demonstrations on methods, these and the daily experiences of your work, all help to fill your minds with the data of certain indispensable knowledge. Yet even profiting to the full by these opportunities, and bringing to them even the most unflagging industry and the most retentive of memories, you are then face to face with the question of how to get the most complete outcome from this mental equipment. And the doubt arises whether a store of facts and a mass of knowledge are all that go to the making of an architect. Does the fact that you are—even generously and widely—educated, that you have at your fingertips any amount of knowledge of materials and construction, and that you possess a full acquaintance with the historical remains of architecture handed down to us from other days—does all this do more than make you *ready to be* an architect? Does it, as a matter of fact, constitute you one in the proper sense of the word? And, unless something breathes these dry bones of knowledge and tradition into life, is their possessor more than a skilful "practitioner"—a thoughtful and cultivated "professional man?"

I am here by no means raising the tattered banner on which is inscribed the wearying question, "Is architecture an Art or a Profession?" I care little whether it be an art, or a profession, or, for the matter of that, a trade. Whichever we term it, however, a man's fitness to be and claim to call himself an architect are not to be estimated and gauged by the measuring-standard of what he has learnt. It is not by what he knows, but by what he does with what he knows that he shall be judged. It is for him to throw into the crucible of his own nature all his learning and all his knowledge, there to be fused and made one, and out of that melting-pot to draw an ingot that is to be stamped and shaped as his own personality, his own individualism shall determine. As Marcus Aurelius says, "Is it not a grievous thing that an architect shall respect the course and mysteries of his profession more than the proper course and condition of his own nature?" That is to say, that too great a regard for that course and those mysteries, or, to put it otherwise, the attachment of undue importance to formulæ and rules causes a positive atrophy of the imaginative and creative faculty, by which an artist—the architect as well as the painter and sculptor—should claim to be appraised.

"To follow foolish precedents, and wink
With both our eyes, is easier than to think."

Yet precedents and traditions must need exist and endure in every art, and it would be presumptuous to claim to be in art absolutely free, and to have shaped oneself rather than to have been made by the great thoughts and the great men that were of old time before us. There is no logical standpoint for him who disclaims and disavows all reference to, all dependence upon, all reverence for the past, and whose ideal is the substitution of his own ignorant lawlessness, for the lessons handed down to him from other times. Such a one, I imagine, would, without remonstrance, accept and adopt the term "anti-historical" applied the other day in one of our weekly papers to express the aims in art of one of those architects whose views I am trying to put before you to-night, and could not consistently rejoin that he claimed to be individual in expression—*not* original and creative. Nor could he further maintain, as that criticised architect would, that he was in fact *more* truly historical and following *more* closely along the lines of architectural evolution than the many mimics of the forms into which architects of distant countries, or of bygone days, have cast their thoughts and their ideals.

Here, let me ask, is there justification for alleging that any—or, at all events, let me say that any considerable number of—architects have in set terms foresworn allegiance to tradition, and have claimed the right to apply the word "original" to their works? I think not. Individual in method of expression, yes; non-resurrectionists of long-since dead and buried styles, yes; haters of mimicry of earlier forms that were expressions of earlier wants and needs, again, yes. I know those who are glad to come under those categories, and I venture to think that in their hands lies the future of our art.

Yet remember, that in thus doing your best to make your architecture speak To-day rather than the Past, you are not to strive, of set purpose, to be what you or others may call "original." As Lowell says in one of his letters, "When a man *aims at* originality, he acknowledges himself unoriginal." You will find it both grand ideal and hard task enough to try to let your work reflect you yourself, and to give it a personal and individual character. If it thus bears your own impress what more "originality" need it have or can it have?

But this quality must come of itself; it must result not from the attempt to do what other men have never yet done, but from your wish to shape your work *so* because it seems to you the best solution of the problem before you. And, having worked out this—your own—solution you neither adopt nor, on the other hand, repudiate it, because others have arrived at this result before you.

We have in architecture, as I have said above, a speaking living tongue, and if the thick mists of custom and conventions allowed us to see it, nothing can be more illogical than for us of to-day to borrow the language of Byzantium or Florence, or Amsterdam, in which to give our message in this Year of Grace 1902, or to rely upon a thirteenth or fourteenth century vocabulary as a means of expressing architecturally our own religious needs and aspirations. While our language, as we now read or speak it, comes to us enriched by that of other days, it yet has the distinct stamp and impress of its time, and to express our wants, or tell our tale, one to another, we do not, in book or conversation, deliberately adopt the spelling or the speech of Chaucer, or of John Florio, or even of Addison.

Yet is not this precisely what we do in architecture? Is not the measure of praise bestowed upon a modern building in exact proportion to the faithfulness with which its designer has worked on the lines of other times—Mediæval, Elizabethan, Georgian, or what not; or to the closeness with which he has imitated the architecture of, I know not what country—Holland, Italy, or France? Is a man ashamed, as he should be, when he is told that his building (*his*, mind you, finished to-day or yesterday, in 1902, in 1901) is "so faultlessly Elizabethan that it might well be taken for an old building of that date?" Does he feel insulted, as he should, when he is assured that "in general design as in every detail his church is conceived and worked out in a thirteenth-century style?"

I know it will here be said that there are less extreme cases than these, and I shall be reminded that there exists that vaguely qualifying phrase, "a free treatment" of such-and-such a style, which is supposed to represent a saving grace, and to oblige us to approve a design, which is not, like those others, all copyism, but one with, say, 75 per cent. of imitation and 25 per cent. of "free treatment." This seems to me to be a distinct concession towards the point of view I am speaking of, and even this modicum of freedom is to be welcomed, and we ought to be thankful for, at any rate, such proportions as I have suggested. Yet these might conceivably be reversed if the architect's mental attitude when face to face with a problem of design, were different to—and, as I think, more logical than—the usual one, and one might then hope to find, let us say, 75 per cent. of spontaneous individual personal feeling in the design, and the 25 per cent. residue, if it did happen to be reminiscent of other and preceding work, would not, at all events, be so because of an avowed desire to recognise closeness to the designs of earlier men as the ideal towards which one should strive.

An architect may (and I am, as I have said before, glad to say he usually does) tone down the rigid exactitude of a sheer copy by more or less admixture of his "free treatment." But how often does he not sit down at his drawing-table with the acknowledged intention of producing a "Gothic design"—a "Renaissance design" (both of them with—or without—that wonderful "free treatment")—or, indeed, as it sometimes happens to-day, a design in which all architectural graces are to be laboriously and effectually omitted altogether? And selecting from a well-stored memory—I refrain from suggesting dependence upon Kodak, or reference to sketch-book—a certain form, or fashion, or style, does he not proceed to clothe his building with the particular material his mental pattern-book suggests, and to rely for his design more upon the achievements of the past, than upon his own invention, and his own imagination of the present?

I have said more than once he may refer to and ask the past to help him to a solution; he must not depend on it to find him that solution.

In literature, a few years ago, we were all keenly touched to hear an American critic of much note tell us that "all the tales have been told." He was more wrong than even most makers of epigram, and we felt that while men and women are, and while lives are happy—or are sad, and while hopes are hoped—or frustrated, and while hearts are blithe—or breaking, there are still at each turn, and every moment, tales, comic and tragic both, unwritten, it is true, but there, and only waiting the writer.

And in our own art, are all the tales exhausted, and are we at best to repeat—in perhaps slightly, very slightly different words—those that our fathers told, with here a change of adjective, and there an added or a diminished emphasis, with this trifling omission, that small addition? Did our tales, ours as architects, stop short a hundred years ago, leaving us tongue-tied and silent, unless we speak a Georgian speech, and talk in the eighteenth-century words of our great-grandfathers? (I do not stop here to ask if even their architectural utterances were the best to which they might have attained, and if they—and their fathers in turn—were not, at most, speaking in a kind of dog-Latin—or dog-Roman rather—more false and unnatural even than the would-be Classic Pastorals and Eclogues of their literature. That would be to discuss what *their* aims might and should have been. I am considering what ours of to-day should be.

As their language helps us of to-day to speak, so their architecture is an element in our education; and education should merely fit us for that design for which we too often

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find it substituted. If, in a given building, we have, for instance, to carry a weight, let us admit that our beam or bressummer need not necessarily be borne by a column modelled, with more or less faithfulness of copy, upon what the Greeks, or the Romans, or the builders of the Middle Ages have done before us. It is *our* weight, to be carried in *our* way, and it is for us to think out the problem of how best to make and shape and fashion the column to do *our* work, not to solve our difficulty by borrowing their method.

Sydney Smith's profane one, who was, like Talleyrand's *père de famille, capable de tout*, and who even went so far as to speak "disparagingly of the equator," was, I imagine, the most orthodox of persons compared with him who, in this room and to this audience, ventures to breathe a doubt as to the supremacy and all-but-sacred character of the Corinthian column, and whose architectural agnosticism looks with the same unorthodox eye alike upon the "Five Noble Orders of Architecture" and the various "Periods" under which archæological architects have tried to catalogue Gothic architecture.

Such a profession of want of faith is sure to be met—I have heard it over and over again—by what is supposed to be a crushing *ad hominem* rejoinder. The sceptic is told that till he shall, in the first place, himself produce, or, in the second, shall put forward evidence that it is possible for himself or others to produce a column that shall approach even within measurable distance of the Greek model, it were better that he held his presumptuous tongue, and—like his interlocutor—were content to recognise that the Corinthian order gives architects the best and highest and final expression of the column possible. And, further, that thus recognising it, he should feel happy and grateful for so good a thing to copy. (Of course, by the way, he need not adopt the actual word "copy," but may use the more refined method of expressing the same thing, and refer to it as his "precedent" or "the source of his inspiration.") In answer to which I would urge that, while no art is entirely and absolutely "upon all fours" with another, and admitting that analogy is generally a somewhat specious method of argument, I think it quite a fair and legitimate request to ask you to put to yourselves for a moment this problem of dependence upon the great achievements of the past in the terms of another art. Let us see, for instance, how it looks when presented to us, not as an architectural, but as a literary question.

There were great Greek architects—say, for example, Callimachos, or Scopas, or Ictinos—who wrought with their highest power and skill upon a certain factor in design common to them all—the Corinthian column—and produced examples of this beautiful feature which are recognised as reaching the highest possible point of attainment of which it is capable. They obeyed at the same time all the necessary conditions—their column has base, shaft and capital; it has proportion; it suggests strength where that quality and expression are called for, and elegance, where æsthetic claims demand it. The result is beautiful beyond question.

Well, let us now, as our parallel in literature, turn to poetry, and taking the sonnet, let us posit for the sake of my illustration, that Shakespeare, Wordsworth, and Keats have written the finest and most perfect verse, in this particular form, of which our language can boast. And, for the further purposes of my argument, I take these, the three greatest writers of sonnets, as the equivalents in literature to those who created the most perfect productions of Greek architecture. Then, if we regard both these great architects and these great poets from the same logical standpoint, it is no straining of argument that puts us into the position to paraphrase what we already say to the modern architect, and to cry to the would-be sonnet-writer of to-day, "Hands off! The most supreme shape in which you feel your thoughts could mould themselves is not for you! Do you forget that through Shakespeare, or Wordsworth, or Keats, the greatest sonnet that the world has seen has already come into being? With perfection thus attained, why ask us to be satisfied with less? Are you then so presumptuous as to offer us your own poor thoughts in your own halting words simply because they *are* yours, and because you feel that only thus can you speak your own message? No! The best is written, and for you remains at most humbly and reverently to offer us more or less imitative variants of that great work."

Do not misunderstand me on an important point in connexion with this illustration. I am taking the sonnet—a form common to all poets—as the parallel to the column in general—a feature common to all architecture. You cannot allege that my position is the ridiculous one that because great men have used them we ought to abandon the sonnet-form in poesy, or the column in our own art. My point is that in architecture we copy—whether we call it so or not—what we consider the very finest example of the past, calling the result architecture, and it would be but a mere "parity of reasoning" if we were in the same way to copy absolutely the most perfect sonnet of Shakespeare and to call that result our poetry. It should influence every poet; no poet should copy it. The column of Ictinos should influence every architect; no architect should copy it.

Or let us imagine, again, a poet of the past who has breathed into his verse the fullest and most satisfying expression of the mystery and beauty of the dawn, and whose noble lines reveal to us, in highest degree, its very soul and essence. Is, let me ask, the wonderful and supreme beauty of this achievement of former days to silence, as if it were sacrilege, the voice of later poets who also hear what Nature has to say when another day is born? Are they to be told that it is for them presumption to try to sing the dawn, and that its spirit and sentiment, and charm and beauty have been, once and for all, seized hold of, and cast into so perfect a form that it is rank profanation to touch the theme again?

It is only in bricks and stone that we express our wants and ideals by means of borrowed Elizabethan phrases rather than in our vernacular; only in our churches that we imitate the archaism of Chaucer—an "English undefiled" it is true, but his of the fourteenth century, not ours of to-day.

No Madonna that, say, Botticelli or Raphael ever painted has daunted a later artist from attempting the subject. Neither their work, nor that of another, whatever be its perfection, will be looked upon as being so far the completest sublimation of all that man can say of woman's beauty and mother's love that he must regard that realisation of the subject as so perfect that neither he nor another should dare, without presumption, to put forward their own conception of it. Unlike the architect, he does not rest content with the low aim of copying that work again and again, with such strict accuracy, or such slight deviations as his nature may suggest, or to which his technical skill be equal.

I am not contending that copyism does not find its way into other arts than ours, but I do urge that at most they copy the methods, the technique, the principles of other men and other schools; they do not, like us architects, copy the actual work. Our only invention is in the rearrangement of other men's thoughts; our only thought how to redispose other men's inventions. And even if in some degree imitation and copyism exist in the other arts, ours is the only one *based upon it*.

We do not and we will not call it copyism or imitation, but we use a hundred and one qualifying expressions to soften down those words. We talk of our "precedent," our "source of inspiration," of the "freedom with which such-and-such a style has been treated," of the "fresh and clever way in which the architect has dealt with his limitations of style," and so on, and so on. But all these phrases do is to express that the work is not a strict copy; that it is but in part imitation; that the pretence is dropped at times, and it is not all mimicry. They do but mean that, here and there, the architect was tempted to think for himself. As a matter of fact, these occasional lapses into heterodoxy are regarded with a good deal of that suspicion natural to the orthodox, and the regular practitioners are pained and shocked at any departure from those recognised and traditional formulæ which they themselves have christened architecture.

Yet, for myself, I welcome these lapses, and would fain see them more frequent and their scope wider, till at length the "free treatment" spread over the whole building.

You will remember that I spoke above of designs which were so far daring as to show a quarter of individual and spontaneous thought, as compared with three-quarters of dependence upon recognised style. I advocate no impossibility, or unattainable ideal, when I plead for at least a reversal of those proportions, and that your work shall show your own personal thought and individual ideas as by far the larger element in the design. Approach your problem with all your education and your knowledge at your back, but with the intention to compel that education and knowledge to work your will, and not to submit to their leading you away their captive and their slave. Face your design—your plan, or elevation, or tower, or door, or cornice—as your own work which you must do in your own way, resolving to infuse it with the qualities you feel it ought to possess to represent *you*, and not with those that memory points out as being necessary to some selected style.

I am no despiser and contemner of that accumulated experience we call tradition, and, in asking for our release as architects from the necessity to conform to the styles of other days and countries, I recognise as much as any one the need of education, and that acquaintance with the highest achievements of other men that best fits us to express ourselves also at our best. As Sidney Lanier puts it, "Once for all, in art to be free is not to be independent of any form; it is to be master of many forms."

I am not asking you, as I said before, to try to be "original," but I *am* begging you not to copy. And to start intending to shape an architectural design upon the lines of any style must, of necessity, imply copyism on a greater or less scale.

It is in placing individualism, fully equipped by education, before stylism that one sees the possibility of architecture becoming once more a speaking tongue, by the means of which man's wants and ideals of to-day shall be clothed in the outward shape those wants and ideals ask, and not in the worn-out trappings of the past, or the mouldered cerements of times for ever dead.

Let me conclude with one of E. Wharton's apologues:—

"There was once a man who had seen the Parthenon, and he wished to build his god a temple like it.

But he was not a skilful man, and, try as he would, he could only produce a mud hut thatched with straw; and he sat down and wept because he could not build a temple for his god.

But one who passed by said to him, 'There are two worse plights than yours. One is to have no god; the other is to build a mud hut, and mistake it for the Parthenon!'"

To which I add this as rider: "Nay," said another passer-by, "You would have built a better temple to your god had you had an ideal of your own, and so no need to copy—even the Parthenon."

Mr. H. T. Hare, in proposing a hearty vote of thanks to the lecturer for his extremely interesting paper, said the address contained many eloquent thoughts which really required much consideration before one could discuss them. No one who heard the paper could fail to agree with much that it contained in reference to the demoralising effect of mere copyism, but still, in condemning, as the lecturer did, the large amount of copying which one saw on all hands, he had not looked at the matter from quite as broad a point of view as he might have done. One should not look at the work which was carried out around one during two or three years, but should take a very much wider field and consider the work done, perhaps, during a century or two. The development of architecture, and other arts too, was not a matter of a few years; it was a matter of generations. Schools arose and declined, but each school depended upon all which had gone before, and he was rather inclined to think that in future generations, when the Victorian age was looked back upon, it would not be thought that we had been such copyists as possibly we thought ourselves at the present time. All architecture was based upon a study of tradition and what had gone before, and in every generation the majority of men had only mediocre capacity, and in translating studies into work they could not help producing more or less mere copies of the work they studied; but there would always be one or two men with sufficient originality and energy to produce something which would contain life and vigour and which would be above mere copyism. Without mentioning the names of contemporaries, there were those who

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had lived in recent years who were certainly not mere copyists. He did not think that any one could say that Street was a mere copyist, for there was a great deal more life in his work than could be attributed to mere copyism, and yet he worked in the Gothic style. Again, taking Classic work, no one would say that the work of Cockerell was mere copyism; there was a great deal more than that in it, and a good many people now recognised the great merit of Cockerell's work who would not have done so while he lived. The work of the men of the Renaissance revival, although it was done more or less on the lines of the Classic architects, could not possibly be said to be copyism. The work of Palladio and Inigo Jones was full of the greatest possible originality, but at the same time it was being done on purely traditional lines. The great drawback to such generalisations as those Mr. Townsend had expressed was the personal element. It could not be expected that every one could have sufficient individuality to create original ideas, and, in so far as that was the case, he thought it was safer for the majority of men to confine themselves, perhaps, to working on purely traditional lines. At the same time he thought that Mr. Townsend's paper could not fail to do a great deal of good in leading people, especially young men, to think for themselves and to strive after some attempt at originality in their work. It was very important to impress on young men the necessity for study, and the fact that no amount of originality could possibly take the place of serious study.

Mr. Francis Hooper, in seconding the vote of thanks, said that Mr. Townsend had addressed them as a "learned society," and he was afraid that they were hardly equal to some of the lecturer's flights of imagination. The element of tradition was an extremely important thing, and even by following tradition most men found it extremely difficult to produce even second-rate buildings, to say nothing of first-rate ones. The element of "originality" appeared to him rather to develop itself in handling of new problems which faced them in their work. He supposed that no one there who had designed any work had ever found the problem before them exactly solved by some one else, and therefore "originality" to an extent was thrust upon them. It appeared to him that first of all they had to educate themselves to appreciate what were works of art—*i.e.*, buildings which would always hold their own as works of art—and then to get inspiration from them rather than trust to themselves and their own initiative in solving problems of mass and detail which had been worked out by men of accumulated experience. What he urged, in short, was that, with the enormous fund of resource in the work of our forefathers and our contemporaries, it was rather a dangerous matter for an inexperienced man to attempt to open up a new path. Mr. Townsend himself was venturesome, and they were bound to respect the amount of individuality which marked his work, and that example would perhaps be an incentive to others; but the necessity was first of all to secure a knowledge of good work, and from that to develop something that was better. As Mr. Hare had said, we were not able to appreciate properly the work of our own day. Without mentioning names, there were Royal Academicians who had greatly influenced their generation by their work, but who had not striven after originality, but had, particularly at the outset, closely followed the lines which had been laid down by their predecessors. Other gentlemen, who were honoured by them all, had given their work an originality which had not deprived it of its native characteristics, and had influenced their generation and our national architecture in a way that would long survive. While appreciating very much Mr. Townsend's desire for young students to get off the beaten track, he thought the advice needed to be taken with a great deal of caution. He thought it was probable, for instance, that Mr. Bolton, the head-master of the Day Schools, would prefer to take students through all branches of the past, and in the matter of design that he would indicate that where new problems had to be solved they should be solved on lines laid down in the past, feeling that it was better and safer to do so than to attempt new methods in which experience had to be gained.

Mr. F. Lishman said that, as had been said, the problem which faced them at each period was the crux of the whole matter, and there was no doubt that if they treated each problem honestly something original would come out of it. The danger was conscious originality, and for that reason it was probably a dangerous principle to preach originality. It led to a striving after originality when the times were not ripe for it.

Mr. Alex. Wood, M.A., said that what the lecturer had said as to originality appeared to be perfectly sensible and just. Every writer or speaker had his own form, and could not be followed in every particular; but, in the case of Mr. Townsend, he had based his demand on a thorough study such as the students of the Association had within their reach, and there was nothing to be offended with in his claim for originality so far. The only thing he (the speaker) was in doubt about was whether one could really be truly original in art. Even if they did not consult books, they would find themselves almost insensibly following those things which they had seen about them all their life, and he did not think they could really escape from those associations any more than they could escape from their shadow. As to absolute copyism in work, he doubted if it was possible to copy. Take the most conventional thing—a church, say—and set out to design one in the Gothic style. First of all there was the matter of funds, which were often quite insufficient for covering a large area with materials on the lavish mediæval scale. In the mediæval days there was no such difficulty; there was plenty of material, and the work produced was, for that reason alone, generally something quite different from a modern church. Then take a man like Pugin. There was not a man more servile in his adherence to the mediæval period, but a large number of his churches did not in the least seem to be reproduced mediæval work, and often Pugin had but limited means with which to erect his churches. The site sometimes absolutely determined the form of a building, and was the most original part of it, though originality was generally looked for in the elevation, though that was a mistake, for the plan was the novel part of the building, and what was put upon the site was dependent on the plan. In the lecture at the previous meeting an entirely new problem—the tall buildings which were being erected in America—was dealt with. He hoped we should never get in this country buildings of 300 ft., though it was quite possible we should get them 150 ft. high, and what, he would ask, were they to do in the way of precedent in those buildings? The only way to deal with such buildings architecturally was, he thought, to take the lower stories and treat them as basement; but how to devise an adequate crowning member he did not know. His point was that the necessities of plan and materials were the dominant factor, and style would have to adjust itself.

The Chairman, in putting the vote of thanks to the meeting, said he was glad they had had that paper from Mr. Townsend, for he was, as far as he knew, an exponent of a school which came midway between two widely differing schools at the opposite poles of thought. They were not, however, so widely different when one came to study what they taught. Mr. Townsend seemed to discount tradition very considerably, but he took the line that we should give a thorough basis of training to a young architect in what had gone before. That was the policy of the Association in its teaching, and he thought there could not be two opinions that, at any rate, a foundation must be laid of a thorough grasp of what the best men had done in past periods. Then Mr. Townsend went on to say that individualism, *i.e.*, the thought of each man's own mind, should find expression in everything he did. There could be no difference of opinion as to that being a perfectly sound and healthy teaching, though the difficulty was how far could it be done? It had been put very plainly by some of the speakers that evening that the progress of individuality must be very slow, and the history of architecture in all the great periods of its development clearly pointed to this being the case: it was the same with all arts; it was the same with literature especially. The English language, perfected by Shakespeare, had hardly undergone any change during the last three centuries, and when a man tried to be original in his vocabulary, he was generally pedantic, and failed to impress his views of originality on the nation. One occasionally found a word in one of the morning papers which seemed to be perfectly original and expressive, and which one felt sure would be adopted, but one never saw it again. In music, literature, painting, and even sculpture, originality was very slow indeed to express itself, simply for the reason given by Mr. Hare, *i.e.*, that the vast majority of us were very commonplace in our views and thoughts, and had not the capacity to rise above a certain level, and therefore could not express what we did not feel; and he (the speaker) was inclined to think that rather than have ignorant originality he would prefer a very close adhesion to precedent, provided that that precedent was a beautiful one, and that the designer designed in good proportions and in the great principles which applied to their art. In our schools those principles should be insisted upon, for they applied everlastingly to what we have to do, and if a man had not the power to feel and express with innate beauty it was no use his thinking of being an architect, for he would never make one. But if he had that power he would make whatever he touched beautiful, and the more thought he gave to his work the more beautiful it would be, for the more expressive would be the individuality. The great point which Mr. Townsend had been trying to bring out was that they should master the past and not let the past master them. Take a practical illustration. Wren was very original, and it was due to the immense variety of novel design in the domes and turrets he put about London that the city was as beautiful as it was, and yet Wren adopted precedent in detail very largely—almost too much, some of them might have thought. It was the same with Inigo Jones, who had not nearly the same originality, but who had great power of proportion; and Barry, too, in the Houses of Parliament. They were all original, in spite of belonging to the old school. It was the same with Mr. Bentley, who was doing such beautiful work: everything he did showed the same beautiful feeling; and Mr. Norman Shaw and Mr. Waterhouse showed marked individuality. With monumental work, however, it became more and more difficult to be original. Mr. Townsend practised what he preached, and a little church of his at Blackheath, near Albury, in Surrey, was a beautiful little work of its kind, all the conditions and requirements of which had been thought out very carefully, and the result was a real work of art. Some gentlemen of the school to which Mr. Townsend belonged went to far greater lengths. That school was certainly to be trusted when it urged that expressions of the past were not to be slavishly followed. One must not forget, however, the limitations imposed by clients, many of whom, he was afraid, would rather have commonplace work than beautiful work—not because it was commonplace, but because they did not know the difference between the beautiful and the ugly. A midland architect said to him the other day: "I am sorry to say that the vast majority of people who build in our neighbourhood really prefer ugliness to beauty, and that is a very serious drawback and hindrance to our work." The motto that evening was "Think, think, think." If they took that to heart, they would never take anything for granted, and gradually, according to the capacity they had, they would improve the art they practised.

The vote of thanks having been heartily agreed to,

Mr. Townsend, in reply, said he was afraid he did not seem to have made himself sufficiently clear on one point which had been touched upon by several speakers. He had repudiated, more than once, any recommendation to attempt to be original. Over and over again he had said: Do not attempt to be original; if you do attempt it you will not succeed. He remembered a few words by Kipling, and he would quote them:—

"When the flush of a new-born sun fell first on Eden's green and gold,
Our father Adam sat under the Tree and scratched with a stick in the mold;
And the first rude sketch that the world had seen was joy to his mighty heart,
Till the Devil whispered behind the leaves: 'It's pretty, but is it Art?'"

The bearing of this on what he had been saying was that our forefather Adam in his "first rude sketch" *might* lay claim to originality; Cain and Abel were the first copyists. We could not escape the effect of what had preceded us, and none could be original in

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the primitive sense of the word; but what he said was that though we could not be original, it was the easiest thing in the world to avoid being mere copyists — if people would only believe it. People seemed to think that to be "original" they must set out to produce something that the world had never seen. It was not so; they were original enough when they produced something because they must. Let them leave out the cornice or anything else, if they liked, but not merely because someone else had done so. Proportions were not to be followed unless the work shaped best according to those proportions. They drew a column, say, because it pleased them, and were content to be judged as architects, artists, or inventors by that which pleased them, and consequently expressed their individuality, and it did not matter if it *happened* to resemble something already done. It did matter if they had tried to do what someone else had done.

The Chairman said that the next meeting would take place on the 14th inst., when Miss Ethel Charles would read a paper entitled: "A Plea for Women Practising Architecture"—the first paper ever read before them by a lady.

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

I.—CHRIST CHURCH, BRIXTON-ROAD.

ON Saturday, February 1, the Architectural Association paid the first spring visit of the session to Christ Church, Brixton-road. Professor Beresford Pite is the architect, and, as might be expected, the visit proved more than usually interesting.

A series of drawings had been arranged on a screen, and the Professor showed the members the paper history of the church from its first inception some six years ago down to the last revised ½-in. detail of the Brixton-road façade. He explained that the difficulties to be overcome were limited money and space, chancel at the west end, and, most important of all, the necessity for the whole congregation seeing and hearing, with ample provision for choir and organ for a singing congregation of at least 1,200. The way these difficulties have been overcome is at once characteristic of the author and striking architecturally. Gothic tradition has been cast aside, and the result is a building aadapted in every way to the needs of twentieth-century requirements, and appealing at once to the imagination by its inherent truthfulness both of construction and plan. Every seat in the church has a view of the pulpit, entirely unhampered by piers or columns. The nave, with transepts of equal width, are thus clear floor space, the crossing being covered by a dome. The chancel is apsidal, with columns forming an ambulatory, and a noteworthy feature is the fact that this ambulatory will be used by communicants, the altar rail forming the inner arc and extending from column to column. The ceiling over the apse is a half dome, carried on the stone columns, the ambulatory being ceiled by barrel vaults. The windows in this are high up, and are partially screened by the columns.

The dome is carried on four great brick arches 4 ft. 6 in. wide and perfectly plain and flat in section. The square is reduced to an octagon by diagonal iron girders which will be frankly seen, the pendentives being formed in plaster. Ventilation is effected by means of a shaft rising from the centre of the low inner dome to a cupular above the outer dome. The angles of the inner dome, which is formed by the intersection of eight vaults springing from the side of the octagon, are without ribs.

The construction of the nave roof is by timber (pine) trusses carrying trussed purlins. The pitch is flat, and acoustic properties have been considered by forming a flat trunk in the centre under the apex, with returning slopes intersecting the main roof. The whole roof is boarded, and a curious effect has been obtained by a bold treatment of staining and leaving clean alternately short lengths of 18 in. of the boarding forming a sort of diaper. The transept roofs are similar but without a main truss. In the present incomplete state it is almost impossible to judge correctly the ultimate effect of this treatment, but it is certainly very strong and original.

At the east-end to Brixton-road a large gallery has been placed which will contain the choir and organ, as well as a large number of sittings. The organ will be partially placed in the centre tower of this façade, and access to the gallery is directly from the outside by means of stairs on either side. The general treatment being a narthex with a central tower. Space does not permit of a detailed description, but externally the grouping of this eastern façade with the central tower, the long lines of red roof, and the green slate-covered dome behind it, is very powerful and effective.

A grand effect of texture and scale has been obtained by keeping the pointing back quite half an inch from the face of the brickwork and by the skilful use of London stocks, varied with bands of a darker coloured brick. These bands are also varied in number, according to the different planes of the building, being most frequent in those most recessed.

The feeling of texture is well maintained by the strong lines of the Bridgwater tiles and the small green slates covering the dome.

The completion of the building will give to London not the least of its many interesting churches, and this certainly will rank as a splendid example of what can and may be done to overcome modern difficulties with modern methods, and produce fine architecture at the same time.

SANITARY INSPECTORS' ASSOCIATION:

ANNUAL DINNER.

THE nineteenth annual dinner of the Sanitary Inspectors' Association was held at the Holborn Restaurant on Saturday evening last. Sir James Crichton-Browne, President, was in the chair, and amongst those present were Sir Walter Foster, M.P., Dr. Farquharson, M.P., Dr. Shirley Murphy, and Messrs. Atherley Jones, M.P., R. M. Prescott, Laurence Gomme, and E. Tidman (Hon. Secretary).

The loyal and patriotic toasts having been honoured, Sir Walter Foster proposed "Local Government," and said that if the local authorities were unable to obtain from Parliament all they asked, they should take all they could get and come again and endeavour to get a little more, and so proceed step by step.

In reply, Alderman Francis, J.P., of Southend, said that as representatives of a seaside town, his Council appreciated the need of, and had done their best to obtain, perfect sanitation. They desired, also, to have control of the water supply, and although their last application was rejected they hoped when next they applied to Parliament for the necessary powers their Bill would go through.

Mr. Laurence Gomme said that all sanitary inspectors should secure certificates in proof of their knowledge, as there was no room for failures.

The Chairman, in proposing the toast of "The Sanitary Inspectors' Association," said the great point which the members of the Association must always keep before them was the improvement of the condition of the people, physically, intellectually, morally, and socially. They had to remove the cause of disease and then healthy homes would make happy and more respectable people. The great advantages offered them for the winnowing of knowledge, perfection of skill, and encouragement of research should not be neglected, and he hoped that every sanitary inspector would obtain a recognised certificate of proficiency. They must remember that not only length of life but quality of life had to be considered, and prolongation of life was only desirable when that life was characterised at every stage by wholesome activity of all its functions. That happy state could only be brought about by perfect sanitation, and he believed the means to be employed were constantly engaging attention at the ordinary meetings of the Association. In the solution of the great housing question, sanitary inspectors could give invaluable assistance from their knowledge of the needs and opinions of the people obtained in their daily intercourse with them. With regard to the problem of the water supply, he was of opinion that Mr. Long's Bill must be only a preliminary measure, as he believed that an enormous increase in the consumption of water would soon take place in consequence of every man, woman, and child taking a daily bath, and it would become necessary to conserve and carefully distribute the supply of the whole country. There were other matters which might well occupy the attention of the Association, as we were yet unable properly to ventilate and purify our sewers, or properly to ventilate and warm our houses, and in the satisfactory disposal of town and domestic refuse much remained to be done.

Dr. Shirley Murphy submitted the toast of "The President," and said he regarded the union of Sir James Crichton-Browne with the Sanitary Inspectors' Association as a most happy event, as his knowledge of and interest in the subjects with which they had specially to deal was of immense value to them. He had watched the development of the sanitary inspector, from a man who was no good for anything else, or a time-expired policeman or soldier, to a man with a certificate who now deals with questions formerly considered outside his province.

In replying, the President said that every epidemic left behind a number of people with their mental faculties shattered, and sanitary science would improve the department of mental hygiene. He suggested that a Minister of Health would be able to do much to aid them in their work. He had an announcement to make which would interest all of them. The solicitor to the Chadwick Trust had written stating that at the last meeting of the Trustees it was decided to offer a prize of 50*l.* and a Chadwick medal to that member of the Sanitary Inspectors' Association whose official report or reports made during 1902 should, in the opinion of the Trustees, be most conducive to municipal or rural sanitation. He thought this offer was valuable as a recognition of the position the Association had obtained and an encouragement to its members. It would also keep green the memory of Edwin Chadwick, a pioneer of sanitation, in the hearts of those who were most likely to appreciate his work.

The other toasts were "The Visitors" and "The Press." During the evening an illuminated address and a diamond ring were presented to Mr. W. H. Grigg, late Chairman of the Council.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday at the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Greenwich Borough Council 6,100*l.* for offices; Stepney Borough Council 2,000*l.* towards the purchase of Albert-square, Commercial-road East, as an open space; Poplar Borough Council 2,000*l.* for erection of a public library at Bow; and Chelsea Guardians 4,740*l.* for drainage works at workhouse.

List of Rates of Wages and Hours of Labour.—The same Committee reported as follows, the recommendation being agreed to:—

"We have had under consideration an application from the Electrical Trades Union for increases in the rates of pay for certain electrical workmen to be made in the Council's list of rates of wages and hours of labour. We have made inquiries into the subject, and are of opinion that the rate of wages for armature winders should be increased from 8*d.* to 9*d.* per hour, but that the other rates asked by the union are not those in practice obtained. We are in communication with the union on the subject, and meanwhile we recommend that the Council's list of rates of wages and hours of labour be amended, and that the rate of wages of armature winders be increased from 8*d.* to 9*d.* per hour."

Acts of Parliament Affecting London.—On a recommendation of the General Purposes Committee to spend 650*l.* for printing the public and private Acts of Parliament relating to the work of the Council, Mr. R. A. Robinson said he thought the Council would do well to support a petition for the consolidation of the laws relating to London. There were seventeen Borough Councils in favour of that being done.—Lord Welby expressed the opinion that the time was favourable for pressing forward for the consolidation of the Acts relating to London.—After some discussion the recommendation was carried.

The Works Department.—The Report of the Finance Committee, submitting the half-yearly return of works completed by the Works Department, which was adjourned from December 17, again came up for consideration. Statement I. dealt with twenty-one estimated works, and gave the following results:—Original estimate, 103,871*l.* 17*s.* 8*d.*; final estimate, 103,620*l.* 16*s.* 2*d.*; actual cost, 118,162*l.* 5*s.*; balance of cost above final esti-

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mate, 14,541*l.* 8s. 10d. There was a loss on the North Woolwich drainage works of 16,714*l.* 3s. 8d. Statement II. showed that on estimated works undertaken by the Department since its inception the cost exceeded the final estimates to the extent of 78,844*l.* 16s. 6d.; while on jobbing works the cost below schedule value was 11,149*l.* 0s. 7d. In reference to the drainage work at North Woolwich, after laying before the Council the reports of the Works Manager and the Engineer, the committee remarked that whether the Manager was justified in accepting the work at the amount of the Engineer's estimate, notwithstanding the condition of the Department at the time, they were not at present in a position to state; but, as he did undertake it with full knowledge of the nature of the work and the prices then ruling in the market, they could only regret the result, though, having regard to the unfortunate circumstance of the subsequent rise in wages and the prices of materials, anybody who might have undertaken the work would probably not have made a financial success of it. They desired, however, to express their regret that their attention was not called at an earlier stage to the excess expenditure that was being incurred. In conclusion, they stated that, having visited the pumping-station and the immediate neighbourhood, they were satisfied with the quality of the work done, and had been impressed with the fact that considerable difficulties had to be contended with in its execution owing to the marshy character of the ground, the level of which was much below high water mark. The Engineer, in his Report, stated that briefly it might be said that the work at North Woolwich was "from the first very badly mismanaged."

Mr. W. Peel, M.P., said he must call attention to what was a grave administrative scandal in connexion with the sewer work in North Woolwich. He would have to say something about the Works Department, and he was aware that would touch the Labour Party in their tenderest feelings, because the Works Department was the core and centre of their policy. He knew Mr. Burns said the Works Department must be reconstructed, but the reconstruction of a company was generally associated with a further call on the shareholders. The supporters of the Works Department had said, "It is quite true that we have made a mess of houses, but we can build sewers; they are our strong point." Well, with regard to this particular work, instead of taking eighteen months it took four years. The engineer, in his report, said, "The work has from the very first been badly mismanaged," and that about summed up the matter. He contended that the whole of the explanatory Report showed a lamentable ignorance of the work which was undertaken. The fact remained that had the work been entrusted to a contractor, he would have had to bear the loss which might have resulted in a rise in wages and materials consequent on delay. All the excuses contained in the report were subsequently discovered, and it showed the most complete ignorance prevailed throughout as to the conditions under which these kinds of works were carried out. Compared with the contractor, the Works Department was an amateur. This was an age of specialism, and they must take work to those best qualified to carry it out. In that way they must secure a better and cheaper article than by entrusting all kinds of works to one single department. He moved that the Report be referred back.

Mr. Cousins seconded the amendment, and said that architecturally the Works Department had been tried and found wanting. The Department had erected houses for the working classes which exceeded the estimates of the architect by 25,000*l.*, while, on the other hand, contractors had erected buildings for the Housing Committee at a saving of 15,000*l.* on the architect's estimates. The Works Department could not complain of not having had generous treatment, but the fact was there was nothing to stimulate the activity of the Department. At the present time there was an outfall sewer being constructed, partly by the Works Department and partly by contractors. He ventured to prophesy that it would be found there would be an excess of cost on that job as large as there was on the North Woolwich job. A profit was claimed for the jobbing works of 11,000*l.*, but that was on a grossly excessive schedule. Well, the jobbing works of the War Office were done on a schedule 16½ per cent. below that of the Council, and a contractor had offered to do the Council's jobbing work at 18½ per cent. below the jobbing schedule.

Earl Carrington said that when abuses were found out in the Fire Brigade they did not suggest that the Brigade should be knocked on the head. If they got a new manager, and the Department was reconstructed, and then, after a fair trial, they could not make both ends meet, then they had better "shut up shop."

Mr. P. Harris remarked that the analogy between the Works Department and the Fire Brigade was rather forced. The only question before them that day, however, was whether the results of the North Woolwich job had been adequately investigated, for, so far as the Report before them went, the statement of the engineer was in direct conflict with that of the manager.

Mr. H. Ward said a more libellous statement had never been made than that their jobbing schedule was grossly excessive. It was a gross libel on the architect and the engineer. The quality of the Council's work would compare with the work done by the best of contractors and the work had been carried out at competitive prices. The War Office schedule was of an entirely different character to that of the Council. The bulk of the jobbing was being done at prices which had been tested by schedule. The only way to test the department was to take it as a whole. Since its creation it had undertaken work costing between 1,500,000*l.* and 1,600,000*l.* The deficit on that was 79,000*l.*, but there had been a saving on the jobbing work of 12,000*l.*, so that the total deficit was 67,000*l.*, or about 4½ per cent.

Mr. Beachcroft said he presumed that the General Purposes Committee would come forward with a new scheme for a Works Committee. He believed their only hope lay in abolishing the Works Department altogether, and when the proper time came he would have the courage of his convictions, and move a resolution to that effect. There ought to be a full inquiry into the sewer work at North Woolwich, and that it should be an inquiry by experts.

Mr. Burns, M.P., said the Works Department had been intermittently overworked and starved, and if they had had a guarantee of work even the loss on the North Woolwich sewer would not have occurred. The question of the "go easy" workman had been brought in. He repudiated any such policy on the part of the workmen, but if the workmen did follow it who could blame him when he saw the loafers in high places acting on the principle of getting the most salary for the least work. With regard to that particular work it was taken just after the works manager came in, and there was no doubt that the manager took the job at far too low a price. Immediately afterwards, there was an abnormal rise in the cost of labour and materials. The existence of the Works Department had been successful in pulling down builders' prices 25 per cent., and if the Department had not been so successful as it might have been, he asked them not to blame the Labour Party, who had honestly tried to make it a success. He believed they would have to go back to the old régime and put the management of the department under a small Works Committee. The Works Department was established because certain contractors withdrew their tenders, formed a ring and bribed the clerks of works.

Colonel Rotton and Mr. Fletcher having spoken,

Mr. R. Williams said he thought a good case had been made out by the manager. As to the work of the department, it was done, on the whole, better than was the average work of the contractor.

Sir J. Dickson-Poynder, M.P., said the Report was of a graver character than any which had been previously submitted. What had struck them was that no reply had been made by the Leader of the Progressive Party. The speeches made against the Amendment were the weakest and flimsiest he had heard for some time. Mr. Burns had never answered one single charge made by the supporters of the Amendment. The fact was, it was impossible to conduct the Works Department with such a multiplicity of branches under one man.

Mr. McKinnon Wood said he would not have spoken, but for the appeal of the last speaker. One reason why he did not care to speak was because he had for years refused to regard the cost and the final estimates as the right basis to judge the Department on, and he felt that most of the debate that day was mere idle beating of the air. The procedure of the Moderate Party was unfair, because they preserved silence when the cost came out below the estimates. If Sir J. Dickson-Poynder had suggested placing the architectural work under the architect, and the engineering work under the engineer, he would agree with him, because he believed that that theoretically was the way to get good work at the lowest cost. Still, if they had proposed that, they would have been immediately told they were evading a test. The real difficulty to that course being taken was that both the engineer and architect were already overworked.

Mr. E. White observed that every member of the Council ought to vote for the Amendment, because here was a case which they could investigate and find out the fault of the Department. The Council went in for a Works Department because of two savings on sewage work, but since then there had been losses on five sewage undertakings, amounting to no less than 66,000*l.* It had been said the failure of the Department was because it had too little work to do, but in his opinion the less it did the better, for the more work done by it the greater was the loss.

After a discussion of two and a-half hours, the Council divided, with the following result:—For the Amendment, 29; against, 79; majority against, 50. The Report was then adopted.

New County Hall.—Replying to Mr. Sankey, Colonel Rotton said he was sorry to say he could report nothing as to any progress being made in the way of the better housing of the Council. The matter was still in the hands of the Sites Committee.

Breaking-up of the Streets.—Mr. Beachcroft asked what action had been taken to carry into effect the Resolutions of the Conference of local authorities to prevent the constant breaking-up of the streets.

Mr. Benn replied that the Highways Committee had communicated with the road authorities asking their opinion upon the proposal that the Council should exercise certain control over the streets with regard to the gas, water, and other companies. These replies were now being considered, and the Report would be brought up to the Council.

Widening of Hampstead-road.—A lengthy report was submitted by the Improvements Committee regarding the widening of the Hampstead-road. The Council, in their Tramways and Street Widenings Bill this session, are applying to Parliament for power to widen the road, on the understanding, however, that the St. Pancras Council give consent to the construction of a tramway along the Tottenham Court-road. The Local Authority have suggested the construction of a shallow tramway under the roadway, but the Committee have pointed out that there are insuperable difficulties to this, owing to the Metropolitan Railway. The St. Pancras Council are now reconsidering the matter, and, under the circumstances, the Committee recommended that the Council proceed with the Improvement Clauses in the Bill, subject, however, to the local authority giving its consent to the suggested tramway.

This was agreed to.

Theatres, &c.—The following proposals were agreed to on the recommendation of the Theatres and Music Halls Committee:—

Small alteration to the Piccadilly Art Galleries and Princes Restaurant, Piccadilly (Messrs. J. T. Wimperis & Arber).

Arrangements in connexion with the Hackney Empire, Mare-street (Mr. F. Matcham for Mr. O. Stoll).

Regulations for the Protection of Theatres, &c., from Fire.—The same Committee reported as follows, the recommendation being agreed to:—

"The Council on July 30 last revised its regulations with respect to the requirements for the protection from fire of theatres, houses, rooms, and other places of public resort within the Administrative County of London. No difficulty has up to the present time been experienced in the practical application of these regulations except in regard to No. 10, which provides for the number of exits being in proportion to the number of persons accommodated, and the fourth clause of which states that 'in calculating the number of persons which can be accommodated in any tier or part of a tier of such premises, the standing space from which a view of the performance can be obtained, as well as the seated area will be considered.' A

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strict interpretation of this regulation would result in all the gangways being counted in the space reckoned as affording accommodation for an audience, and theatre proprietors would thus be compelled to provide exits sufficient for the persons who could be accommodated in the gangways as well as in the seated parts of the house. If this course is adopted it will be difficult, if not impossible, to prevent managers allowing persons to stand in all gangways, to the extent even of crowding them to the utmost. In this connexion, we would call attention to the fact that one of the rules to be observed by holders of licences for music and dancing or stage plays granted by the Council, states that 'all gangways, passages, and staircases intended for the exit of the audience must be kept entirely free from chairs or any other obstructions, whether permanent or temporary.' On the other hand, it may be argued that when a very successful entertainment is being given in any place of public entertainment it is certain that persons will be allowed to stand in the gangways, and that it is better, therefore, to recognise the fact and secure the provision of sufficient exit accommodation. We think that there is a great deal to be said on both sides of the question, and after carefully considering the matter we have come to the conclusion that the most practical course is to decide that those gangways which intersect the different rows of seating should be kept clear while gangways at the back and sides of the seating may be occupied by persons standing. Of course, it will be borne in mind that this only applies to buildings constructed or to be constructed under the present regulations, *i.e.*, those approved by the Council in July last. In the case of buildings constructed in accordance with the previous regulations of the Council, only sufficient exits were required for the persons who could be accommodated in the seated area, and therefore the gangways should always be kept unobstructed. In order to make it quite clear what interpretation the Council will put upon Regulation No. 10 when considering plans for a new theatre, or music-hall, &c., we recommend—That the fourth clause in No. 10 of the Council's regulations for the protection of theatres, &c, from fire be amended, so as to read as follows:—In calculating the number of persons which can be accommodated in any tier or part of a tier of such premises, the standing space from which a view of the performance can be obtained (with the exception of that afforded by the intersecting gangways), will be considered as well as the seated area."

Gauging Pressure on Water Mains.—In the course of a report recommending the Council to authorise an expenditure of 350*l.* for extending the system of pressure gauges throughout London, the Water Committee stated that the gauge at the Watling-street station had revealed the fact that some part at least of the City was not provided with a constant supply of water. It would appear from the records that, with few exceptions, the water was cut off daily from 3 p.m. to 6.30 a.m. from some of the service pipes. Under the Metropolis Water Act, 1871, the authority as regards the City of London and the liberties thereof was the Corporation, and it was for that body to determine whether a constant supply of water for domestic purposes should be maintained throughout the City. The supply for fire purposes was constant. The above statement of the results obtained since gauges had been fixed justified the Council, in their opinion, in continuing the work of providing such gauges, the existence of which had not improbably caused the water companies to exercise more vigilance in the discharge of their obligations.

The report was carried.

Housing.—The Housing of the Working Classes Committee reported that Maclise-buildings, Millbank estate, have been completed, and are now ready for occupation. These buildings are situated on the north-eastern portion of the estate, and are at present entered from Herrick-street. They provide accommodation for 296 persons in fifty tenements of two rooms and sixteen tenements of three rooms. They are the buildings set apart for the accommodation of persons to be displaced by the carrying into effect of the Holborn to Strand improvement.

Having transacted other business, the Council adjourned at seven o'clock.

THE "MURDOCH REST," SCOTLAND.—In terms of the will of John Murdoch, formerly a plumber in Dundee, who died on December 18 in Edinburgh, a capital sum of nearly 70,000*l.* is left to appointed trustees for the benefit of indigent widowers and bachelors. The trustees propose to build a group of cottage homes upon land within a distance of ten miles from Edinburgh, and to provide for the boarding of the beneficiaries, who will be chosen from amongst those applicants who shall have shown a practical sympathy with the scientific pursuits of the founder.

Illustrations.

DESIGN FOR A ROYAL MEMORIAL CHAPEL.

THIS design, by Mr. Charles Gascoyne, is the one to which the Council of the Institute awarded the Tite Prize this year. The main lines and the scale of the plan, as already mentioned, were given, but the treatment of it was left entirely to the competitors, so long as they kept within the lines of Italian architecture as usually understood.

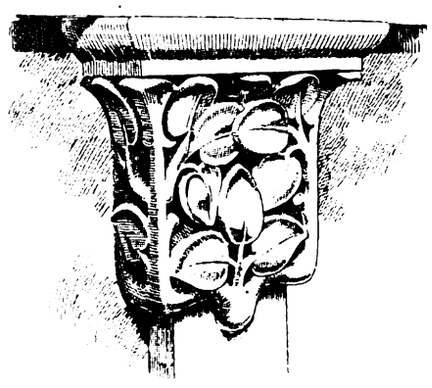
The author says he has no remarks to make in explanation of his design, except that one of his main objects was to study simplicity of treatment. It is owing to this simplicity of treatment, combined with a very quiet and reserved style of drawing, that the design did not produce as much effect, when hung, as many of the others, and we must own to having passed it over in our own review of the drawings, which was necessarily made under the difficulty of having to form an estimate of a great number of designs for the same thing within a necessarily rather limited time. We still think that this design is somewhat tame in character in comparison with two or three others which showed a good deal of genius; but on further consideration we think the award is right, having regard to the fact that it was the only one against which no definite objection could be urged and no special defect alleged; it is a refined design and is consistent throughout in all its details, and would look better in execution than in the drawing. The detail drawing is very good, and the sculptural decoration well put in. A little more effect might have been made out of the side chapels.

The award must have been a difficult one to make, for there were at least half a dozen designs which on the face of them had a fair claim for consideration for the prize; but we think we must agree that it was right to award the prize not to the one which showed most boldness of conception, but to that which was most complete and carefully worked out as a whole.

THE HORNIMAN MUSEUM, FOREST HILL.

THIS building, the gift to London of Mr. F. J. Horniman, M.P., has just been completed and handed over by him to the London County Council. It houses a very large collection of curios and objects of antiquarian and artistic interest, gathered together by him during the last thirty years. It supersedes the donor's own former residence, which eventually became quite inadequate for the growing collection.

The museum occupies a narrow site, with a considerable rise from front to back. This suggested the arrangement by which the level of the overhanging balcony in the entrance front was made to correspond with the level of the North Hall. Each of these exhibition halls or galleries is, on the ground floor, 102 ft. long by 46 ft. wide. Arranged round each



A Capital on the Front of the Building.

gallery are further exhibition rooms, to which access is gained from the balcony. In these are housed various special departments, such, for instance, as the entomological collection, which is an exceptionally large and complete one. The corridor which is intended for exit after making the tour of the museum is also arranged with exhibits.

Attention had to be paid to the foundations owing to the fact that the building is virtually built on the side of a clay hill.

The entrance front of the museum is built of Doulting stone. Its principal feature is a large mosaic panel designed by Mr. Anning Bell, and carried on, under his close direction, by Mr. George Bridge. The subject of the panel is an allegory of the course of human life in the spiritual and intellectual sense. The colour scheme deals with light and tender tones, rather than heavy masses of rich colour.

A large bronze commemorative tablet by Mr. F. W. Pomeroy has been fixed below the mosaic panel, and a fountain, which has been executed by Mr. J. Wenlock Rollins, is about to be fixed in the front court.

The contractors for the foundation portion of the building were Messrs. Colls, of Coleman-street, E.C., and for the structure itself Messrs. James Brown, Son, & Blomfield, of Whitechapel. The engineers were Messrs. A. Handyside & Co., of Queen Victoria-street. Mr. A. W. Jarvis acted as clerk of works, and the architect was Mr. C. Harrison Townsend, of Westminster. The total cost of the museum was about 40,000*l.* C. H. T.

THE CLERKS OF WORKS' ASSOCIATION: ANNUAL DINNER.

THE nineteenth annual dinner of the Clerks of Works' Association took place on Monday evening in the King's Hall, Holborn Restaurant. Mr. Aston Webb, A.R.A., F.S.A., presided, and among those present were Lieutenant-Colonel A. Stewart Harrison, V.D., Professor Wynter Blyth, Professor Elsey Smith, Messrs. C. Wall (President of the Institute of Builders), Spencer Green (the President of the Clerks of Works' Association), Edwin T. Hall, H. H. Statham, Romaine Walker, Clyde Young, E. Ingress Bell, C. F. Selby, L. Maton, W. M. Willson, J.P. (Master of the Worshipful Company of Carpenters), C. Hugman, J. Carmichael, J. H. Freeman, R. B. Chessum, H. H. Bartlett, and F. Shingleton.

After the Royal toasts, the Chairman proposed the "Imperial Forces," which was responded to by Lieutenant-Colonel A. Stewart Harrison, V.D.

Mr. John Davis then proposed "The Architects and Surveyors." He said he thought the architects of this country had splendid opportunities to embody the feeling and aspirations—the sentiment of the inner consciousness of the British people in their buildings, so that in course of time those buildings could be identified as having been erected in the twentieth century, in the same way as they could recognise some of the earlier structures. The London County Council was offering in the new avenue from the Strand to Holborn such an opportunity for architects.

Mr. E. T. Hall, in reply, referred to Mr. Cave's book on the "Buried Cities of Ceylon." In that island, he said, there were architecture and beauty such as were hardly ever surpassed in the whole world. Its ancient capital was 250 square miles in area and was filled with palaces and noble baths. It made them feel very humble; in one building alone there was a ground floor containing 1,600 columns and the structure itself was nine stories in height. They chiefly decorated with gilding, but in these ancient palaces solid gold and silver were used, and festoons of pearls and precious stones were hung round the facias. All these great works had fallen into ruin and were now covered with jungle. In conclusion, he said, architects had a feeling that they were constantly failing in the high aims to which they sought to attain, yet they could do their level best. If they did this they would, individually, leave a good name behind them, although it might not be glorious.

Mr. C. F. Selby responded for the surveyors. He said that the position of surveyors was somewhat peculiar. They were experts' advising experts—architects, engineers, and lawyers. All those persons possessed a knowledge more or less profound which at times called for self-suppression and tact on the part of surveyors. A surveyor's duty was to appraise the cash and not the architectural value of the work. It was not for him to allow for its originality, stateliness, and conception or skill in execution, but merely to value the dry bones of time and material on the basis of ascertained fact.

Mr. J. Bartlett, who likewise replied to the toast, remarked that they had not at present any rules or regulations as to plans, depth of concrete, and so forth. He suggested that the Clerks of Works' Association would very much increase their services to architects and sur

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veyors by publishing a book setting forth some rules.

Mr. J. Aitchison, in proposing "The Worshipful Company of Carpenters," said the Company had done a good deal to help the building trade by the provision of means of instruction. If youths took the opportunity of attending the classes and workshops of the Carpenters' Company, they could not fail to become sound mechanics. They, the Clerks of Works Association, had experienced the great kindness of the Carpenters' Company, inasmuch as they had been housed by them for some years. The Association had made some return by assisting the Company in their examinations.

Mr. W. M. Willson (Master of the Carpenters' Company) said that education was among the activities of the Carpenters' Company. They had been promoting technical education for many years, long before it became as popular as it was at the present time. They gave instruction at their training schools in Great Tichfield-street in the various trades connected with building, and he was proud to say that they had succeeded in turning out some very excellent workmen and work. They were greatly indebted to the Clerks of Works' Association for the assistance they had given them in their examinations. There was a unity of interest between the Association and the Carpenters' Company; the latter endeavoured to turn out good workmen while the former saw that the work was well performed. Both these purposes were very important. There was nothing so important as doing good work. Good work was truth and it would endure.

The Chairman next proposed "The Clerks of Works' Association." He said that in recent years they had seen a very great advance in clerks of works—in their equipment, their method of carrying out their work, and also, he was glad to say, in their remuneration. The clerks of works of years ago were not at all equal to those of the present day. Some twenty-five years ago a friend wrote a little ditty which described the progress of a young man who started as office boy with a builder and passed through the various ranks until he became an architect. When he reached the position of clerk of works the ditty described him thus:—

> With builder's work he found it tame,
> So clerk of works he next became;
> The work was less, the wages more,
> And he liked to boss the contractor.
> He wore a two-foot rule and suit of grey,
> And now he is a F.R.I.B.A.

The Clerks of Works' Association did not appear to issue an annual Report, and the membership, he learned, had not increased in the last two years. There were reasons for that, and at any rate it was a point to be seriously taken into account. He had looked at the rules of the Association, and was surprised to find that to qualify for membership a clerk of works must be forty years of age. Of course, it was extremely difficult to be a clerk of works, and so it was to be an architect, but if architects did not join their Institute till they were forty years of age, he did not think many would join at all. This rule certainly excluded a large number of young men from the Association. He believed in young men, and considered that they must be incorporated into societies. He noticed also that they had no benevolent fund. The Institutes of Architects, Builders, Painters, and Sculptors possessed benevolent funds, and surely clerks of works also fell by the way. Were they all so successful that they never came upon bad times? It seemed to him that all clerks of works should join this Association. It was not a trades-union, but an association in which they would greatly strengthen their position. The only way that these associations could be strong was by covering a large majority of the particular craft for which the association was intended. They were met in very difficult building times. Building was now more expensive than it had ever been. The President of the Institute of Builders told him that he considered that the cost of building was more than 25 per cent. greater than it was fifteen years ago. The reason was a most serious one. It was not that the wages were higher, or that the cost of material was greater. The story had been told recently in the *Times;* the reason for the increased cost was the limitation of work by individual workmen. The reason that the output of work by men had been reduced was that two men should do the work of one. This was a most misguided policy, and the clerks of works could do much in their responsible position by quiet example, character, and explaining to the men what a degrading thing it was that a man should care to take full wages, and do half the work in a day. It was not a British, honourable, and fair thing for any man to do. Could not the clerks of works help the builders in this matter, and help the men by showing them how wrong their policy is? They did not spread the work but drove it away. The work was leaving England, and it was much easier to send it away than to bring it back again. Clerks of works were in a responsible position. They were the sentries to the building citadels. As the waggon came in with material it was for them to say, "Is all well?" and if the answer came back in the affirmative they would let down the drawbridge, open the gates, and let the material in, but if they had any doubt they would pull up the drawbridge and let down the portcullis. They were relied upon to a great extent with regard to the quality of the materials and the work. They had difficulties to contend with, but like King Alfred they must keep a high ideal burning in their heart. Their ideal must be of a good building—an enduring and noble building. There were two things which a building required, one was beauty, and the other endurance or truth. The architect must necessarily be responsible, more or less, for the beauty, but those who constructed it were responsible for the truth or endurance of the building.

Mr. Spencer Green, in response, said they intended to place the Association upon a basis of incorporation, and the matter was now in the hands of Mr. Leonard J. Maton. With regard to the age qualification referred to by the Chairman, he was glad to say that they had lately made a new rule accepting as members men who were thirty-five years of age. Probably after the incorporation they would arrange to take in still younger men. He had a strong feeling in favour of a benevolent fund, and should like to see one in connexion with this Association. He suggested that a very good way for the architects to assist clerks of works would be by providing 5*l.* or five guineas to be paid to an insurance company to insure a clerk of works against accidents during the time he was engaged upon his work. He believed they, as clerks of works, were the only men not included in the Employers' Liability Act.

After the toasts of "The Visitors" and "The Hon. Treasurer" (Mr. J. Oldrid Scott), Mr. H. H. Statham proposed the health of "The Chairman"; remarking that clerks of works, who were specially concerned with the practical side of architecture, ought to know how to appreciate an eminent architect who took an all-round view of his profession; who was not only an artistic designer but a master of planning and construction.

During the evening the Chairman, on behalf of the Association, presented to Mr. J. Brady an illuminated address and a microscope, in recognition of his long and valuable services as editor of the Clerks of Works *Journal*.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The fifth meeting of the session was held on the 29th ult., Dr. W. de Gray Birch, hon. treasurer, in the chair. Mr. J. C. Gould exhibited a contemporary catalogue of Hogarth's prints. It is in MS., and was issued from the artist's "house in Leicester Fields," but does not appear to be in Hogarth's handwriting. Perhaps the most interesting feature of the document is the price at which the prints were offered for sale. For example, the set of "Marriage a-la-Mode," in six prints, 1*l.* 11*s.* 6*d.*; "Harlot's Progress," in six prints, 1*l.* 1*s.*; "Rake's Progress," in eight prints, 2*l.* 2*s.*; "Beer Street and Gin Lane," two prints, 3*s.*; "The Two Fellow Prentices," in twelve prints, 12*s.*; "The Sleeping Congregation," 1*s.* The list includes sixty-six prints of twenty-six subjects in all, and concludes by offering the whole together at the price of ten guineas.—Major Freer reported that through the efforts of the members of the Leicestershire Architectural and Archæological Society and the Society of Antiquaries, with the support of two neighbouring societies, the original plans for the rebuilding of the Trinity Hospital at Leicester have been objected to by the Charity Commissioners, and fresh plans, retaining a considerable amount of mediæval work, have been substituted; thus securing the preservation of part of the original north wall and several bays of the double row of stone arches which carried the original roof. The new portion of the building has been carried out on the lines suggested in the memorial presented to the Charity Commissioners by the Leicestershire Society. The original Georgian slate roof has also been replaced. The arches were found to be in a perfect state of preservation on the removal of the modern casing and other obstructions, under which a great part of them had been hidden.—The Chairman expressed the gratification with which he and the meeting had listened to these remarks, and congratulated Major Freer and the Leicestershire Society upon the successful results of their action. A lengthy paper by Dr. Russell Forbes upon the recent discoveries in the Forum at Rome was read by Mr. Geo. Patrick, honorary secretary. The first portion dealt with "The Tribunal Praetoris." The judgment seat of the Praetor was in the Forum, for Livy records (XXVII., 50) how a letter was carried through the Forum to the Praetor's tribunal in 208 B.C., and in 205 he mentions it as being on the Comitium. It is spoken of as being near the Puteal Libonis. Porphyris, in commenting upon this, says, "the Puteal Libonis, the seat of the Praetor, was near the arch dedicated to Fabius, which tribunal and seat were first placed there by Libo." It appears it was at first merely a chair placed for the occasion on the Comitium, and afterwards Libo erected a permanent tribunal in the Forum. Dr. Forbes says nothing whatever has been found at the east end of the Forum "by the arch of Fabius," neither of the Tribunal nor Puteal Libonis, and the passage in Porphyris is incorrect, and has given topographers no end of trouble; but if for the arch of "Fabius" we read "Tiberius," all difficulty disappears, and he proposes to place the Tribunal at the west or opposite end of the Forum, which he considers to be its correct location. The author described the "Puteal of Scribonius Libo," and the many coins of bronze, bones of animals, nuts, peach stones, boxwood draughts; 116 bone dice $\frac{7}{8}$ in. square, so numbered that the pips on two opposite sides always amounted to seven, which were found on clearing out the well to the depth of 17 ft. Space will not allow more than mention of the "Argentarius Novas," "The Portico of Caius and Lucius," "the Basilica Porcia," "the Maenian Balcony," "the Basilica Æmilia," "the Cloaca Maxima," "the Regia," "the Fons Juturna," and "the Spring of Juturna," all of which were described together with the discoveries that had been made in each instance.

ANTHROPOLOGICAL INSTITUTE. — At the January meetings Mr. Gowland described the work recently done at Stonehenge, which has already been reported in the *Builder*. Mr. A. L. Lewis exhibited a view of Stonehenge from a manuscript dated 1588, in which the leaning stone was represented, showing that the fall of the central pilithon was not caused as has been generally thought, by the digging by the Duke of Buckingham in 1620, but had probably taken place at a much earlier date. Mr. Lewis also exhibited lantern-slide views of the standing stone at Rudston, Yorkshire, which is over 25 ft. above ground, and more than 16 ft. below ground—how much more no one knows—and stands therefore more than 4 ft. higher than the largest stone at Stonehenge. Dr. T. H. Bryce also described his excavations among the prehistoric cists in the Isle of Arran; his researches tending to show that these belong to the Late Stone and Early Bronze Ages.

HOSPITAL, LEEDS.—The Sanitary Committee of the Leeds City Council, at a meeting on the 28th ult., accepted, subject to the approval of the Council, tenders for the erection of additional buildings on the site of the City Hospital at Seacroft, at an estimated cost of 107,500*l.* Designed by Mr. E. T. Hall, architect, of London, the new hospital will be on the pavilion system, and consist of twenty-six blocks, somewhat similar to those of which the existing hospital is composed. A question under the consideration of the Committee was whether it was advisable to let the contract to one firm, or to allot the various sections of the work to specified contractors. The Committee decided to let the general contract to Messrs. Harold Arnold & Son, of Leeds and Doncaster, whose estimate was 170,800*l.*, and to accept the estimate of Messrs. H. Braithwaite & Co., Leeds, for the plumbing work, at a cost of 18,700*l.*

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ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—The first ordinary meeting of the Society of Engineers for the present year was held on Monday evening, February 3, at the Royal United Service Institution, Whitehall. Mr. Charles Mason, the President for 1901, first occupied the chair, and presented the premiums awarded for papers read during that year, viz.:—The President's Gold Medal to Mr. H. Alfred Roechling for his paper on "The Sewage Question during the Last Century"; the Bessemer premium of books to Mr. Roger G. Hetherington for his paper on "The Main Drainage of Ilford"; a Society's premium of books to Mr. Arthur T. Allen for his paper on "Concrete Subways for Underground Pipes"; a Society's premium of books to Mr. Sydney A. Hollis for his paper on "Preliminary Investigations for Water Supply," and a Society's premium of books to Mr. J. Freebairn Stow for his paper on "Irrigation Works in South Africa." Mr. Mason then introduced the President for the present year, Mr. Percy Griffith, to the meeting, and retired from the chair, receiving a hearty and unanimous vote of thanks for his services during the past year. The President then proceeded to deliver his inaugural address, in the course of which he dealt with some of the broader aspects of the question of water supply in this country, pointing out that even at the present time there were many towns and districts without any public supply whatever, and others in which the supply was very deficient. The causes of this state of affairs were then indicated as being the very imperfect system of control and allotment of responsibility, the irregular and haphazard selection of areas of supply, the peculiar characteristics of the country generally, and the present system for allocating the various available sources of supply. He then pointed out the unsatisfactory effects of the rivalry existing in many places between local authorities and water companies, and suggested some limit being placed on the power of the former to interfere with or oppose the latter. The concentration of the population in the large cities and the consequent increase in the demand for water in such cases, and the growing practice of seeking new sources at long distances from the area to be supplied, were then remarked upon. After pointing out a few elements of risk connected with long conduits, Mr. Griffith suggested that local sources of supply should in every case be developed to their utmost capacity before large gravitation schemes were undertaken. The difficulties attaching to underground sources were then referred to, the condition of the water supply in the county of Essex being quoted as an illustration. As representing modern practice in regard to deep borings, descriptions were given of the boring recently completed at Gainsborough, which was the largest in the kingdom, and that recently commenced at Lincoln, which was intended to be 700 ft. deeper, both under the supervision of the President. Attention was called to the modern practice of dispensing with wells and pumping direct from borings, and to the necessity for special attention being given to the design of the pumping machinery in such cases, an illustration being given from actual practice. The President dealt with the newly-imported American system of lifting water by compressed air, and pointed out its advantages and disadvantages, expressing his opinion that the system was not applicable to any cases where the ordinary form of pump could be used. In connexion with gas engineering, the President refrained from dealing with the details of manufacture on the ground that they had been fully discussed and described in the transactions of the various gas institutions; and, after remarking upon the great benefits conferred on the gas industry by the introduction of electric lighting, proceeded to describe the present position and future prospects of the system of incandescent gas lighting. Under this head, Mr. Griffith ventured to forecast the possibility of illuminating power in gas being ultimately subordinated to calorific power, and pointed out the vastly increased scope for the gas industry afforded by the reduction in cost of manufacture which such a change would bring about. Having remarked upon the enormous lighting efficiency of coal gas rendered possible by the incandescent burner (40 c.p. per cubic foot of gas per hour as against 3 candles per cubic foot with the argand burner), the President strongly urged the necessity for extending the practice of superintending consumers' fittings at reasonable rates. In conclusion, Mr. Griffith referred to the remarkable advances made by the introduction of high-pressure lighting for external purposes, and briefly described the work done in this connexion by Mr. William Sugg, the Welsbach Company, and Mr. Scott-Snell. A description of the automatic air pump or pressure-intensifier, which is operated entirely by the waste heat from the burners, invented and recently much improved by the last named, then followed, and a reference to the inverted incandescent lamp, also recently introduced, concluded the address.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Norwood.—The erection, at the private entrance to a bank building to be erected on the west side of Norwood-road, Norwood, of a brick porch to abut upon Ulleswater-street (Messrs. W. G. Bartleet & Son for the London and County Banking Co., Ltd.). —Consent.

Hampstead.†—A block of residential flats on the northern side of Finchley-road, Hampstead, at the corner of Heath-drive (late West Hampstead-avenue (Mr. J. Reynolds).—Consent.

City.—An iron and glass shelter at the entrance to the Great Eastern Hotel, Liverpool-street, City (Mr. T. Holloway for Messrs. Maple & Co., Ltd.)—Consent.

Kensington, South.—An enclosed brick porch in front of Block 4 of the residential flats in course of erection on the east side of Marloes-road, Kensington (Mr. C. F. Kearley).—Consent.

Greenwich.—Five houses, with one-story shops in front, on the east side of Woodlands-road, Blackheath, southward of No. 1 (Mr. P. Barnett).—Consent.

Hackney, North.—Buildings on a site on the north-west side of Oldhill-street, Upper Clapton, between Stamford-grove East and Stamford-grove West (Mr. G. S. Garey for Mr. W. E. Stevens).—Consent.

Hampstead.—A timber-framed porch and vestibule at the entrance to a house in course of erection on the north side of Elsworthy-road, Hampstead, to be known as Shepherdswell (Mr. A. F. Faulkner for Mr. W. Willett).—Consent.

Hampstead.—The erection in front of No. 143, Haverstock-hill, Hampstead, of a two-story bay window with a balcony projecting therefrom on the ground floor (Mr. B. Pite for Mr. W. R. Rider).—Consent.

Lewisham.—That the application of Mr. R. Cruwys for an extension of the periods within which the rebuilding of the Two Brewers public-house on the west side of Perry-hill, Catford, at the corner of Clarens-road, and the erection of four houses with shops on the west side of Perry-hill, adjoining such public-house, were required to be commenced and completed, be granted.—Agreed.

St. George, Hanover-square.—An open portico, with a balcony cover, in front of No. 13, Charles-street, Berkeley-square (Mr. R. G. Hammond for Mr. J. Garlick).—Consent.

Kennington.—Retention of a one-story shop on part of the forecourt of No. 2, Union-road, Clapham-road (Mr. R. W. Crawley for Mr. J. Mayo).—Consent.

Streatham.—A church vestry and lecture-hall on a site on the north side of Mitcham-lane, Streatham, abutting upon Welham-street (Mr. C. W. Vick for the London Baptist Association).—Consent.

City.—A steel and glass shelter over the entrance to the Ship and Turtle, Nos. 120 to 132, Leadenhall-street, City (Messrs. Colls & Sons for Messrs. Pimms).—Refused.

Holborn.—An iron and glass sign to overhang the public way in front of Nos. 37 and 39, Farringdon-road, Holborn (Messrs. Hereford, Lavey, & Chapman).—Refused.

Kensington, North.†—An iron and glass shelter in front of Ladbroke Hall, No. 124, Ladbroke-grove, Kensington (Mr. M. J. Zimmermann for the Directors of the Ladbroke Co., Ltd.).—Refused.

Kensington, South.†—An addition, to be used as a larder, on part of the forecourt of No. 23, Victoria-road, Kensington (Messrs. Holdstock & Mould for Mrs. B. E. L. Porter).—Refused.

Lewisham.—Two houses, with one-story shops in front, on the east side of Rushey-green, Catford, at the corner of Ringstead-road, and the erection of four houses, with one-story shops in front, on the south side of Ringstead-road (Messrs. Norfolk & Prior for Mr. C. C. Story).—Refused.

Width of Way.

Islington, North.—A building on the north-east side of Pine-grove, Tollington Park, Holloway, with the boundary wall of the forecourt at less than the prescribed distance from the centre of the roadway of Pine-grove (Messrs. Downer & Johnson for Mrs. E. Clay).—Consent.

Woolwich.—Rebuilding of Nos. 16 and 17, Wellington-street, Woolwich, with the external wall of the rear portion of the proposed building at less than the prescribed distance from the centre of the roadway of Love-lane (Mr. H. P. Monckton for Captain R. A. Ogilby).—Consent.

Hampstead.—A shed on a piece of ground on the east side of Grove-place, Hampstead, at less than the prescribed distance from the centre of the roadway of that street (Messrs. E. Drake & Son for Mr. F. Dashwood).—Consent.

Space at Rear.

Southwark, West.—A modification of the provisions of Section 41 (1) of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of two cottages to be erected on the site of Nos. 28, 29, and 30, Ufford-street, Lambeth, with irregular open spaces at the rear (Messrs. Clutton for the Ecclesiastical Commissioners).—Consent.

Wandsworth.—A modification of the provisions of Section 41 (1) (vi.) of the Act, with regard to open spaces about buildings so far as relates to the proposed erection of a house on the south side of Oak Hill-road, Wandsworth, with an irregular open space at the rear (Mr. A. Leather for Mr. J. Green-street).—Consent.

Bermondsey.—The formation of dwelling-rooms on the first floor of No. 2, Leroy-street, Old Kent-road (Mr. C. M. Quilter for Messrs. Battley, Sons, & Holness).—Refused.

Width of Way and Lines of Frontage.

Hampstead.—The retention of a greenhouse on the north side of College-villas-road, Hampstead (Mr. R Morris for Mr. F. Debenham)—Consent.

Hampstead.—The retention of a greenhouse on the north side of College-villas-road, Hampstead (Mr. R. Morris for Mr. F. Debenham).—Consent.

Woolwich.—The rebuilding of 59, Wellington-street, and No. 1, Brewer-street, Woolwich, with the external walls of the new building at less than the prescribed distance from the centre of the roadway of Brewer-street (Mr. H. P. Monckton for Captain R. A. Ogilby and Mr. W. E. Champion).—Refused.

Formation of Street.

Marylebone, East.†—That an order be issued to Mr. F. J. Stevenson, sanctioning the formation or laying out of a new street for carriage traffic, to lead from High-street, Regent's Park, into Lower William-street (for Lord Howard de Walden).—Consent.

Cubical Extent.

Battersea.—The erection on the site of Nos. 1, 3, 5, and 7, Kamballa-road, Battersea, of a building to exceed in height the width of Kamballa-road, to exceed in extent 250,000 but not 450,000 cubic feet, and to be used for the purposes of stables, van-house, and furniture depository (W. Thornicraft for Messrs. Arding & Hobbs.)—Refused.

Finsbury, East.—A building on the site of No. 73, Golden-lane, Finsbury, to exceed in extent 250,000 but not 450,000 cubic feet, and to be used for the purposes of the trade of a mantle and blouse manufacturer (Messrs. Joseph, Son, & Smithem for Mr M. Bromet).—Refused.

Cubical Extent and Construction.

Poplar.—One-story wood and iron open shed addition to the rope works, Glengall-road, West Ferry-road, Millwall (Mr. R. C. Murray for Messrs. J. & E. Wright, Ltd.).—Consent.

Separation of Buildings.

Fulham.—The omission of a fire-resisting floor at the first floor level of No. 201 (formerly No. 85), North End-road, Fulham (Mr. J. P. Flew, jun.).—Refused.

City.—That the Council do make no order with respect to the application of Messrs. Aston Webb and E. Ingress Bell on behalf of the Metropolitan Life Assurance Society, for consent to the formation, at the first floor level, of two openings in the party-wall between Nos. 13 and 15, Moorgate-street, City. —Agreed.

*** *The recommendations marked † are contrary to the views of the local authorities.*

BOOKS RECEIVED.

THE FACTORY ACTS. By the late Alexander Redgrave, C.B. Eighth edition; revised by H. S. Scrivener and C. F. Lloyd. (Shaw & Sons; and Butterworth & Co.)

THE WIREMAN'S POCKET-BOOK. Edited by C. Raphael. (The *Electrician* Publishing Co. 5s.)

RESIGNATION OF AN ARCHITECT.—On the 3rd inst., at the meeting of the Northumberland Standing Joint Committee at Newcastle, the resignation was accepted of Mr. Cresswell, who has been County Architect since 1879. It was agreed to recommend the County Council to give Mr. Cresswell, so far as they are able, pecuniary recognition of his long services.

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The Student's Column.

PART II.—DRAINAGE.

CHAPTER 6.—HYDRAULICS.

THE FLOW OF SEWAGE IN DRAINS.—The quantity of sewage (not under pressure) which a drain will discharge depends upon the inclination and diameter of the drain, the nature of the interior surface (whether smooth or rough), the number of bends and their degree of curvature, the depth of the flow, and to some extent also upon the nature of the sewage itself. Numerous formulas have been devised for calculating the velocity of the flow in drains and the amount of sewage which they are capable of discharging, but the results obtained are so discrepant as to throw doubt on them all. The formula devised by two Swiss engineers, Kutter and Ganguillet, and subsequently simplified by P. J. Flynn, an American engineer, is now generally accepted as one of the most accurate. It takes into consideration the diameter and inclination of the drain, the nature of the surface, and the depth of the flow. The formula itself is of a complicated nature, and need not be given. The following table, compiled from the valuable tables in Colonel Moore's "Sanitary Engineering," gives the velocity and discharge of sewage in stoneware pipes from 2 in. to 12 in. in diameter, running full, for slopes ranging from 1 in 10 to 1 in 150; the figures are calculated from Kutter and Ganguillet's formula:—

TABLE I.

Velocity and Discharge of Sewage in Circular Stoneware Drains, Flowing Full. V. = *Velocity in Lineal Feet per Second;* D. = *Discharge in Cubic Feet per Second.*

Fall.	1 in 10.		1 in 15.		1 in 20.		1 in 25.		1 in 30.		1 in 35.		1 in 40.		1 in 45.	
Internal Diameter in inches.	V.	D.	V.	D.	V.	D.	V.	D.	V.	D.	V.	D.	V.	D.	V.	D.
2	3·197	·0697	2·610	·0569	2·260	·0493	—	—	—	—	—	—	—	—	—	—
3	4·517	·2217	3·687	·1810	3·193	·1567	2·855	1401	2·606	·1279	2·412	·1184	2·256	·1107	—	—
4	5·743	·5011	4·688	·4091	4·059	·3542	3·630	·3168	3·313	·2891	3·067	·2677	2·869	·2503	2·704	·2360
5	6·895	·9402	5·629	·7675	4·874	·6646	4·359	·5944	3·979	·5425	3·684	·5022	3·445	·4697	3·247	·4428
6	7·999	1·568	6·523	1·280	5·648	1·108	5·052	·9919	4·611	·9054	4·268	·8381	3·992	·7838	3·763	·7389
7	—	—	7·377	1·971	6·388	1·707	5·712	1·527	5·214	1·303	4·827	1 200	4·514	1 206	4 256	1·137
8	—	—	8·196	2·861	7·097	2·477	6 348	2·215	5·794	2·022	5·363	1·872	5·016	1·751	4 729	1 650
9	—	—	—	—	7 782	3·438	6·969	3·075	6 353	2 806	5 881	2 508	5·500	2·430	5·185	2 290
12	—	—	—	—	—	—	8·704	6·830	7 920	6 225	7·338	5·763	6 863	5·390	6 470	5 082

Fall.	1 in 50.		1 in 60.		1 in 70.		1 in 80.		1 in 90.		1 in 100.		1 in 125.		1 in 150.	
Internal Diameter in inches.	V.	D.	V.	D.	V.	D.	V.	D.	V.	D.	V.	D.	V.	D.	V.	D.
4	2·565	·2238	2·341	·2043	—	—	—	—	—	—	—	—	—	—	—	—
5	3·081	·4200	2·811	·3833	2 602	·3548	2·433	·3318	2·293	·3127	—	—	—	—	—	—
6	3·569	·7009	3·258	·6397	3·015	·5920	2·820	·5537	2·658	·5218	2·521	·4950	2 253	·4424	—	—
7	4·037	1 078	3 684	·9847	3·410	·9114	3·189	·8523	3·006	·8034	2·851	·7620	2 548	6811	2·325	·6215
8	4·486	1·505	4·094	1·429	3·789	1·322	3 544	1·237	3 340	1·166	3·168	1·106	2 832	·9886	2·584	·9021
9	4·919	2 173	4·489	1·983	4·155	1 835	3 886	1·716	3 663	1·618	3·474	1·535	3·106	1 372	2 834	1·252
12	6·138	4·820	5 601	4 399	5·186	4·072	4 849	3 808	4·570	3·590	4 335	3 405	3·876	3 044	3 537	2 778

The figures given in this table are for pipes flowing full, but in actual practice drain-pipes are seldom charged to half their depth, and the figures must therefore be corrected for different depths of flow. Table II. (from Wollheim's "Sewerage Engineer's Notebook") gives the proportionate values of velocity and discharge for circular drains with different depths of flow. It is based on Kutter's formula, and the values given are the averages for a number of different sizes of pipes, and are sufficiently correct for all practical purposes.

TABLE II.

Proportionate Values of Velocity and Discharge of Circular Sewers with Different Depths of Flow.

Depth.	Velocity.	Discharge.
1·0 (full)	1·00	1·00
·90	1·14	1 08
·80	1·15	·95
·75 (¾ full)	1·14	·92
·70	1·12	·84
·60	1·08	·68
·50 (½ full)	1·00	·50
·40	·89	·33
·30	·75	·19
·25 (¼ full)	·66	·13
·20	·57	·08
·10	·34	·02

The maximum velocity (according to Kutter's formula) occurs when the depth of the flow is four-fifths (really ·81) of the diameter of the pipe, and the maximum discharge when the depth of the flow is thirteen-fourteenths (really ·93) of the diameter. The velocity is the same whether the pipe is flowing full or half full, as in both cases the wetted perimeter of the pipe (and therefore the friction) bears the same ratio to the sectional area of the flow. If the pipe is one-fourth full, the velocity of the flow is only two-thirds that of the full or half-full pipe.

The Incline of Drains.—The by-laws adopted by different sanitary authorities do not help us much in the matter of drain-slopes. In many cases, as in the "model by-laws" (both urban and rural), they merely state that drains must be laid "with a proper fall," and as opinions differ as to what is a proper fall, there is considerable diversity in practice. In the new London Drainage By-laws (1901) the words "with a suitable fall" are employed, but some of the defunct vestries in their regulations specified the smallest inclines which would be allowed. In the parish of St. George (Hanover-square), and in Poplar and Holborn, it was 1 in 80; in Paddington and in the Parish of SS. Margaret and John (Westminster), 1 in 60; in Islington, 1 in 40 "where practicable," but in no case less than 1 in 60; in Shoreditch, Lambeth, and Wandsworth, 1 in 48; in Newington, Battersea, Hammersmith, St. Luke (Middlesex), Whitechapel, and Chelsea, 1 in 40; in Fulham and Mile-end old Town, 1 in 40 for 6-in. pipes and 1 in 30 for 4-in. pipes; in Bermondsey and the district of St. Saviour and Christ Church, 1 in 30; in St. Martin-in-the-Fields, 1 in 40, or, if this gradient cannot be obtained, automatic flushing apparatus must be provided; and in Rotherhithe, 1 in 50, or with automatic flushing apparatus. The Board of Education specifies that "the fall should never be less than 1 in 30 for 4-inch, and 1 in 40 for 6-inch drains" from water-closets.

Obviously these regulations are not of much service in our inquiry. The slopes allowed range from 1 in 30 to 1 in 80, and many of them are certainly quite inadequate.

The flow of sewage (apart from rainwater) in branch drains is usually very small. The waste-pipe from an ordinary lavatory basin is, say 1¼ in. in diameter, and the sectional area of the pipe is 1·227 square in. Even if we have two lavatory wastes, or one lavatory waste and one sink waste of this diameter discharging over the same gully, the combined areas of the pipes will be only 2·454 square in. The sectional area of the flow in a 4-in. pipe running one-fourth full (fig. 1) is practically the same, namely, 2·464 square in. Of course, the discharges from the lavatory and sink will be under pressure, and consequently at a greater velocity than the flow in the drain, and a slightly greater area of flow will therefore be required in the latter to carry away the discharges, but the increased depth from this cause will only be small.

If we consider (as another example) a water-closet with a two-gallon cistern discharging its contents through a flush-pipe 1½ in. in diameter, we have the same area of pipe as before (1·227 square in.), and the two gallons will be discharged through the basin in about six seconds. This is at the rate of ·0535 cubic ft. per second. Assuming for the moment that a slope of 1 in 40 is sufficient for a 4-in. drain—this being the gradient commonly recommended in text-books—we turn to Table I. and find that a 4-in. drain of this slope discharges ·2503 cubic ft. per second when running full. The ratio between this and the rate of discharge from the closet will therefore work out thus:—·2503 : ·0535 :: 1 : ·21. From Table II. we learn that a relative depth of ·30 gives a relative discharge of ·19, and it is clear that the depth of flow in a 1-in-40 4-in. drain serving a single water-closet, flushed as described above, never (under normal circumstances) exceeds one-third of the diameter of the drain. In reality the depth would be somewhat less than this, varying with the velocity of the water on its entrance to the drain. In the case of a ground-floor or basement closet this velocity would, however, be small, and in any case the initial velocity would be gradually lost by the sewage in its passage through the drain.

This example may now be pursued a step further. We have a 4-in. drain with a gradient of 1 in 40, and a depth of flow equal to slightly more than three-tenths of the diameter of the drain. What is the velocity of the flow? Referring again to Table I., we find the velocity of the flow in a drain of this description, running full, to be 2·869 lineal feet per second. From Table II. we learn that the velocity, when the flow is three-tenths of the diameter, is three-fourths (·75) of the velocity when the pipe is full. The velocity of the flow in the drain now under consideration will therefore be 2·869 × ·75 = 2·15 lineal feet per second.

J. Bailey Denton was of opinion that ordinary sewage requires a mean velocity of 150 ft. per minute, or 2½ ft. per second, in order that deposits may not occur. Other engineers recommend a velocity of two miles an hour = 176 ft. per minute = very nearly 3 ft. per second. The former rate of flow is certainly *the least* which ought to be adopted in house drains, as the solid matter in the sewage is not so finely sub-divided as in sewers, and is therefore much more likely to produce deposits.

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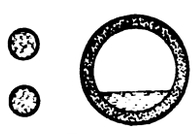

Fig 1.

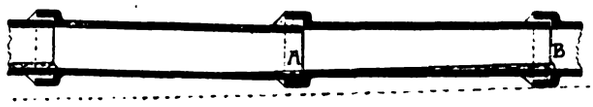

Fig. 2.

The velocity of 2·15 lineal feet per second attained in our typical water-closet drain is therefore inadequate, and we must either have a greater volume of flushing water discharged in the same time, or the drain must have a greater inclination.

Other factors influencing the flow of sewage in house drains may now be stated. In the first place, the flow is intermittent, and the last portion of each discharge drains slowly away, whatever may have been the velocity of the first portion. Every discharge leaves at least a thin film of sewage on the pipe, and unless the velocity of the next discharge is sufficient to scour this away, the deposit goes on increasing. Bends and junctions retard the flow of sewage to a very considerable extent, unless extra fall is given at these points. Intercepting traps are another source of trouble, and are often choked unless the velocity of the sewage is ample. The paper from water-closets is a very frequent cause of stoppage in house drains, and this also points to the necessity of quicker gradients; there would be fewer drain stoppages if householders provided a supply of "sanitary paper" of a kind easily softened and disintegrated by the flow of the sewage. Bad jointing of the pipes may also retard the flow and cause deposits, as shown in fig. 2, and a slight settlement of the drain at any point may have the same effects. Sand and pebbles washed from gravel paths are often deposited in drains of insufficient slope.

It is sometimes said that sewage flowing at a high velocity leaves the solids behind, and that a low velocity is therefore better. This is the sort of argument which can best be rebutted by practical experience. Every architect and sanitary engineer has known scores of drains which have been choked in consequence of inadequate fall, but the writer, in an experience of over twenty years, has not known one which failed because the gradient was excessive, and he has designed both drains and sewers with gradients of 1 in 10, and occasionally even steeper. The only valid objection to steep gradients is the excessive scour on the pipes, and it is for this reason better in such cases to adopt iron pipes. Domestic sewage has not, however, as severe a scouring action as sewage containing sand, pebbles, and other road detritus. A velocity of 6 ft. per second is often assumed to be the greatest which can safely be adopted for stoneware drains.

We are now in a position to state approximately the maximum and minimum gradients for stoneware house-drains, assuming that the minimum gradients must be sufficient to give a mean velocity of 2½ ft. per second when flowing one-third full, and that the maximum gradients must not produce under any conditions of flow a greater mean velocity than 6 ft. per second. Table III., based on Kutter's formula, contains the figures for drains from 3 in. to 9 in. in diameter, including the amount of sewage discharged per minute in each case.

The minimum gradients given in this table differ from those generally recommended. Many authors, following Maguire, say that a 4-in. drain should have an inclination of 1 in 40, a 5-in. 1 in 50, a 6-in. 1 in 60, and a 9-in. 1 in 90; but they also state that the velocity of the sewage ought to be 3 ft. per second when the drain is flowing only one-quarter full. Maguire's rule was based on Beardmore's formula, which is now almost universally discredited by sewerage engineers. Kutter's formula, which has rapidly come into general use, not only in this country, but also in the principal countries of Europe and in America, gives much lower results for small drains, and shows that the velocity of flow in a 6-in. drain with a gradient of 1 in 60 is far in excess of that in a 4-in. drain with a gradient of 1 in 40, and if the comparison is made between a 9-in. drain with a gradient of 1 in 90 and a 1 in 30 3-in. drain, the difference in the velocity is still more marked. The conclusion is obvious: if Kutter's formula is correct, the velocity in small stoneware drains, as ordinarily laid, is nothing like 3 ft. per second when the drains are flowing only one-fourth full. In Table III. we have based the calculations for minimum gradients on a mean velocity of 2½ ft. per second and a depth of flow equal to one-third of the diameter of the drain, but even with these less onerous requirements, the slopes of 4-in. drains must be 1 in 34 and of 5-in. drains 1 in 48. If the depth of flow is only one-fourth of the diameter, the gradients must be 1 in 24 and 1 in 34 respectively, in order to obtain the same velocity.

The co-efficient of roughness adopted in these calculations is ·013, which is Kutter's value for earthenware and stoneware pipes in good condition but not new. Quicker velocities will be obtained in new drains of glazed stoneware and iron, but it is always best, when dealing with such a variable liquid as sewage, to be on the safe side. The probability of defective workmanship and materials must also be borne in mind.

TABLE III.

Gradients for Stoneware Drains, and Amount of Sewage discharged per Minute.

Diameter of Drain.	Maximum. (V = 6 ft. per sec. flowing ⅓ full.)		Intermediate. (V = 2½ ft. per sec. flowing ½ full.)			Minimum. (V = 2½ ft. per sec. flowing ¼ full.)		
	Inclination.	Discharge in cubic feet per minute.	Inclination.	Discharge in cubic feet per minute.		Inclination.	Discharge in cubic feet per minute.	
				½ full.	full.*		¼ full.	full.*
Inches.								
3	1 in 7	15·10	1 in 15	1·41	10·86	1 in 21	2·19	9·17
4	1 ,, 12	26·07	1 ,, 24	2·52	19·39	1 ,, 34	3·91	16·29
5	1 ,, 17	41·69	1 ,, 34	3·97	30·57	1 ,, 48	6·17	25·72
6	1 ,, 23	58·91	1 ,, 45	5·76	44·33	1 ,, 65	8·84	36·87
7	1 ,, 30	79·40	1 ,, 58	7·80	60·00	1 ,, 83	12·04	50·20
8	1 ,, 37	103·79	1 ,, 72	10·17	78·24	1 ,, 102	15·76	65·70
9	1 ,, 44	132·01	1 ,, 86	12·90	99·50	1 ,, 123	19·91	82·98

* The greatest discharge occurs when the drain is not quite full, and is about 10 per cent. more than the figures here given.

We were surprised to find, however, on reading through the instructions, that the Council do not in any case intend to employ the successful competitor, but only to use his designs in any way they choose.

We also find that the premiums are for first, second, and third places for the *three sets complete*.

In an addendum, sent with the instructions, we were still more surprised to discover that, instead of the three sets of plans advertised, the Council were asking for *five*, without any increase of premium; that the work required comprised complete ⅛-in. scale plans, a section and two elevations, and plan of proposed drainage, with detailed specification and estimate, all the drawings to be mounted on strainers. But perhaps the clause that capped all was the following, on which we have no need to enlarge:—Clause 16. "The competitor whose set of designs, &c., is finally selected will be required upon request to furnish such information, free of cost to the Council, as may be required to enable quantities to be taken out, but *third class* travelling expenses (if any) incurred for this purpose will be allowed by the Council;" and Clause 15, before it, leaves the whole selection of the designs in the hands of the Housing Committee to the Council, who will assess the awards.

You will see, therefore, that the successful competitor obtains a "gratuity" for his pains at the rate of 10*l.* each for complete sets of working drawings, specifications, and estimates, and for dancing attendance on the quantity surveyor, 5*l.* apiece for the second complete set, and 40*s.* each for the third.

It will be, no doubt, within your knowledge that the Council from which all this emanates require their contractors to pay trades-union wages, and yet they propose in a scheme like this, involving an expenditure, even in the case of the most successful candidate, of a large part of the 50*l.* awarded him, everything being required free of the Council, barring only the insulting offer of "third-class travelling expenses (if any)" when all the ins and outs of his design are being dissected by the Council's quantity surveyor.

The second and third competitors ought to be thankful if their "out-of-pocket" expenses are somewhat met.

We feel, in troubling you, that this, if any, is a case to which the attention of the profession should be drawn in the columns of your journal.

T. B. & H.

Correspondence.

BATTERSEA WORKING-CLASS DWELLINGS COMPETITION.

SIR,—We venture to draw your attention to the instructions to competitors issued by the Battersea Borough Council, who invited architects to submit designs for three different types of working-class dwellings, for which premiums of 50*l.*, 25*l.*, and 10*l.* are offered. The drawings were to be sent in last week.

In your "Competition Summary" of December 14 these premiums were allotted to each type of building, so that if any one competitor secured first place in all three sections, he would be awarded a total of 85*l.* in premiums.

We also took it for granted, after reading the advertisement, that the successful competitor would be appointed architect in the usual way, the clause that "the Council do not bind themselves to carry out any design" being, we thought, the usual "saving" one.

We paid 5*s.* for the instructions, &c., on this understanding, thinking that there was a great deal more than the bare premiums attaching to the competition.

A SEWER OR A DRAIN.

SIR,—In the interesting article on "Drainage and Sewage Disposal" in the Student's Column of your issue of January 4 the author, in dealing with that vexed question "a drain or a sewer," quotes the nineteenth section of the Public Health Amendment Act of 1890, and goes on to cite a decision of Mr. Justice Cave in the case of "Lancaster *v.* Barnes Urban District Council," in which the learned Judge held that the nineteenth section above referred to, applied, and declared the sanitary authority entitled to recover the cost of repairing a conduit which took the drainage of four houses belonging to two different owners, and that it was a drain and not a sewer for the purpose of the nineteenth section.

The author of your article neglects to point out that the essence of the ruling was the condition of different owners. So far as concerns houses owned by the same owner, the Amendment Act of 1890 left the law unaltered. Hence in "Lancaster *v.* Barnes Urban District Council," had the four houses belonged to the same owner the decision must have been different.

In a footnote the author notes that the Public Health Act, 1875, "shall not extend to Ireland." I may mention that Ireland is dealt with under the Public Health (Ireland) Act, 1878, which is practically identical with the Act of 1875, and that the Amendment Act of 1890 also, I believe, applies equally to it.

R. M. BUTLER.

Dublin.

SIR,—It is perfectly clear from Section 19 of the Public Health Act Amendment Act (1890) that the definition there given of a "single private drain" applies only to a drain from "two or more houses *belonging to different owners*," and as the section was quoted in full, comment on this point was considered unnecessary. The case of Lancaster *v.* Barnes Urban District Council was quoted for the specific purpose of showing that it is not a sufficient plea "that neither owner could relay the part of the drain situate in the other's premises without committing a trespass." Whether a drain from "two or more houses belonging to different owners" is a single private drain or a sewer, is not, however, always as clear as your correspondent seems to think. This is shown by the number of cases which have been tried; if the law were clear on the point,

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litigation would be unnecessary. In delivering judgment in 1896 in the case of Eastbourne (Mayor, &c., of) *v.* Bradford, the Lord Chief Justice said:—"I cannot avoid pointing out the highly unsatisfactory state of the existing legislation relating to questions of public health . . . It is entirely unsystematic and most confused, and in the public interest steps ought to be speedily taken to reduce the existing chaos into system and order."

THE WRITER OF THE ARTICLE.

COMPETITIONS.

"SIR,—Has not your correspondent, "Assessor," taking perhaps (not unnaturally) an exaggerated view of the importance of an assessor's position, based his suggestions for the simplification of competition drawings on a false assumption?

Elaborate and attractive drawings are not meant so much to appeal to the assessor as to the body, building committee, or what not with whom the decision really lies, and who too often look on the appointing of an assessor as a mere concession to public or professional prejudice, and on his award as a matter of considerable indifference.

Given a guarantee that the assessor's award will be accepted as final, nothing could be more to the purpose than the suggestions made; but, under ordinary circumstances—well!

ALLEN FOXLEY, B.A.

USE OF ENAMELLED TILES IN ARCHITECTURE.

SIR,—With regard to Mr. Halsey Ricardo's recent lecture before the Society of Arts advocating an extended use of enamelled tiles or glazed work in London, and to your subsequent note on the lecture, and also to Mr. Ricardo's letter in your last issue, I write to suggest that a new building belonging to the "Nurses' Co-operation," in Langham-street, Great Portland-street, affords opportunity to judge of the effects produced by the reflection of light from a glazed-fronted building.

ARTHUR E. THOMPSON.

BUILDERS' ACCOUNTS.

SIR,—I noticed with pleasure your review of my book on the above subject appearing in your issue of the 1st inst. Your criticisms are perhaps rather severe, but I thank you all the more for that, as a candid practical opinion is extremely useful.

I should very much like to have the benefit of the opinions of your readers on the weak points in my "Builders' Accounts." With this object in view I should be greatly obliged to you if you would kindly open your columns to the criticisms of your readers on builders' book-keeping in general, and my book in particular, and to any of your readers who would take part in such discussion. Accordingly I will, with your permission, deal with one or two points already raised.

In dealing with the register of tenders you refer to my remark that this book is useful to see "in what respects his (the builder's) tender has been faulty," and suggest that instead of relying on such support as this, the builder should see that his estimating staff is efficient. Surely though, sir, such a book is useful in *proving* whether or not the estimating staff is efficient.

"Subbing" is undoubtedly a demoralising system, and I am sorry to have to recognise it. Yet the evil exists, whether I recognise it or not, and, in my opinion, it is better to provide a workable system of dealing with it rather than to allow it to be loosely conducted, and thereby increase the attendant danger of peculation by dishonest foremen, &c.

Thanks for your suggestion *re* having the accounts audited annually by a qualified firm of auditors.

I do not, at the moment, propose to encroach further on your space, but shall be glad to deal with the other points raised and any further ones which your readers may care to bring up, if you could favour me with an opportunity for doing so.

JOHN A. WALBANK, A.C.A.

WOODEN HOUSES.

SIR,—I shall be much obliged if I may ask in your columns how to obtain a prospectus of wooden houses supplied ready made from abroad.

C. B. D.

STREET IMPROVEMENTS, WOLVERHAMPTON.—On the 30th ult. Mr. W. A. Ducat, an Inspector appointed by the Local Government Board, held an inquiry at the Town Hall, Wolverhampton, respecting an application by the Town Council to borrow 17,555*l.* for paving purposes. The Town Clerk (Mr. Horatio Brevitt) explained the circumstances under which the application was made, and stated that a portion of the work had already been carried out without the consent of the Board, as it was absolutely necessary in connexion with the laying of the tramway. Mr. G. Green, the Borough Surveyor, having given evidence, the Inspector asked if there was any opposition, and there being no response, the inquiry ended.

GENERAL BUILDING NEWS.

CHURCH, FAIRHAVEN, LANCASHIRE.—On the 25th ult., Mr. H. W. Worsley-Taylor, K.C., M.P., laid the foundation-stone of a new church which is intended to meet the requirements of the district of Fairhaven, near Lytham. The new church will be known as St. Paul's, and will cost between 6,000*l.* and 7,000*l.* The architect is Mr. Medland Taylor, of Manchester.

CHURCH, CAMBERLEY, SURREY.—A new church is being erected at Camberley, dedicated to St. Paul. Mr. W. D. Caröe is the architect, and the building contract has been given to Messrs. Martin Wells, and Co., of Aldershot. The cost of the part of the building at present contracted for will be about 2,200*l.* The portion now being built consists of the whole of the west end, or nave, right up to the choir. The seating accommodation of the whole building, when erected, will be for about 500, while the capacity of that portion now being built is for about 310 people.

BAPTIST CHURCH, PORTSMOUTH.—It is proposed to erect a Baptist Church in the London-road, Portsmouth, and the contract has been placed in the hands of Mr. J. W. Perkins, builder, of Fratton. The plans have been prepared by Mr. John Wills, architect, of Derby and London. The proposed new church is to be 67 ft. by 44 ft. on the ground floor, and will have a gallery length of 79 ft. Accommodation is provided in the church for 750 adults, or a mixed congregation of 1,000 persons. There are two vestries, one for the minister and one for the choir. There are also three cloakrooms, one being at the front end and two at the rear next to the vestries. The walls are to be brick with stone dressings. The cost will be about 4,000*l.*

NEW CHURCH, CORSLEY HEATH.—On Saturday last the Marquis of Bath laid the foundation stone of a new district church at Corsley Heath, near Warminster, Wilts. The work, estimated to cost about 4,000*l.*, is being carried out by Messrs. Burgess, builders, of Westbury, Wilts, from plans prepared by Mr. W. H. Stanley, architect, Trowbridge.

METHODIST CHAPEL, BULWELL, NOTTS.—On the 1st inst. the new Methodist New Connexion Chapel, erected on the Broomhill-road, Bulwell, was opened. The total cost of the new building and the site will be about 1,400*l.* The architect of the new chapel was Mr. J. R. Swift, Arnold, and the builders were Messrs. Pipkin & Ingham. The new building for the present will serve in the dual capacity of a school and church. It is built of red brick and Bridgwater tiles. There are two main entrances, one on either side, whilst admittance can also be gained from the rear. Adjoining the chapel there is a kitchen, with heating chamber. The school portion of the building is separated from the remainder of the edifice by Messrs. Peace & Norquoy's patent folding screen.

MISSION CHURCH, ALLENDALE, NORTHUMBERLAND.—The Bishop of Newcastle attended recently at St. Paul's, Catton, a village near Allendale Town, to dedicate and open a new mission church. The style of the new church is Early English, and the architects were Messrs. Hicks & Charlewood. The contractors for the stone and woodwork were, respectively, Messrs. William Milburn and John William Glenwright, of Allendale; the seating being of pitch-pine and supplied by Messrs. R. J. Porteus & Co., of Newcastle. The building is estimated to accommodate 150.

CHURCH, CLEVELAND, YORKSHIRE.—On the 1st inst., St. Matthew's new church at Grangetown, near Redcar, was consecrated. The church is built of brick, with the exception of the pillars and the arches in the arcades and the panel over the principal entrance, which are of stone. It is designed in the Early English style. The whole of the seen woodwork in the roof is of pitch-pine. The roofs are covered with Messrs. Green's patent red Boroughbridge tiles, and the walls are left unplastered on the inside. An octagonal bell turret is placed at the north-west corner of the nave, approached by a circular staircase, and finished on top with a wooden spirelet covered with copper. The principal entrance is from the south, and consists of two doorways with a stone panel or tympanum above under one arch. When finished the panel will contain a central figure of Our Lord, with emblems of the four evangelists placed on either side. A porch screen is provided within. The plan consists of a lofty nave and chancel, the combined length being 112 ft., north and south aisles, chancel aisle, vestries, and organ chamber, with heating cellar below. The width of the chancel, including nave and aisles, is 46 ft. The heating is by Messrs. Dinning & Cooke, of Newcastle-upon-Tyne, and is on the low-pressure system. The lighting is of gas, chiefly from pendants hanging from the roofs, all of wrought iron. The cost of the building when completed will be about 5,000*l.*, Mr. G. M. Ridge, of Normanby, being the builder. Messrs. Hicks & Charlewood, of Newcastle, are the architects.

NATIONAL SCHOOLS, HADLEIGH.—The new Girls' and Infants' National Schools at Hadleigh are approaching completion. The architect is Mr. A. H. Ryan-Tenison, of Westminster, and the style adopted is "Modern Elizabethan with half-timber work on the north, south, and east faces," a large proportion of the timber used being oak taken from an old malting-house of the fifteenth century, recently pulled down in George-street. The chief entrance is on the west side adjoining the playground. This was done to permit all the entrances being on the sunny side. The plan provides accommodation for 130 girls and 125 infants, and consists of conjoint entrances, with cloakrooms on either side, beyond which is the stock and store-rooms on the right-hand side and the mistresses' room on the left. The entrance lobby consists of a marching corridor, 40 ft. long by 10 ft. wide, at either end of which, on the left-hand side, is the girls' schoolroom and classroom, and on the right hand the infants' rooms. The dimensions of the girls' schoolroom are 47 ft. by 22 ft., the infant school 31 ft. 6 in. by 22 ft., and the two classrooms 20 ft. by 22 ft. A screen is to be provided in the girls' main room to provide classrooms. All the flooring is of pitch pine wood blocks. The entrance lobby and cloakroom are floored with terrazzo mosaic by the Artistic Tile Company. The external work consists of a dado of red brick, with stone moulding, otherwise rough cast. The frontage, which faces Threadneedle-street, is about 90 ft. The contractors were Messrs. Downs & Stephenson, Hadleigh.

QUAKER SCHOOLS, BOOTHAM, YORKS.—On the 30th ult. additions to the Friends' Boys' School at Bootham were opened. Part of the addition to the school buildings is a library which has been dedicated to the memory of John Bright, who was a scholar at the York Friends' School. The new block includes a laboratory, a lecture-room, an observatory, a gymnasium, workshops, classroom, and, as stated, a library. The architects for the new block of buildings are Mr. William Henry Thorp and Mr. Frederic Rowntree.

ST. CYPRIAN'S CHURCH, MARYLEBONE.—Lord Portman has sold a site for the new church which will replace the mission church opened in Park-street, between Dorset-square and Upper Baker-street, in 1866. The plans and designs for the new fabric have been prepared by Mr. J. N. Comper, of the firm of Messrs. Bucknall & Comper.

THE NORFOLK COUNTY SCHOOL BUILDINGS.—It is stated that Mr. R. H. Hill has been appointed architect for the conversion of the buildings for purposes of a naval training college for boys. The County School was erected on an elevated site of fifty acres near the river Wensum, at North Elmham, in 1873-4, after the Domestic Gothic style a chapel, of Bath stone, in the Early English style, being added ten years afterwards. The County School was closed in July, 1895.

MEDICAL MISSIONARY SOCIETY PREMISES, EDINBURGH.—Additions are to be made to the premises of the Edinburgh Medical Missionary Society in Cowgate. Some time ago the directors acquired the area of ground adjoining their present building from the Corporation so as to utilise it for additional accommodation. The plans have been approved by the Corporation and by the Dean of Guild Court, and a commencement will shortly be made. The new wing has a frontage of about 100 ft. to the Cowgate, and on the ground floor there has been arranged a new dispensary, waiting-room, consulting-room, lecture-room, and three shops; on the upper floors there is a reception-room, library, working men's club (consisting of a reading-room, gymnasium, and caretaker's house), the remaining apartments being used as students' bedrooms in connexion with the Livingstone Residence. The hall for meetings, Sunday-school, &c., in the existing building is to be enlarged, and slight alterations made on the vaccination-room, dining-room, and study. Mr. Marwick is the architect to the Society.

IMPROVEMENTS AT COVENTRY STATION.—A commencement has been made with the improvements at the London and North-Western Railway Station at Coventry. It is understood that a sum of 25,000*l.* will be expended by the company on the various works of improvement which they propose carrying out, and in the preparations for which Messrs. Parnell & Co., of Rugby, the contractors, have now a considerable body of men at work. The chief improvements will be on the up-platform side. The platform will be considerably widened, and the present roofed-in space used for cab-stands will be appropriated and used in connexion with booking and telegraph offices, refreshment-room, and other increased facilities for the travelling public.

MARKET EXTENSION, BRADFORD.—The Markets and Fairs Committee of the Bradford Corporation having determined to proceed with the extension of the Rawson-place Market, including the erection of an hotel to take the place of the "Jolly Butchers" Inn, have decided to advertise for tenders for the various works. The plans on which the building is to proceed are practically identical with those approved by the Committee in 1899. On this date the design of Messrs. T. C. Hope & Son, Bradford, was finally selected after competition. It provides for a series of ten shops facing Rawson-square, Northgate, and James-street, and the hotel at the corner at present occupied by the "Jolly Butchers," the whole enclosing an extension of the present market-hall. The principal front, with the main entrance, is in Northgate, and there is a second entrance from Rawson-square. Over the Northgate entrance, which is in the centre of the façade, there is a tower bearing a dome, and at each corner of the building are similar towers, which are carried to a greater height and similarly finished. In James-street, and at the entrance to

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the market from Rawson-square, staircases give access to a balcony running round the interior of the market on three sides, at the level of the first floor of the outside shops. The balcony will communicate with the rear of the shops and also with the hotel. It is designed to be 9 ft. wide, constructed of concrete and steel, and carried by steel cantilevers. A hydraulic lift is provided for the convenience of shop tenants and of the hotel. The shops have upper floors and attics, which overlook the streets and the roof of the market hall. All the shops have windows and doors to the street and to the market, and are self-contained. The hotel has a frontage of 50 ft. to Northgate and 30 ft. to Rawson-square. There is a hydraulic or electric lift for passengers or light luggage from the basement to the second floor. There is a large basement under the market hall, which is designed to be used principally for storage purposes. It is proposed that the walls of the market from the balcony to the eaves should be of glazed brickwork, and the market floor would be of concrete. The total cost is estimated at 25,000*l*.—*Yorkshire Observer*.

PROPOSED ENLARGEMENT OF LINCOLNSHIRE ASYLUM AT BRACEBRIDGE.—An inquiry was conducted by Colonel A. G. Durnford, R.E., at Lincoln, recently, into the application by the Lindsey and Holland County Councils, the Grimsby and Lincoln Town Councils, for sanction to borrow 33,074*l*., 17,000*l*., 10,370*l*., and 9,532*l*. for the purpose of enlarging the County Asylum at Bracebridge. Mr. W. T. Page, Clerk to the Asylum Visitors, stated the construction of the present asylum commenced in 1847, and the building was enlarged several times to accommodate 680. That was the extent of the accommodation for which the present buildings made provision, but on January 9 the number of inmates in the asylum was 742—357 males and 385 females—and, in addition, twenty-five patients were being boarded out at Newcastle-on-Tyne Asylum and twenty-five at the Leicester Borough Asylum. Accommodation would be provided for 1,000 persons, including attendants. Mr. Gough gave evidence as to the proposed additions, and the inquiry then closed.

A PUBLIC HALL AND CITY SQUARE FOR HULL.—Within a day or two the Hull Corporation will obtain possession of all the property bounded by Waterworks-street, Junction-street, St. John-street, and Chariot-street, and no time will be lost in clearing the area, which is to afford a site for a large public hall and thirty-four shops, and also to provide a city square, by throwing 1,000 square yards into the existing streets near the Wilberforce Monument. Yesterday Mr. Hirst, the City Architect, submitted, at a meeting of the Corporation Property Committee, a plan which he had made of the public hall. It was most favourably received, and ordered to be submitted to the City Council for their approval. The elevation plan shows a square, well-balanced frontage of rather imposing proportions, and crowned with a dome, which will harmonise with the domes of the Dock Offices on the opposite side of the square. The approximate estimate for erecting the buildings, including the purchase of land, is 92,000*l*. The estimated rentals from the new shops (including two licensed houses to be rebuilt) is 6,836*l*., and from the public hall about 1,000*l*. It is expected that the increased rental and rates will cover the amount required for interest and sinking fund upon an expenditure of 92,000*l*. calculated upon a 3 per cent. basis—*Yorkshire Post, February* 1.

EXTENSIONS AT THE DERBY POST OFFICE.—A grant of 4,000*l*. having been obtained for the purpose of making extensions and introducing improvements at Derby Post Office, the work has just been commenced, the contract having been let to Messrs. Williamson & Son, of Nottingham. There will be two new entrances for the public from St. James's-street. The instrument-room will be enlarged in order to provide additional accommodation for the operators. Further additions are contemplated in reference to the branch postal establishment in Midland-road.

TOWN HALL, LEIGH.—Mr. W. O. E. Meade-King, M.Inst.C.E., on behalf of the Local Government Board, held an inquiry last week at the Town Hall, Leigh, Lancashire, respecting the application of the Corporation for a loan of 50,803*l*., 9,025*l*. being for the formation of new streets in the Borough, and 50,778*l*. being the estimated cost of proposed new Town Hall and site. Mr. Tom Hunter, the Borough Engineer, attended the inquiry in support of the application for a loan for street works, and Mr. J. C. Prestwich, architect, of Leigh, on behalf of the Corporation, in the application of 50,778*l*. for the new Town Hall.

FOREIGN.

FRANCE.—The municipality of Lilas have opened a competition for the construction, on the Place Paul de Kock, of a large Salle des Fêtes, at an estimated cost of 400,000 francs.——A committee has been formed in Havre to consider a scheme for extensive works of improvement in the port. The project, on which it is proposed to spend eight million francs, includes the formation of a lock between the Bellot dock and the Tancarville canal, and of a railway station at the extremity of the canal.——The Gobelins manufactory has commenced work on a large tapestry, from the cartoons of M. Toudouze, intended as a decoration for the Salles des Etats-Généraux at Rennes. The subject is the marriage of Charles VIII. with Anne of Brittany.——A fine antique marble statue of Minerva has been discovered at Poitiers, beneath the basement of the ancient Hôtel de Lusignan. It has been placed in the local museum.——The annual art exhibition of the club called the "Union Artistique" was opened in Rue Boisty d'Anglas on the 3rd instant. It will remain open till March 6.——M. Sentu has been elected President of the Union Architecturale of Lyons for this year; and M. Platet, President of the Société des Architects of Havre.——A subscription committee has been formed for the erection at Paris, on the Place d'Italie, of a memorial statue to Garibaldi.——The next exhibition of the Artistes Independants will be held in April, in the Horticultural Hall on the Cours-la-Reine.——The death is announced, at the age of sixty-three, of M. Besnard, architect to the Department des Monuments Historiques and Diocesan Inspecteur at Soissons (Aisne). He was a pupil of Questel, and was architect of numerous buildings at Soissons, notably the College.——The death is announced, at Autun, of M. Bulliot, a distinguished archæologist, and corresponding member of the Académie des Inscriptions et Belles Lettres. He carried on some important excavations at Beuvray, and published two valuable and learned books—"La Cité Gauloise" and "La Mission de Saint Martin dans le Centre de la France."

UNITED STATES.—The building statistics of New York show a remarkable decline in the building of single houses within the last decade. In 1890, plans were sanctioned for the erection of 835 small houses; for 1901 the total is just over 100. The average inhabitant of the city evidently prefers to live in a flat.——A Bill has been placed before the United States Congress to secure the appointment of a commission to report on a suitable site, and to obtain plans and models for a memorial arch to be erected in the district of Columbia in honour of the late President McKinley. The Bill provides that the commission may pay to competing artists a sum not exceeding 25,000 dols. for plans, specifications, and models——Mr. H. R. Marshall, President of the New York Chapter of the American Institute of Architects, and Mr. J De Witt Warner, President of the Municipal Art Society, have been appointed members of the New York Municipal Art Commission.

INDIA.—It is proposed to construct a light railway from Nagpur to Pandhurna in the Chindwara district.——The work of erecting a Calcutta memorial to the late Maharaja of Mysore has been commenced.——The North-Western Railway Co. of India is erecting large additional buildings at Rohtak in the Punjaub——The Bombay Improvement Trust proposes to erect offices for the accommodation of its officials at a cost not exceeding 2½ lakhs of rupees. The architect submitting the selected design will be commissioned to draw up detailed plans at a remuneration of 4½ per cent. on the cost of the building——Experts who have been examining the question of the water supply of Calcutta have come to the conclusion that there is plenty of water from the present sources to serve the whole city, but that there is great waste in many cases on the ground floors of large buildings.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The Electric Lighting Boards Company write that their counting-house has been removed to their registered offices at 7 Pall Mall, and the premises at 7, Grosvenor Mansions have been devoted entirely to sales.

CLEANING STREET ELECTRIC LIGHTS.—The Borough Council of Battersea has just purchased a novel apparatus to facilitate the cleaning and keeping clean of the electric lights of their district. This is practically a light telescopic fire escape with special fittings for resting against the lamp standards, and a rising platform at the top on which the workman can safely stand with both hands free while putting in carbons, cleaning globes, &c. The machine has been designed and constructed by Messrs. Merryweather, the fire-engine makers, who have also recently built nine similar apparatus for the Westminster Electric Supply Corporation.

THE SANITARY INSPECTORS' EXAMINATION BOARD.—The following candidates have passed in the examination for sanitary inspectors under the Public Health (London) Act, 1891, held in January. Miss F. A. Baker, Mr. G. W. Adkins, Miss M. E. Bibby, Miss H. M. E. Blackwell, Mr. S. T. Bocock, Miss J. J. Brown, Miss M. R. Burrows, Miss A. I. Cocksedge, Miss F. B. M. Ellis, Miss H. F. Ensor, Miss L. L. Ferard, Miss M. F. Hardcastle, Mr. P. A. Heath, Mr. S. R. Henderson, Miss O. C. M. Iles, Miss A. L. Jeffrey, Mr. W. C. Kelland, Miss G. Leaney, Miss F. N. F. Lovibond, Mr. G. Peverett, Mr. W. Rowsell, Mr. W. J. Smith, Miss X. C. Turner, Miss I. D. Tyas.

THE ISOLATION OF THE NATIONAL GALLERY.—In the House of Commons on Monday, Lord Balcarres asked the First Commissioner of Works whether he could state what progress had been made in the acquisition of properties needed for the isolation of the National Gallery, as specified in the Act passed during last Session. Mr. Akers-Douglas: Arrangements have been in negotiation for the acquisition of all these properties, and provision for the purchases is made in the Estimates for 1902-3. As soon as possible after April 1 next the purchases will be completed. I hope that possession will be obtained and the premises demolished this summer.

STEEL IN BUILDING CONSTRUCTION.—Professor Goodman, of the Yorkshire College, addressing the Leeds Association of Engineers on "Structural Ironwork," on the 2nd inst., said that for some buildings stone, brick, &c., answered admirably, but in their use for very high buildings serious difficulties arose. Mild steel was roughly seventy times as strong as stone in tension, seven times in compression, and ten times as rigid, whilst lending itself readily to structural purposes. Some years ago there was a prejudice against the use of steel made by the Basic-Bessemer process, but now structural steel is turned out by this process practically equal in every respect to that made by the acid open-hearth process. The Professor gave examples of steel skeleton buildings. A column should be centrally loaded. For a hollow circular column 30 ft. long, 12 in. in external diameter, and 1 in. thick, the safe load applied at the axis was 116 tons, but 1 in. from the axis only 31 tons. Experience had shown that a properly constructed steel frame would withstand fire better than brickwork or masonry, because distortion through expansion was of little consequence.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointments of Messrs. H. Thomas, H. J. Toogood, J. Bartlett, and G. L. Scott, as sanitary inspectors in the Metropolitan Borough of Bermondsey.

WESTMINSTER ABBEY AND THE CORONATION.—In the House of Commons on Monday Lord Balcarres asked the First Commissioner of Works whether he could say what special steps he had taken to preserve the fabric of Westminster Abbey from damage likely to be caused by the erection of scaffolding for the Coronation ceremony. Mr. Akers-Douglas: Westminster Abbey will, I presume, be handed over to my department according to precedent, with a view to preparing the edifice for the Coronation. Every care will be taken by the officers of my department to preserve the fabric from injury; and my officers have had recently, and I have every reason to hope will retain, the friendly co-operation and assistance of the authorities of the Abbey in this connexion.

PLUMBERS' REGISTRATION BILL.—Lord Glenesk has again introduced in the House of Peers a Bill for the Registration of Plumbers. It was read a first time on the 3rd inst., and the second reading (to which no notice of opposition has been given) stands for Monday next. Clause 1 of the Bill provides that a Plumbers' Registration Council shall be established and a Register of Plumbers kept and controlled by that Council. Clause 2 provides that after the date on which the Plumbers' Register comes into force a person shall not, unless he is registered in that Register, "state or imply, by taking or using any name, title, designation, addition, or description by means of initials or letters placed after his name, or by any other means, that he is a registered plumber." Clause 3, which is the only other operative clause, sets forth that a scheme for carrying the Act into effect is to be made by the Local Government Boards of England, Scotland, and Ireland. In the scheme provision is to be made for (1) the constitution, incorporation, and proceedings of the Council; (2) for the keeping and control of the Register and for enabling the Council to determine and regulate the qualification for registration; (3) for the disqualification of persons registered by misconduct, and the removal of the name of persons so disqualified from the register; (4) for fixing the date on which the register is to come into force, and for determining the conditions under which any person comes who is a plumber at that date; and (5) for the expenses of the Council and the fees to be paid in connexion with the registration. In framing the scheme regard is to be had to the representation on the Council of the following interests: (*a*) master and operative plumber; (*b*) local authorities aiding education in plumbing; and (*c*) teaching institutions and organisations specially interested in the education, examination, or registration of plumbers. Any scheme made under the Act must be laid before Parliament, and is liable to be annulled in whole or in part if either House votes an address to that effect within forty days. Lord Glenesk, in a memorandum he has caused to be circulated, explains that "the object of this Bill is to establish a system under which plumbers can, if they please, be registered. No privilege is given to registered plumbers, but a plumber is prohibited from calling himself a registered plumber, or representing himself to be a registered plumber, unless he is registered under the Bill. It will be necessary for a plumber to be qualified under the scheme approved by the Local Government Board before he is registered, and by this means persons employing plumbers will be enabled, if they desire to do so, to employ plumbers who have given evidence of their qualification for plumbers' work. The control of the registration system and the selection of qualifying examinations will be in the hands of a general council, consti-

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tuted under a scheme to be framed by the Local Government Board, and consisting of members representing master and operative plumbers, local authorities, and various sanitary associations. The main object of the Bill is similar to that of the Bills read a second time in 1892 and 1897, and reported on by a Select Committee and the Standing Committee on Trade in the House of Commons in those years respectively."

PRIZE FOR INDUSTRIAL HYGIENE.—The Council of the Society of Arts are prepared to award, under the terms of the Benjamin Shaw Trust, a gold medal, or a prize of 20*l.*, which under the conditions laid down by the testator, is to be given "For any discovery, invention, or newly-devised method for obviating or materially diminishing any risk to life, limb, or health, incidental to any industrial occupation, and not previously capable of being so obviated or diminished by any known and practically available means" Intending competitors should send in descriptions of their inventions not later than May 1, 1902, to the Secretary of the Society of Arts, Adelphi, London, W.C. The descriptions may be sent in under the inventor's name, or under a motto, accompanied by a sealed envelope enclosing the name as preferred.

BRITISH FIRE PREVENTION COMMITTEE.—The Imperial Federation of Fire Brigades in Austria (Oesterreichischer Feuerwehr Reichsverband) have nominated Mr. Edwin O. Sachs, the Committee's Chairman, to be an Honorary Corresponding Member, and the Royal Italian Fire Brigades Association have also asked Mr. Sachs to accept a similar distinction. The Belgian Fire Federation, too, recently elected Mr. Sachs to be an Honorary Corresponding Member.

LIVERPOOL'S ELECTRIC SUPPLY.—The city Electrical Engineer (Mr. A. B. Holmes), in submitting estimates for 1902 to the Electric Power and Lighting Committee of the Corporation, reports that the output of electrical energy during the past year has been more than 20 million units, and has, he believed, exceeded that of any other electrical undertaking in the United Kingdom. There has been a rapid growth of the supply, from less than 3 million to over 20 million units, during the past four years, and the number of tramcars now in the service is more than 380, as against 250 at the commencement of the year. In considering the most advantageous system to adopt for the outlying districts, the Electrical Engineer has given special attention to recent developments in the generation and distribution of electrical energy. He is of opinion that the time may be approaching when fuel will cease to be brought into such cities as Liverpool in the present form. It seems possible that before very long the energy contained in the fuel will be brought from the colliery to the city either in the form of a cheap gas or in the form of electricity at high pressure.

EATON CHAPEL, BELGRAVIA.—The materials of this proprietary chapel, together with the lecture-hall, in Eaton-terrace, have been sold, and the site will be used for improvements upon the Grosvenor estate. The effects comprised the fine queen-post roof with six principals, and a small belfry, 78 ft. long, a span of 55 ft., and a rise of 12 ft. 6 in.; a large amount of panelled woodwork, and an organ by Gray & Davison.

NATIONAL FEDERATION OF BUILDING TRADE EMPLOYERS.—At the annual meeting of the National Federation of Building Trade Employers, held in London on the 29th ult., and briefly referred to in our last issue, Mr. B. I. Greenwood (London) was elected President of the Federation for the ensuing year.

NOTTINGHAM MASTER BUILDERS' ASSOCIATION.—On the 31st ult., at Nottingham Victoria Station Hotel, the annual dinner of the Nottingham Master Builders' Association was held. The chair was occupied by the President, Mr. H. Vickers, and the vice-chair by the Vice-President, Mr. F. H. Fish, and there were present, among others, the Mayor of Nottingham (Councillor E. N. Elborne, J.P.), the Sheriff (Councillor E. G. Loverseed), Mr. A. W. Brewill (vice-president), and Mr. H. G. Watkins (hon. secretary), of the Nottingham Architectural Society, Messrs. A. E. Tallis (secretary of the Midland Federation), W. Edgar (ex-president of the Nottingham Association), J. W. Woodsend (hon. treasurer), and James Wright (hon. secretary). The loyal toasts were submitted from the chair. Mr. Jas. Wright proposed "The Mayor, Magistrates, and Corporation," and in the course of his remarks he said that they, as an Association, felt that a great deal of the work undertaken by corporate bodies could be very much better done on contract.—The Mayor, in reply, said that it was the aim of the Corporation to make the city as popular and as successful as they could, and they desired to give all trades every facility to carry on their business without introducing too many stringent regulations. Speaking individually, he thought that the Corporation ought not to undertake any work that they were not absolutely bound to do. It was only fair that they should give the trades of the town every facility to work according to the ordinary laws of supply and demand. He certainly thought that building work would be better done by individuals than by corporate bodies. The question was as to whether the corporate bodies received as good a return for the money they spent as did individual firms. If they did not they were doing an injustice to the ratepayers, and a gross injustice to the people associated with the particular business in hand. Touching upon the question of the regulation of buildings, he thought that it was clear that the Corporation ought to have more power than they possessed at present.—The Sheriff also replied. Councillor J. Wright submitted the toast of "The Architects." He wished that the architects had more confidence in the builders, and he could assure them that the desire of the builders was to work amicably with them.—Mr. A. W. Brewill, in response, agreed with the proposer that the whole difficulty between the builders and the architects was the regrettable one of £. s. d. He was often sorry that they could not go back to the old times when the architect was the master builder. If they had large buildings to erect nowadays they had to rush them, and under such circumstances it took a great deal of pleasure from the work. He sincerely wished that they had some system whereby all contracts were remunerative, the contractors receiving a fair price without running the risk of losing money through strikes and other unforeseen circumstances.—Mr. John Lewin, C.C., introducing the toast of "Success to the National Federation, and the Nottingham Master Builders' Association," said that organisations of master builders were of comparatively recent growth, and they had been brought into existence by the organisations which existed on the part of the men. The last statistics with regard to trades unionism in the building trade showed that they contained 190,000 members, with an income of 347,000*l.*, and an annual expenditure of 293,000*l.* They had funds of 412,000*l.*, and in one year they spent a sum of 57,000*l.*, in strikes, and one of 72,000*l.* in management expenses. That meant that 129,000*l.*, had been spent to fight the employers. He did not want to imply that the object of trade unionism was altogether to fight employers. Undoubtedly trade unionism had a useful part to play, and had played a useful part in bettering the condition of the workers, but there was only too good reason to believe that in recent years it had abused its high privileges. The very existence of master builders had in recent years been jeopardised. They had nothing to fear from demands for high wages, for that was a matter which would work out according to the laws of supply and demand, but seeing that their industry was the second largest in the country, it ought not to be unduly hampered and restricted as it had been. His charge against trades unionism was that the restrictions they had sought to enforce had tended to seriously cripple the trade. The restriction of the output was a fatal policy alike to workmen, employers, and the community at large, and he was afraid that the unions had unduly and unnecessarily interfered with liberty of management. He was beginning to feel also that even the cherished doctrine of the standard rate of wages did not work out as it was intended that it should. Unless the builders were prepared to stand together their troubles were on the increase. Mr. J. N. Greenall and Mr. F. H. Fish responded briefly. The remaining toasts were "The Visitors," submitted by Mr. Enoch Hind, and acknowledged by Mr. J. Sulley, and "The Chairman," proposed by Mr. W. Edgar.

WATER SUPPLY, CRIEFF, PERTHSHIRE.—In connexion with the scheme for the augmentation of the Crieff water supply, costing 12,000*l.*, the engineer of which is Mr. Robert Gilmour, C.E., Glasgow, another section has now been estimated for—namely, the reservoirs. They are to hold 1,000,000 gallons, equal to fully a two-days' supply for the average population of the town. At a recent meeting of the Water Committee of the Town Council it was agreed to recommend to the Council to accept the offer of Mr. John Pollock, contractor, Glasgow, to erect the new reservoir at a cost of 3,105*l.*

REREDOS, ST. JAMES' CHURCH, GRAVESEND.—A new reredos has just been dedicated in this church and the whole of the chancel decorated in gold and colour. The reredos is of carved oak, with two bas-relief panels representing the "Gathering of Manna" and the "Lord's Supper." The whole was carried out by Messrs. Taylor & Clifton, of London.

CAPITAL AND LABOUR.

MAIDSTONE LABOUR DISPUTE.—The suspension of work of some of the men engaged in the building trade in Maidstone continues. The latest proposals of the masters, that time and a quarter for overtime should commence after a ten-hour day, and that the hour for commencing work during December and January should be eight o'clock, were submitted to a special meeting of the committee of the men's allied trades; and, after a long debate, rejected. Mr. Oram, the secretary of the allied trades, has since sent the following letter to Mr. Crow, the secretary of the Master Builders Society:—"Sir,—Your letter of the 25th inst. to hand, and duly laid before a meeting of the delegates of each of the following branches of the building trade: — Bricklayers, carpenters and joiners, painters, masons, and labourers, and, after considerable discussion, it was resolved, 'That we are unable to accept latest offer of the employers.' We regret your Association is unable to alter Rule 2 so as to conform to the wishes of the workmen. We are also unable to agree to accept Rule 3 as submitted, but we are prepared to arbitrate upon the disputed points, providing the usual course be adopted of resuming work pending an award. We shall be glad to learn as to how your Association will be willing to meet our representatives, whether sectionally or conjointly, and the number of each you will be willing to see.

LEGAL.

THE LIABILITY OF CONTRACTORS.

THE hearing of the case of Maxwell *v.* the British Thomson Houston Co.—Blackwell & Co. third parties, was concluded in the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Mathew, on Friday last week, on the appeal of the defendants from the judgment of Mr. Justice Kennedy after trial of the action, with a special jury, at Leeds. The action was brought by the plaintiff, Miss Maxwell, against the defendants, the British Thomson Houston Co., Ltd., to recover damages for personal injuries caused by the alleged negligence of the defendants' servants. The defendants denied liability, and contended that if they were liable, they had a right of indemnity over against Blackwell & Co., and accordingly brought them in as third parties to the action. The question as to the liability of the defendants was alone tried at Leeds, their right of indemnity against the third parties standing over.

It appeared that the Corporation of Leeds owned certain horse tramways and obtained statutory powers to work the tramways by electrical power, and for that purpose entered into a contract with defendants, who undertook to convert the tramway system and equip it with electrical overhead wires. The defendants entered into a sub-contract with Blackwell & Co., by which the latter were to erect the iron standards, with arms, along the streets to carry the overhead wires, and the fixing of the wires. To do this work, Blackwell & Co. used a tall derrick or trolley on wheels, with a platform on the top which projected beyond the side of the derrick to enable the workmen to reach the arms of the standards, and so fix the wires. Round the edge of the platform were iron rails to protect the workmen while at work on the platform. The plaintiff, who was riding on a car in the daytime, was struck on the head by these iron rails as the car was passing the derrick, and was seriously injured, the accident being caused by some of the workmen in Blackwell & Co.'s employment leaving the derrick too near the tram lines after they had finished work, and leaving the iron rails projecting from it. The jury found that the persons in charge of the derrick were responsible for the accident by reason of negligence in not taking reasonable care to remove the derrick far enough away from the tram lines. The amount of the damages was agreed upon. Mr. Justice Kennedy held that the defendants were liable, and gave judgment for the plaintiff. Hence the present appeal of the defendants, who contended that they were not liable for the negligence of the sub-contractors. They also contended that the Corporation of Leeds were liable, and that they, being merely intermediaries, were not liable.

At the conclusion of the argument of counsel their lordships held that the defendants by delegating the portion of the work in question to Blackwell & Co., did not relieve themselves from the duty of taking special precautions for the safety of the public, and that they could not escape liability by delegating the work to a sub-contractor. They therefore affirmed the decision of Mr. Justice Kennedy and dismissed the appeal with costs.

Mr. Macaskie, K.C., and Mr. Horace Marshall appeared for the appellants (defendants), and Mr. Tindal Atkinson, K.C., and Mr. Longstaffe for the respondent (plaintiff).

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

17,719.—FITTINGS FOR CLOSET-SEATS: *A. D. Foulkes.*—The seat is pivoted either in brackets that are bolted on to the basin-rim, or with counter-weighted arms on to two standards separated from the basin. The standards and arms are shapened alike for their use on the right side or the left side of the seat which can be vertically adjusted by means of pivot-holes in each of the standards.

17,725.—A CONTRIVANCE FOR WINDOW-SASHES: *T. Boardall.*—The inventor contrives that a sliding tanlight or upper sash shall slide in a casement-frame outside the leaves of the casement, and he adapts for the frame the weather-bars specified in No. 11,066 of 1899, a weathertight joint being supplied by rebating the sash or casement meeting-rail that it may fit over the parting-beads.

17,726.—A TRAP FOR GULLEYS: *H. Brooks & Co. and F. Sykes.*—A dip-plate serves as a trap for the outlet, and is fashioned either separately from or in one piece with the body of the trap.

17,728.—A SPANNER: *T. B Brooks and T. Holt.*—An arrangement of teeth locks the sliding jaw of the stem, being retained in their engagement by a wedge which is inserted between the back of the

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jaw and the stem, and is held in its place with a spring, or with an eccentric or screw; the wedge is forced back into the wider part when one wants to liberate the sliding jaw.

17,743.—FLUSHING APPARATUS: *D. Grundy, D. R. Grundy, and R. C. Grundy.*—The apparatus, which will serve for delivering fixed quantities of water, is described as being primarily devised for use with water-closets after the kind specified in Nos. 20,432 of 1899 and 14,446 of 1900. A supply-pipe communicates with a casing having a plug cock, which is linked to the seat of the closet, and is provided with two branch supply ports and two waste ports; the valve casing is also connected by side pipes to containers fitted with float valves, the plug cock being so turned that the water shall flow up one pipe to one container and at the same time exhaust from the other container to the waste-pipe. In another form the valve is modified, and only one container is employed. A non-return valve is fitted on the supply-pipe.

17,758.—MANUFACTURE OF WOODEN FLOORING: *F. Wehinger.*—For mosaic sheets or plaques for floors and so on the inventor joins grooved wooden blocks together with warp and weft wires by means of a machine in which an endless band and a set of shoots set parallel to one another feed the blocks on to a slotted table, when blocks upon a cross-bar sliding in slotted guides and worked with levers and cams press them between the converging warp-wires; the warp-wires are attached to a warp roller or bar and to a transverse abutment-bar; for the interweaving with the weft-bars they are lifted and lowered with cams upon a shaft driven with an endless band from the main shaft; the blocks are then forced beneath weighted rollers, the last row being retained in position with a cross-bar which is secured to pivoted oscillating bars.

17,826.—APPLIANCE FOR WINDOW-SASHES: *T. E. Tubbs.*—The sashes can be turned inwards by means of metallic bars which, being slotted cross-wise, will slide upon screws passing through the slots into the sash-stiles. The sashes are hung with cords, and the bars can be drawn out of the frames by lifting them with their lugs or knobs.

17,866-7.—CONSTRUCTION OF FLOORS, RETAINING-WALLS, PARTITIONS, &c.: *C. Eliet.*—For strengthening purposes in the case of beton or concrete floors, girders, silos, quays, and similar structures, are employed metallic bars, either curved or straight, or in combination, which are joined to one another or braced with hooked rods or bars split at their ends; the curved rods are so arranged that they shall cross one another where the bending point is a minimum or vanishes, and shall be farther asunder where the bending point is a maximum. The curved bars may be fashioned in one piece and have overlapping ends, or may be joined to the straight bars with hooks and eyes, or with pins inserted through eyes. (17,867) In another form the metallic bars are caused to project beyond the edges of beton or concrete slabs adapted for structural purposes, and are joined together by means of hooks and eyes, or loops, pins, sockets, nuts, cores, and so on, or by the embedding of their ends in concrete or cement after the laying of the slabs. The inner bars will resist shearing and bending stresses at different points of the slabs, whilst the joints between the latter are disposed at the places where the bending moment is a minimum or zero. For connecting a flooring slab to a girder with concrete there are S-hooks that project from the slab or girder into the concrete, and spacing-ribs that project from the slab or girder.

17,890.—BASINS FOR LAVATORIES: *A. Sherwin.*—An open top is fashioned upon the overflow pipe, and is to be closed by means of a sliding pivoted cover, upon the under side of which is a projection for locking purposes. On the pivot is a spiral spring that holds down the cover.

17,892.—CONSTRUCTION OF BAKERS' OVENS: *W. Richardson.*—The oven, being after the sheet-iron or internally heated brick kind, has a rectangular fire-brick furnace set below the level of the oven hearth, its walls being solid, and its inclined bottom essentially so. The inlets for supply of air have dampers, and are placed in communication with curling super-heating tubes in the brickwork, which have, at their ends, vertical tubes that pass to the furnace hearth.

17,940.—ATTACHMENTS OF FILES AND RASPS: *H. Focke.*—A pin and the ends of a piece which slides in a slot cut in the shank of the handle, and, being screw-threaded, engages with a socket secured with a pin to the handle, serve for fastening the blade, which is rendered the more secure by the act of screwing the handle.

17,966.—PREPARATION OF GLUE: *L. L. Kelsey.*—The glue is made into long roughened strips that will dry quickly and uniformly, and can be easily redissolved, by pumping it, when liquescent, through a pipe into another pipe having branches into a series of chambers within which it is cooled, and becomes partially set, as in a cold-water jacket; the semi-solid glue will be expelled in the shape of pencils or strips out of openings in the sides of the chambers, which are also flared outwards.

17,994.—APPARATUS FOR USE WITH DREDGER LIGHTERS: *R. W. Goldsbrough.*—For enabling water to be drained away from the cargo of wet sand, a box, having its top and sides pierced, is affixed to one of the bulkheads of the lighter, and is placed in communication with similar boxes around the hold of the vessel; similar boxes are also disposed around the combing, all of them being filled with some filtering material, which collects the water and conveys most of it to the bilge.

17,995.—APPLIANCES FOR BUILDERS' CRADLES OR STAGES: *J. Coppard.*—For hanging a swinging stage or cradle, as used by builders, decorators, and others, the inventor loops wire ropes over poles or cantilevers and winds them upon drums. In one adaptation of the winding apparatus he uses a shaft that is turned with a central worm and wheel, and has a winding-drum at each of its ends: in another, he fits a worm, a worm-wheel, and a winding-drum at each end of the stage; and in another, he winds the ropes around a middle drum and passes them over pulleys in the corners of the stage, and thence through rings at the sides.

18,006.—CONDUITS FOR ELECTRICAL CONDUCTORS: *H. Tugby.*—The sections of the conduit are fastened together with rectilinear spigot-and-socket joints; they are fashioned with a rectilinear cross-section, and with channels that are divided with webs lengthwise, and are closed with sectional covers of which the edges, and it may be, the ends too, are rebated; orifices in the channels enable moisture to flow into auxiliary conductors, laid upon bridge-pieces in the channels and properly insulated.

18,019.—A HANGING STAGE FOR USE ON THE OUTSIDE OF HOUSES: *T. Schumacher.*—The staging consists of two end frames that can be secured at any required distance apart by means of hinged bars and a rod, a footboard is laid upon the lower bars and a hook and a safety-pin keep it in its position; a hook from one frame will engage with an eye in the side of the window, whilst a loop on the other frame engages with an eye in the next window to which the frame is fastened with a safety-pin; the two frames and the bars can be folded together after the footboard has been taken out.

18,028.—A HOT-BLAST FURNACE: *E. T. Bradford,*—The blast-heating pipes are laid upon bars in the upper part of the furnace, which is built of, or lined with, some such refractory material as fire-brick, and they should consist of short cast-iron elbows and sections; a blower impels the blast beyond a valve and through a pipe into the upper portion of the heating apparatus, whence it flows into the air-belt that supplies the tuyères; a branch pipe, fitted with a valve, will admit a cold blast directly into the air-belt.

18,038.—IMPROVEMENTS FOR SPANNERS, CALLIPERS, &C.: *T. A. Weston.*—Instead of the two pairs of jaws, adjustable with spur-wheels and right and left handed screws, as specified in No. 9,784 of 1898, is substituted one pair only, having a handle fitted with wrenching-heads. The improvement is rendered available also for callipers by means of an arrangement of jaws, spur-wheels, and screws. For an adjustable spanner in which a pawl upon the adjustable jaw turns the nut, the stem of the jaw engages with a slot cut in the main stem, a quick adjustment being ensured by means of the external and internal threads of the nut, which are right and left handed respectively. The split nut is clamped in its place by forcing inwards a sliding taper-pin.

18,045.—TERMINAL BOXES FOR COMPOUND CABLES: *G. E. Heyl-Dia and W. Hilch.*—To a sleeve is affixed a disc-plate to be soldered to the cable sheathing. The wires of the cable, of which the end is stepped, are laid in the radial grooves of vulcanite discs, and the decreasing sizes of the discs provide for the connexions of the wires. On to one of the discs is screwed a metallic cover, that may consist of two portions clamped together, and there is a middle milled screw for purposes of inspection, &c.

18,071.—APPLIANCES FOR FANLIGHTS: *G. F. Newman.*—On a swivelling bracket of the fanlight is a pulley-nut, around which is passed an endless cord, the nut working upon a screw pivoted on to a bracket in the fixed frame. A pivot of the swivelling bracket will turn in a bearing of a bolt that can be adjusted in a bracket of the fanlight, and can be caused to slide, being clamped. The bolt may have an angle-section, or its turning can be prevented with a set-screw pressing against its flattened side.

18,087.—SIPHONICAL DISCHARGE: *E. T. Jeffery.*—The siphon and the stand-pipe are arranged to communicate with the inside of a closed box, so as to constitute a trap in the longer leg of the siphon. A pipe connects the crown of the siphon to a push, which, when worked, will enable the air to escape, and thereby start the flush. The flush will be arrested by a flow of air through a dip-pipe.

MEETINGS.

FRIDAY, FEBRUARY 7.

Architectural Association Discussion Section.—Mr. J. Dudley Forsyth on "Stained Glass." 7.30 p.m.

Institution of Junior Engineers (Westminster Palace Hotel).—Paper on "The Electric Passenger Elevator," by Mr. William J. Cooper. 8 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. E. J. Steegmann on "The Atmosphere; Pressure and Composition: Air; Combustion and Respiration." 7 p.m.

Birmingham Architectural Association.—Mr. E. P. Hinde on "Elementary School Planning."

Glasgow Architectural Craftsmen's Society.—(1) Mr. J. S. Robertson on "Stone"; (2) Mr. R. Armour, jun., on "Brick." 8 p.m.

SATURDAY, FEBRUARY 8.

Dundee Institute of Architecture.—Mr. Menart on "A Comparison of Continental and British Architecture." 7 p.m.

MONDAY, FEBRUARY 10.

Surveyors' Institution.—A discussion on the papers read by Mr. Dudley Clarke and Mr. G. S. Mathews, entitled, "The Final Report of the Local Taxation Commission." 8 p.m.

Society of Arts (*Cantor Lectures*).—Mr. Cyril Davenport, F.S.A., on "Personal Jewellery from Prehistoric Times"—I. 8 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. E. J. Steegmann on "Meteorology." 7 p.m.

Bristol Society of Architects.—Mr. A. H. Dykes, A.M.Inst.C.E., on "Electricity as Applied to Buildings." 8 p.m.

TUESDAY, FEBRUARY 11.

Institution of Civil Engineers.—Mr. G. Cunningham Buchanan on "The Port of Dundee." 8 p.m.

WEDNESDAY, FEBRUARY 12.

Society of Arts.—Mr. W. Leonard Magden on "Industrial Redistribution and its Connexion with the Overcrowding Question." 8 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. J. Priestley on "Sanitary Law"—I. 7. p.m.

Leeds and Yorkshire Architectural Society.—Dinner, Queen's Hotel.

Institution of Electrical Engineers (*Birmingham local Section*).—(1) Discussion on Dr. W. E. Sumpner's papers on "Alternate Current Diagrams" and "The Testing of Motor Losses." (2) Professor R. Threlfall, F.R.S., will then give some Electric Furnace Demonstrations. 7.30 p.m.

Institute of Sanitary Engineers.—Mr. W. E. Markham on "The Application of Disconnexion." 7 p.m.

THURSDAY, FEBRUARY 13.

Institution of Electrical Engineers.—(1) "Researches on the Electrical Conductivity and Magnetic Properties of upwards of a hundred different Alloys of Iron," by Professor W. F. Barrett, F.R.S., and Mr. W. Brown, B.Sc.; (2) "On some Conclusions Deduced from the Preceding Paper," by Professor W. F. Barrett. 8 p.m.

Manchester Society of Architects.—Mr. C. M. Hadfield on "English Architecture of the Fifteenth Century," illustrated by lantern views.

FRIDAY, FEBRUARY 14.

Architectural Association.—Miss Ethel M. Charles, A.R.I.B.A., on "A Plea for Women Practising Architecture." 7.30 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. J. Priestley on "Sanitary Law."—II. 7 p.m.

Sheffield Society of Architects and Surveyors.—Mr. C. Hadfield on "True Building."

Institution of Civil Engineers.—(Students' meeting). Mr. C. Johnston on "Some Public Health Aspects of the Question of Sewage Disposal." 8 p.m.

SATURDAY, FEBRUARY 15.

Architectural Association.—Second Spring Visit, to the Victoria and Albert Museum and Royal College of Science, Kensington, by permission of the architect, Mr. Aston Webb, A.R.A. 2.30 p.m.

Royal Institution.—Rt. Hon. Lord Rayleigh on "Some Electrical Developments"—I. 3 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 21.—By J. C. PLATT (at Hammersmith).

Hammersmith.—52, Illey-rd., u.t. 64 yrs., g.r. 6*l.*, e.r. 38*l.*	£325
34, Mall-rd., u.t. 63 yrs., g.r. 7*l.*, r. 40*l.*	400
13, 14, and 15, George-st., u.t. 13 yrs., g.r. 4*l.* 15s.	185
Kensington.—12, Colet-gdns., u.t. 89 yrs., g.r. 8*l.*, e.r. 50*l.*	580

January 25.—By T. LAVINGTON (at Marlborough).

Marlborough, Wilts.—High-st., The Royal Oak Inn, f.	3,050
28, 29, and 30, The Parade, f., r. 61*l.* 12s.	840
Herd-st., three freehold building sites	501
21, St. Martin's, f.	165

January 27.—By ELLIOTT, SON, & BOYTON.

Piccadilly.—No. 86, beneficial lease for 18 yrs., r. 600*l.*	2,020

By FRED. VARLEY.

Stratford.—66 to 88 (even), Paul-st.; also l.g.r. 3*l.* 15s. 6d., u.t. 23 yrs., g.r. 40*l.*	1,120
Finsbury Park.—11, Beaulieu-villas, u.t. 54 yrs., g.r. 15*l.*, e.r. 75*l.*	600
Old Ford.—125 and 127, St. Stephen's-rd., f.	500

Jan. 28.—By JOHN BOTT & SONS.

Penge.—11 and 13, Croydon-rd., u.t. 60 yrs., g.r. 8*l.*, r. 82*l.*	480

By C. W. DAVIES & SON.

New Southgate.—Limes-av., St. Heliers, f., e.r. 60*l.*	850
Tottenham.—21, 23, 25, 31, 33, 35, and 45, Carlingford-rd., u.t. 88 yrs., g.r. 38*l.*, r. 224*l.*	2,100

By MAPLE & CO.

Marylebone.—14, Little Goodge-st., f., e.r. 60*l.*	850

By RUTLEY, SON, & VINE.

Highgate.—High-st., Ivy House and Northgate House, f., r. 120*l.*	2,510
Hampstead-rd.—57, William-st., u.t. 193 yrs., g.r. 8*l.*, r. 40*l.*	377
187, Stanhope-st., u.t. 37 yrs., g.r. 5*l.*, r. 50*l.*	610

By F. WARMAN.

Brompton.—41, Gunter-grove., u.t. 52 yrs., g.r. 5*l.*, e.r. 50*l.*	460
Highbury.—18, Northolme-rd., u.t. 87 yrs., g.r. 7*l.*	650
98, Highbury New Pk., u.t. 48 yrs., g.r. 20*l.*, e.r. 130*l.*	800
40, Aberdeen Pk., u.t. 98 yrs., g.r. 5*l.*	1,460

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January 29.—By FURBER, PRICE, & FURBER.

Bayswater.—23, Hereford-rd., u.t. 18½ yrs., g.r. 7*l.*, r. 60*l.*	£320
Edgware-road.—Nos. 24 and 26, u.t. 50 yrs., g.r. 82*l.*, r. 340*l.*	4,000

By FRITH, GARLAND, & CO.

Harringay.—127, Effingham-rd., u.t. 88½ yrs., g.r. 5*l.*, r. 30*l.*	295
Hornsey.—Hampden-rd., a plot of building land, f.	140

By J. & W. JOHNSON & CO.

Dalston.—32 and 34, Mayfield-rd., u.t. 19½ yrs., g.r. 10*l.*, r. 64*l.*	330
40, Mayfield-rd., u.t. 19½ yrs., g.r. 6*l.* 5*s.*, r. 34*l.*	160
221, Dalston-lane, u.t. 37 yrs., g.r. 4*l.* 16*s.*, r. 36*l.*	325
24, Marlborough-rd., u.t. 43 yrs., g.r. nil, r. 28*l.*	295
Stoke Newington.—27, Somerford-grove, u.t. 8¾ yrs., g.r. 4*l.* 10*s.*, r. 26*l.*	100
Mile End.—70 to 82 (even), Oxford-st., u.t. 5¾ yrs., g.r. 63*l.*	815
77, Oxford-st., u.t. 23 yrs., g.r. 3*l.*	220
76, 78, and 80, Bedford-st., and 7 to 17 (odd), Russell-st., u.t. 16 yrs., g.r. 60*l.*	1,100

By MAY & PHILPOT.

Streatham.—43, Lanercost-rd., u.t. 92 yrs., g.r. 9*l.*, e.r. 55*l.*	640

By MAY & ROWDEN.

Oxford-street.—No. 474, u.t. for 22½ yrs., g.r. 220*l.*, r. 625*l.*	5,050

By R. TIDEY & SON.

Islington.—36, Oakley-rd., u.t. 38 yrs., g.r. 5*l.* 10*s.*, r. 40*l.*	465
27, Almorah-rd., u.t. 50¾ yrs., g.r. 10*l.*, r. 44*l.*	430
51, Almorah-rd., u.t. 50¾ yrs., g.r. 10*l.*, r. 48*l.*	430

By WYATT & SONS (at Chichester).

Chichester, Sussex.—89, East-st., f., r. 80*l.*	1,200
11 and 12, Chapel-st., f.	150

By J. H. BRADWELL & SONS (at Nottingham).

Gunthorpe, Notts.—Four houses, three cottages and gardens, area 8 a. 2 r. 21 p., f.	3,890
An enclosure of land, 1 a. 3 r. 17 p., f.	205
The Hollies and 86 a. 0 r. 31 p., f.	4,312
Residence, farm and 63 a. 2 r. 6 p., f.	2,985
Eleven closes of land, 65 a. 2 r. 13 p., f.	4,468
Three cottages and 0 a. 1 r. 26 p., f.	505
Blacksmith's shop, house, and three cottages, area 0 a. 1 r. 16 p., f.	385

January 30.—By RANDALL, COX, & BAKER.

Whetstone.—2 and 3, The Parade, f., r. 55*l.*	880

By J. A. & W. THARP.

Forest Gate.—27, Sebert-rd., f.	430
Leytonstone.—21 and 23, Victoria-rd., f.	410
Manor Park.—127 and 129, Herbert-rd., f.	485

By WM. WESTON.

Paddington.—6, Westbourne-ter. North, u.t. 47¾ yrs., g.r. 7*l.* 10*s.*	400
Fulham.—29 and 31, Parkville-rd., u.t. 77¾ yrs., g.r. 11*l.*	600

By R. Imeson & Son (at Ripon).

Kirklington, Yorks.—Howgrave Hall Farm, 131 a. 0 r. 10 p., f. and c.	5,050
Upsland Farm, 74 a. 3 r. 9 p., f.	1,470

By T. W. MEPHAM (at Forest Gate).

Forest Gate.—98 and 100, Vansittart-rd., f.	410
123, 139, and 141, Station-rd., f.	930

January 31.—By DAVID BURNETT & CO.

Wimbledon.—Graham-rd., a freehold bakehouse, stabling, and yard	1,000
Highbury.—49, Kelvin-rd., u.t. 57¾ yrs., g.r. 10*l.* 10*s.*, r. 48*l.*	590
53 and 55, Kelvin-rd., u.t. 57¾ yrs., g.r. 4*l.*, r. 72*l.*	925

By MARK LIELL & SON.

Mile End.—5, St. Helen's-ter., u.t. 45 yrs., g.r. 6*l.*, e.r. 65*l.*	670
Bow.—46, Alfred-st., u.t. 45 yrs., g.r. 4*l.* 10*s.*, e.r. 38*l.*	430

By OGDEN, SONS, & OLLEY.

South Farnborough, Hants.—Alexandra-rd., a plot of building land, f.	200

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 11 6	per 1,000 alongside, in river.
Rough Stocks and Grizzles	1 9 6	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 5 0	,, ,, ,,
Flettons	1 8 0	,, at railway depôt.
Red Wire Cuts ..	1 12 0	,, ,, ,,
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,, ,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	per 1,000 at railway depot.
Do., Bullnose	4 10 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 5 6	,, ,, ,,
GLAZED BRICKS		
Best White and Ivory Glazed Stretchers	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers..	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamfered, Squints	20 0 0	,, ,, ,,

PRICES CURRENT (*Continued*).

BRICKS, &c.

	£ s. d.	
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	per 1,000 at railway depot.
Quoins, Bullnose, and Flats	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers..	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamfered, Squints	14 0 0	,, ,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,, less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	32 0	per ton, delivered.
Best Ground Blue Lias Lime..	25 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	11s. od. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.	

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6½	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 2	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks ..	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup)	2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,
,, ,, 5 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	1 15 0	per 1000 of 1200 at ry. dep.
,, best seconds ,,	11 5 0	,, ,,
16×8 best ,,	6 12 0	,, ,,
20×10 best blue Portmadoc ..	11 5 0	,, ,,
16×8 best blue Portmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green....	12 2 6	,, ,,
16×8 ,, ,,	7 5 0	,, ,,
20×10 permanent green	10 5 0	,, ,,
16×8 ,, ,,	5 17 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles..	41 6	per 1,000, at rly. depôt.
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	13 10 0	15 10 0
Deals: best 3 by 9	13 0 0	14 10 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in	10 0 0	11 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2 in. by 4½ in. and 2 in by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards—		
1 in. by 1¼ in. by 1¾ in.	0 10 0	more than battens.
¾ in.	1 0 0	,,

	At per load of 50 ft.		
Fir timber: Best middling Danzig or Memel (average specification)	4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Swedish balks	2 15 0	3 0 0	
Pitch-pine timber (30 ft.)	3 0 0	3 10 0	

JOINERS' WOOD.

	At per standard. £ s. d.	£ s. d.
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	15 0 0	16 0 0
Second yellow deals, 3 in. by 11 in.	17 0 0	18 0 0
,, ,, 3 in. by 9 in.	15 10 0	16 10 0
Battens, 2½ in. and 3 in. by 7 in.	12 0 0	13 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	12 10 0	13 10 0
Battens, 2½ in. and 3 in. by 7 in.	10 10 0	11 10 0

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Petersburg: first yellow deals, 3 in. by 11 in.	19 0 0	20 0 0
Do. 3 in. by 9 in.	16 0 0	17 0 0
Battens	12 10 0	13 0 0
Second yellow deals, 3 in. by 11 in.	14 0 0	15 0 0
Do. 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	11 10 0	12 10 0
Do. 3 in. by 9 in.	11 0 0	12 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	13 10 0	14 10 0
,, ,, ,, 3 in. by 9 in.	12 10 0	13 0 0
Battens	10 10 0	11 10 0
Second white deals 3 in. by 11 in.	12 10 0	13 10 0
,, ,, ,, 3 in. by 9 in.	12 0 0	12 10 0
,, ,, ,, battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes..	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6
Danzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 7
¾ in. do. do.	0 0 7	- - -
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—Per ft. cube	0 3 0	0 3 6

	Per square.	
Prepared Flooring—		
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, £ s. d.	Delivered Railway Vans, per ton. £ s. d.
Rolled Steel Joists, ordinary sections	6 5 0	7 5 0
Compound Girders ,, ,,	8 0 0	9 0 0
Angles, Tees and Channels, ordinary sections	8 2 6	9 2 6
Flitch Plates	8 10 0	0 0 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Sheet Iron, Galvanised, flat, best quality:—		
Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs & up.	14 0 0	- - -
Pipe in coils	14 10 0	- - -
Soil Pipe	17 0 0	- - -
ZINC—Sheet—		
Vieille Montagne ..... ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet ..... per lb.	0 1 0	- - -
Thin ,,	0 1 1½	- - -
Copper nails ..... ,,	0 1 1½	- - -
BRASS—		
Strong Sheet ..... ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ..... ,,	0 1 3	- - -
SOLDER—Plumbers' ..... ,,	0 0 6½	- - -
Tinmen's ..... ,,	0 0 8	- - -
Blowpipe ..... ,,	0 0 9	- - -

[See also page 149.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Laying-out Pleasure Ground	Aldershot U.D.C.	20*l.*, 10*l.* and 5*l.*	Mar. 1
*Infectious Disease Hospital	Borough of Dunstable	5*l.* 5s.	Mar. 14
Proposed Public Offices	Aldershot U.D.C.	100*l.*, 75*l.* and 50*l.*	Mar. 29
New Town Hall	Harrogate Corporation	150*l.*, 100*l.*, and 75*l.*	May 14

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Taking Down and Re-erecting Iron School	Ilford School Board	C. J. Dawson, 7, Bank-buildings, Ilford	Feb. 10
Tar Paving Playgrounds, Downshall School	do.	do.	do.
Additions to Rose and Crown-Inn, Holmfirth	Sunderland Corporation	J. Berry, Architect, 3, Market-place, Huddersfield	Feb. 11
Sewerage Works		Borough Engineer, Town Hall, Sunderland	do.
Additions to Schools, Bray, Ireland	Great Western Railway Company.	T. Tomlinson, 2, Queensborough-terrace, Bray	do.
House, Redland-grove, Carlton, Nottingham		G. W. Bird, Architect, Ripley, Derby	do.
Additions to Goods Shed, Plymouth (Mill Bay) Statn.		G. K. Mills, Paddington Station	do.
Sewerage Works, South Normanton	Lutterworth R.D.C.	H. Silcock, Engineer, 34B, Westgate, Mansfield	do.
Granite Road Metal, &c.		J. C. Coates, Surveyor, Lutterworth	do.
Five Houses, Cleethorpes	Messrs. R. S. & C. Osborne	E. E. Bentley, Architect, 1, Pelham Chambers, Grimsby	do.
Re-seating Parish Church, Wembworthy, N. Devon.		E. H. Harbottle & Son, Architects, County Chambers, Exeter	do.
Street Works, St. George's-street, &c.	Tyldesley (Lancs) U.D.C.	J. B. Smith, Civil Engineer, Council Offices, Tyldesley	do.
Road Materials, &c.	do.	do.	do.
Schools, Barton-on-Humber		J. Gibson, Architect, Stalybridge	do.
Alterations to Lodge and Laundry	Bradford Corporation	F. E. P. Edwards, Architect, Chapel-lane, Bradford	do.
Additions to Schools	Workington School Board	J. Howes, Architect, Curwen-street, Workington	do.
Bricks (3½ millions)	Swansea Town Council	J. Thomas, Guildhall, Swansea	do.
Road Metal	Durham R.D.C.	G. Gregson, Surveyor, 38, Saddler-street, Durham	do.
*Annual Contracts	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
*Guernsey Broken Granite	do.	do	do.
Surveyor's Materials	Birkenhead Corporation	C. Brownridge, Civil Engineer, Town Hall, Birkenhead	Feb. 12
Warehouse, Eccleshill, Bradford		Kendall & Bakes, Architects, Victoria-square, Leeds	do.
Additions to Farm Buildings, near Beccles	Hon. A. J. Mulholland	A. Pells, Architect, London-road, Beccles	do.
Surveyor's Materials	Richmond (Surrey) Town Council.	J. H. Brierley, Civil Engineer, Town Hall, Richmond	do.
Tramway Materials	Bournemouth Town Council	F. W. Lacey, Civil Engineer, Municipal Offices, Bournemouth	do.
Reconstruction of Bridge, Bournbrook-road	Birmingham Corporation	J. Price, City Engineer, Council House, Birmingham	do.
House, Shelley-road, Horsham		W. Buck, Architect, Horsham	do.
Additions to Schools	Hatfield (Yorks) School Board	H. B. Thorp, Architect, Goole	do.
Road Works, Victoria-road	Maldon (Essex) Town Council	T. R. Swales, Borough Surveyor, Maldon	do.
Five Houses, Dunmurry, Ireland		G. Sands, Architect, Lisburn	do.
Road Works	Stoke-on-Trent Guardians	Mr. Lynam, Architect, Stoke-on-Trent	do.
Twenty-four Cottages, Tweedmouth	North-Eastern Railway Company	W. Bell, Architect, Central Station, Newcastle-on-Tyne	do.
Lodges, &c., Menston, Yorks		W. H. H. Marten, Architect, 25, Cheapside, Bradford	do.
Inn, Neath	Battersea Borough Council	J. C. Rees, Architect, Church-place, Neath	do
*Annual Contracts	Metropolitan Asylums Board	Borough Surveyor, Municipal Buildings, Lavender Hill, S.W.	do.
*New Floors, N.W. Fever Hospital		Board's Office, Embankment, E.C.	Feb. 13
Villa Residences, Moorside, Halifax	York Corporation	R. Horsfall & Son, Architects, 22A, Commercial-street, Halifax	do.
Public Hall, Library, &c., Newborough, Anglesey	Rotherham School Board	R. L. Jones, Architect, 14, Market-street, Carnarvon	do.
Hospital, Huntington-road		A. Creer, Civil Engineer, Guildhall, York	do.
Additions to House, Catcliffe	Isle of Ely County Council	J. Platts, Architect, High-street, Rotherham	Feb. 14
Villas, East End Park, Cupar-Fife	Kendal Corporation	D. Storrar, Architect, Cupar-Fife	do.
Bridge, Aldreth		H. Leete, County Surveyor, Ely	do
Additions to Sanatorium	Flaxton R.D.C.	R. H. Lucas, Civil Engineer, Town Hall, Kendal	do.
Club Premises, Rotherham	Dorset County Council	Garside & Pennington, Architects, Pontefract	do.
Whinstone, near York	Milford Haven U.D.C.	J. Peters, 4, New-street, York	do.
Bridge, Purlieu, Sherborne	Tadcaster R.D.C.	Surveyor, Council Offices, Sherborne	do.
Limestone (2 000 tons)	London County Council	T. H. Lewis, Council Offices, Milford Haven	do.
Kerbing, &c., Garforth		T. Scott, Surveyor, Aberford, Leeds	do.
*Supply of Enamelled Iron Tablets	Bedford Town Council	Parks Department 11, Regent-street, W.C.	do.
Twelve Houses, Abersychan	Wokingham R.D.C.	W. S. Fletcher, Crown House, Abersychan	Feb. 15
Granite Road Metal	Chelmsford Town Council	County Surveyor, Shire Hall, Bedford	do
Laying Water Mains, Shinfield	Mr. R. Laidlaw	J. F. Sargeant, 8, Shute-end, Wokingham	do.
Twelve Cottages		Borough Surveyor, 16, London-road, Chelmsford	do.
House, Stable, &c., West Parade, Leadgate, Durham	Messrs. D. Drixon & Son, Ltd.	Robert Laidlaw, Front-street, Leadgate	do.
Baths, &c., at Adel Reformatory, near Leeds	Oswestry R.D.C.	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Additions to Warehouse, Milford-road, Leeds	Mr. W. T. Silvester	do.	do.
Broken Granite, &c.	Ayr County Council	C. H. Bull, Council Offices, Oswestry	do.
House and Stables, Boothferry-road, Goole	Liverpool Select Vestry	H. B. Thorp, Architect, Goole	do.
Road Works, Prestwick	East Retford R.D.C.	A. Stevenson, Civil Engineer, 14, Cathcart-street, Ayr	do
Road Materials, Bridgend	Rowley Regis (Staffs) U.D.C.	Glamorgan County Council Surveyor, Bridgend	do.
Road Works, Highfield, Knotty Ash	Bristol Corporation	E. Kirby, 3, Cook-street, Liverpool	Feb. 17
Granite Road Metal	Gelligaer School Board	J. D. Kennedy, Borough Surveyor, East Retford	do
Road Stone	Basford R.D.C.	D. Wright, Council Offices, Old Hill, Staffs.	do.
Paving Works, &c.	Southill Nether U.D.C.	T. H. Yabbicom, Civil Engineer, 63 Queen-square, Bristol	do.
School, Bargoed	Halifax Corporation	James & Morgan, Architects, Cardiff	do.
Sewerage Works, Kimberley, Notts.	Bradford Corporation	S. Maylan, Surveyor, Public Offices, Basford	do
Sewerage Works	St. Thomas R.D.C.	Marriott & Co., Civil Engineers, Dewsbury	do
Store Shed, Gibbet-street	Brentford Union	J. Lord, Civil Engineer, Town Hall, Halifax	do.
Additions to Market, Rawson-place	do.	T. C. Hope & Son, Architects, 22, Bank-street, Bradford	Feb. 18
Surveyor's Materials	do.	T. Bray, Surveyor, Alphington, Exeter	do
*Lancashire Boilers at New Workhouse, Isleworth	County Borough of Croydon	W. H. Ward, Paradise-street, Birmingham	do
*Laundry Machinery at New Workhouse, Isleworth	Chiswick U.D.C.	do.	do
*Cooking Apparatus at New Workhouse, Isleworth		do	do.
Oak-Fencing at New Asylum	Borough of Hampstead	Borough Engineer, Town Hall, Croydon	do.
Yearly Contracts	City of Carlisle	A. Ramsden, Town Hall, Chiswick	Feb. 19
Chapel, Sutton-road, Southend-on-Sea		S. J. Adams, Architect, West-on-road, Southend	do.
*Yearly Contracts	Commissioners of H.M. Works	Borough Engineer, Town Hall, Hampstead	do.
*Wooden Bridge over the Caldew	R. Gerrish	H. C. Marks, 36, Fisher-street, Carlisle	Feb. 20
Mission Hall, &c., Leeds-road, Bradford	Directors, Northern Baking Co. Ltd.	W. J. Morley & Son, Architects, 259, Swan Arcade, Bradford	do
Enlargement of Croydon Crown Post Office	London County Council	H.M. Office of Works Storey's Gate, S.W.	Feb. 21
Residence, Salisbury	Walthamstow U.D.C.	F. Bath Architect, Salisbury	Feb. 22
House, Shop and Offices, Grafton-street, Dublin	Commissioners of H.M. Works	W. H. Stephens & Son, Surveyor, 13, Donegall-sq., North Belfast	do.
*Refreshment House, Hilly Fields, Brockley	Metropolitan Asylums Board	Architect's Department, County Hall, Spring Gardens, S.W.	Feb. 24
*Committee Room at Queen's-road	Fulham Guardians	G. W. Holmes, Town Hall, Walthamstow	Feb. 25
Post Office at Esher	Islington Council	Hurst & Steward, 45, Parliament-street, S.W.	do.
Repairing Draining and Ventilating Subways	Borough of St. Pancras	F. H. Medhurst, Engineer, 13, Victoria-street, S.W.	Feb. 26
Chimney Shaft	Borough of Shoreditch	Board's Office, Embankment, E.C.	do.
Annual Contracts	Middlesex County Council	Town Hall, Upper-street, N.	Feb. 27
Yearly Contracts	do.	W. Nisbet Blair, Town Hall, Pancras-road, N.W.	Mar. 3
Artizans' Dwellings, City-road	South Shields Corporation	R. Plumbe, 18, Fitzroy-square, W.	Mar. 4
...ntage of Road Materials		County Engineer, Middlesex, Guildhall, Westminster, S.W.	do.
*Supply of Road Materials		do.	do.
Flags, Kerbs, &c.		S. E. Burgess, Civil Engineer, Chapter-row, South Shields	Mar. 5
Works at Queen's Hotel, New-road, Blackpool		W. Parker, New-road, Blackpool	No date
Four Houses, Wath-on-Dearne (Yorks)		J. H. Wright, 3, Cadman-street, Wath-on-Dearne	do
Sinking Coal Pit, Leeds		Mammatt & White, Civil Engineers, 1, Albion-place, Leeds	do.
Cottages, near Stowmarket		Colonel Oakes, Nowton, Bury St. Edmunds	do.
Drainage Works, Lightcliffe, Yorks		G. H Elliott, Architect, Lightcliffe	do.
*Excavation and Removal of Chalk, Wallington		Warran & Stupart, Architects, 385, Green-lanes, Harringay, N.	do.
Six pairs Semi-detached Houses, Clay Cross		Ernest Oxley, Architect, Clay Cross	do.

[See also next page.

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PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Surveyor and Inspector of Nuisances	Borough of Dunstable	80*l.* and 52*l.* (joint Appointment)	Feb. 15
*General Assistant, Surveyor's Department	Fulham Council	110*l.* per annum	do.
*Temporary Assistant, Surveyor's Department	do.	2*l.* 10*s.* per week	do.
*Assistant in Surveyor's Office	Rugby U.D.C.	110*l.*	Feb. 20
*Chief Assistant, Genl. Constn. Section, Archt.'s. Dept	London County Council	400*l.*	Feb. 24
*District Superintendents (2) of Main Drainage Works	do.	220*l.* each	Feb. 25
*Assistant Sanitary Inspector	Willesden U.D.C.	100*l.*, rising by annual increments of 10*l.*	do.
*Superintendent Plumber	Municipality of Rangoon, Burma	Rs. 300/ per mensem	Feb. 28
*Architectural Draughtsman	Waterloo-with-Seaforth U.D.C.	Not stated	No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. xii. & xix. Public Appointments, xvi. & xix

PRICES CURRENT (*Continued*).

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d.	per ft.	delivered.
„ fourths	2¾d.	„	„
21 oz. thirds	3¼d.	„	„
„ fourths	3¼d.	„	„
26 oz. thirds	4¼d.	„	„
„ fourths	4¼d.	„	„
32 oz. thirds	5¼d.	„	„
„ fourths	5¼d.	„	„
Fluted sheet, 15 oz.	3¼d.	„	„
„ 21 „	4¼d.	„	„
½ Hartley's Rolled Plate	2¾d.	„	„
⅝ „ „ „	2¾d.	„	„
½ „ „ „	2¾d.	„	„

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	2	8
„ „ „ in barrels	„	0	2	9
„ „ „ in drums	„	0	2	11
Boiled „ „ in pipes	„	0	2	10
„ „ „ in barrels	„	0	2	11
„ „ „ in drums	„	0	3	1
Turpentine, in barrels	„	0	2	6
„ in drums	„	0	2	8
Genuine Ground English White Lead	per ton	21	0	0
Red Lead, Dry	„	21	0	0
Best Linseed Oil Putty	per cwt.	0	8	6
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Elastic Copal Varnish for outside work	0	16	6
Best Elastic Copal Varnish for outside work	1	0	0
Best Elastic Carriage Varnish for outside work	0	16	0
Best Hard Oak Varnish for inside work	0	10	6
Best Extra Hard Church Oak Varnish for inside work	0	10	6
Fine Hard Copal Varnish for inside work	0	16	0
Best Hard Copal Varnish for inside work	1	0	0
Best Hard Carriage Varnish for inside work	0	16	0
Extra Pale Paper Varnish	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
Best French and Brush Polish	0	10	0

TO CORRESPONDENTS.

W. J. N.—J. B. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ARDEE (Ireland).—For the erection of a cottage, Clontail, Co. Meath, for the Rural District Council. Mr. Louis Turley, C.E., 17, Laurence-street, Drogheda:—
Michael Hughes, Ladyrath, Co. Meath* . £137 10

AYLESBURY.—For extensions and alterations at the County Asylum, Stone, near Aylesbury, for the Bucks County Council. Mr. R. J. Thomas, County Surveyor, County Hall, Aylesbury. Quantities by Mr. G. H. Blatherwick, Nottingham:—

Miskin & Son	£58,900	Webster & Cannon	£50,800
Shillitoe & Son	54,930	Benfield & Loxley	50,498
Johnson & Son	54,770	Pattinson & Sons, Ruskington, Sleaford*	49,415
Parnell & Son	53,059		
H. Martin	52,475		
Willcock & Co.	51,750		

[County Surveyor's estimate, £49,370.]

BATH.—For the erection of school buildings, Oak-street, for the School Board. Mr. W. J. Willcox, architect, 1, Belmont, Bath:—

C. Wibley	£7,236	W. Webb	£6,930
Erwood & Morris	7,041	Hayward & Wooster	6,910
Chancellor & Sons	7,019	Long & Sons*	6,148
Wills & Sons	6,037		

[All of Bath.]

BIRDWELL (Yorks).—For the erection of four houses, for Messrs. Thorpe & Robinson. Mr. Arthur Whitaker, architect, Worsborough Bridge, Barnsley. Quantities by architect:—

Masonry.

D. Furness	£570 0	Porter & Sons, Worsbro' Dale*	£548 9
F. G. Robinson	551 10		

Joinery.

J. Smith	£220 0	Hammerton Bros.	£196 7
A. Chambers	200 0	N. Mell, Hoyland*	190 0
C. Fisher	198 10	David Furness	190 0
H. Brearley	198 0		

BLACKPOOL.—For setting back the Victoria Pier entrance and offices, for the Corporation. Mr. J. S. Brodie, C.E., Town Hall, Blackpool:—
John Foster, The Blackpool Joiners, John Monk, Preston* } Schedule.

CARDIFF.—For the erection of a car depot, Newport-road, Roath, for the Corporation. Mr. W. Harper, M.Inst.C.E., Town Hall, Cardiff:—

Turner & Sons	£27,032	8	0
Allan & Sons	25,867	13	4
Evans Bros.	24,178	3	3
Thomas & Son	24,342	0	0
Symonds & Co.	23,996	8	10
W. T. Morgan	23,126	4	6
Lattey & Co.	22,867	0	0
D. W. Davies, Trade-st., Cardiff*	21,998	0	0

CARDIFF.—For the execution of road works, Columlane, &c., for the Corporation. Mr. W. Harpur, C.E., Town Hall, Cardiff. Quantities by the Borough Engineer:—

J. E. Evans	£216 16 1	E. Osmond	£194 10 2
B. F. Pomeroy	215 8 0	James Rich, Cardiff‡	150 3 9
Charles Davies	199 14 5		

‡ Recommended for acceptance by the Council.

CHEPSTOW.—For rebuilding Nos. 10 and 11, High-street, for Mr. Herbert Lewis. Messrs. Swash & Bain, architects, Midland Bank-chambers, Newport. Quantities by architects:—
Ley & Francis, 76, Raglan-street, Newport, Mon.* £1,380

GREAT STANMORE (Middlesex).—For the erection of an isolation hospital, Honey Pot-lane, for the Hendon Rural District Council. Mr. J. A. Webb, surveyor, Great Stanmore:—

Maple & Co.	£9,889 0 0	Dupont & Co.	£9,370 3 8
Turner, Ltd.	9,829 0 0	Tyler & White	8,350 16 7
McCormick & Sons	9,312 0 0	G. & J. Waterman	8,267 0 0
Hardington & Elliott	9,023 0 0	Herbert Bros.	8,090 0 0
W. Bailey	8,900 0 0	Gough & Co.	7,984 0 0
Henry Martin	8,778 0 0	A. G. Elson	7,847 7 7
R. L. Tonge	8,600 0 0	E. Herbert	7,023 0 0
W. Tout	8,446 19 9	C. Brightman, Watford*	‡6,705 4 3
Hardy & Sons	8,400 0 0		

‡ Roads and footpaths omitted.

KIRKCALDY.—Accepted for the extension of bakery at Mid-street, Pathhead, for the Pathhead and Sinclairtown Reform Co-operative Society, Ltd. Mr. D. Forbes Smith, architect, Kirkcaldy:—

Masonry.—Menzies Bros., Kirkcaldy	£795 14 3
Joinery.—D. Wishart, Pathhead	227 17 7
Plastering.—J. Easton, Kirkcaldy	147 17 6
Plumbing.—Blyth & Dougall, Sinclairtown	42 5 0
Ironwork.—J. Whitton, Pathhead	289 10 0
Slating.—R. Page, Pathhead	19 17 0
[Total	£1,524 1 4]

LLWYNYPIA (Wales).—For the erection of twelve houses, Turberville-road, for the Pontrhondda Building Club:—

T. Reynolds	£2,820	S. Rees & Co., Pontygwaith, Pontypridd*	£2,475
D. P. George	2,580		

LONDON.—For the erection of a house, Frognal-lane, Hampstead, for Mr. Henry Dobb. Messrs. Barrett & Driver, architects, 53, Blomfield-road, Maida Vale, W.:—

T. Turner	£8,970	G. Neal, Kilburn*	£4,657
Miskin & Sons	6,850		

LONDON.—For the erection of stables, &c., Frognal-lane, Hampstead, for Mr. Henry Dobb. Messrs. Barrett & Driver, architects, 53, Blomfield-road, Maida Vale, W.:—

T. Turner	£1,350	A. E. Bye	£1,235
Jas. Gibb	1,290	G. Neal, Kilburn*	1,234

* Reduced to £1,100 and accepted.

MELTHAM (Yorks).—For the execution of sewage purification works, &c., for the Urban District Council. Messrs. J. B. Abbey & Son, C.E., 34A, New-street, Huddersfield:—
Fred. Earnshaw, contractor, Meltham, near Huddersfield* £2,679

MELTON MOWBRAY (Leicester).—For the erection of a pair of four-roomed cottages, for Mr. C. J. Phillips. Messrs. Barrett & Driver, architects, 53, Blomfield-road, Maida Vale, W.:—

T. & H. Denman	£250	R. Holroyd, Abb-Kettleby*	£205

MENSTON (Yorks).—For the erection of a hospital. Messrs. Blackwell & Thomson, architects, Leicester:—

Bricklaying, Masonry, &c.—W. Flesher & Sons, Yeadon*	£8,229
Carpentry and Joinery.—Ineson Taylor, Lees, near Keighley*	1,895
Slating.—James Smithies, Bradford*	875
Plastering.—Andrew Firth, Yeadon*	850
Plumbing and Glazing.—S. Atkinson, Wakefield*	1,200
Painting.—Bilton, Menston*	253

MONMOUTH.—For the erection of school buildings, for the Haberdashers' Company. Mr. Henry Stock, architect, 9, Denman-street, London Bridge, S.E. Quantities by Messrs. Widnell & Trollope, 20, Tothill-street, Westminster:—

O. Parry	£4,807	W. J. Bloxham	£3,685
Davies & Co.	4,350	Fincher & Co.	3,550
Tradwell & Co.	3,967	Leadbeater Bros.	3,545
Willcock (H.) & Co.	3,950	Bowers & Co.	3,356
Geo. Jones	3,770	King & Sons, Gloucester*	3,298
J. Perkins	3,700		

NANTWICH.—For the erection of a technical institute, Beam-street, for the Urban District Council. Mr C. E. Davenport, architect, Nantwich:—

J. Williams	£2,695	J. Morrey	£2,402
H. Price	2,628	S. Manley	2,315
Cox & Vaughan	2,530	Birchall Bros.	2,296
J. Stringer	2,468	F. Matthews, Nantwich*	2,196
Micklewright & Son	2,436		
Stretton & Gibson	2,405		

RAUNDS (Northants).—For the erection of club premises. Messrs. Brown & Fisher, architects, Wellingborough:—

T. H. Coleman	£1,587	Kettering Co-operative Builders	£1,220
Siddons & Freeman	1,330	R. Marriott	1,300
Hacksley Bros.	1,219	Goodman & Murkett	1,290
Smith & Son	1,198	J. Lawrence	1,267
W. H. Lovell, Raunds*	1,124	F. Hensoll	1,248

SKIPTON (Yorks).—For the erection of Primitive Methodist chapel and school, Carleton. Mr. Jas. Hartley, architect, Skipton:—

Masonry.—G. Bradley, Carleton, near Skipton	£538 0
Joinery.—J. Greenwood, Crosshills	287 10
Plumbing, Glazing, and Painting.—A. Riddiough, Crosshills	114 15
Plastering.—M. A. Shuttleworth, Skipton	39 15
Slating.—Thornton & Sons, Skipton	57 0

SUTTON (Surrey).—For the erection of a block of six four-roomed cottages, for Messrs. C. T. Brock & Co. Messrs. Barrett & Driver, architects, 53, Blomfield-road, Maida-vale, W.:—

T. Skinner	£1,245	R. Roberts	£738
Somerford & Son	1,022	Ludlow & Martin, Croydon*	735
E. J. Burnard	966		

WALTHAMSTOW.—For alterations and additions to the Trinity Congregational Church, Orford-road. Mr. J. Williams Dunford, architect, 1000, Queen Victoria-street, E.C.:—

Barton	£964	Scott	£780
Dove Bros.	885	Reed, Walthamstow	730
Lascelles & Co.	818		

[See also next page.

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LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect :—

* *Recommended for acceptance.*

CLYDE-STREET.—Providing a new water-closet for teachers inside building. Diverting all internal rain-water pipes. Providing lead or earthenware pipes for chemical laboratory. Refitting boys', girls', infants', and pupil teachers' offices with pan closets, extending urinal and providing sparge pipes, refitting lavatory with fireclay basins, fixing basins for teachers, and providing new drainage throughout, properly ventilated. Schoolkeeper's house—Relaying drains, refitting closet, and providing water supply direct from main. (Second competition) :—

Ashby & Horner	£4,347 0 0	R. P. Beattie	£3,501 16 10
Martin, Wells, & Co.	4,193 0	G. Parker	3,495 0 0
J. & C. Bowyer	3,675 0 0	Faulkner & Sons	3,359 0 0
Johnson & Co.	3,671 8 6	Durbin & Katesmark	3,327 2 3
Sanitary Leadlining and Pipe-bending Co., Ltd.	3,665 0 0	J. T. Robey*	3,223 11 0
		W. Downs	3,189 0 0

EARLSFIELDS (Revised plan).—New school. Accommodation :—Boys, 320; girls, 320; infants, 322—total, 962. Graded school on three stories. Halls :—Boys, 58 ft. by 30 ft.; girls, 58 ft. by 30 ft.; infants, 58 ft. by 30 ft. Classrooms :—Boys, 48, 48, 48, 48, 48, 40, 40; girls, 48, 48, 48, 48, 40, 40; infants, 48, 48, 48, 48, 40, 40, 50. Drawing classroom, 1,234 ft. area. Heating by open fires and stoves :—

W. M. Dabbs	£29,165	Simpson & Son	£25,740
W. Downs	28,419	Martin, Wells, & Co.	25,382
J. & M. Patrick	27,745	Holliday & Greenwood, Ltd.	25,160
Lawrance & Sons	27,255	Stimpson & Co.	25,110
Holloway Bros.	26,440	Leslie & Co., Ltd.	24,997
Kirk & Randall	26,412	Lathey Bros.	24,919
Garrett & Son	26,161	F. & H. F. Higgs	24,786
Lorden & Son	25,888	Johnson & Co., Ltd.*	23,700
Treasure & Son	25,772		

GIPSY-ROAD.—Fencing off a portion of the Junior Boys' playground in order to form a playground for Infants; also forming an opening in division wall to connect this playground with the Girls' playground, including new stone steps in connexion with same :—

Akers & Co.	£215 0	Smith & Sons, Ltd.	£183 0
H. Leney	193 0	Garrett & Son	176 0
G. Kemp	185 0	E. P. Tucker	169 15
J. & C. Bowyer	183 0	A. J. Acworth*	168 0

MINA-ROAD.—Planting shrubs, &c. :—

Chtbush & Son	£12 16 0	Williams & Son	£10 17 0
A. Durant	11 10 0	R. Neal	9 5 3
W. C. Benedict	11 3 0	G. Footer*	8 3 0

PLASSY-ROAD.—Domestic Economy Centre :—

Wallis & Sons	£2,989	J. & C. Bowyer	£2,449
Johnson & Co., Ltd.	2,717	Bulled & Co.	2,408
F. & H. F. Higgs	2,598	Smith & Sons, Ltd.	2,360
Kirk & Randall	2,559	T. D. Leng	2,357
Garrett & Son	2,557	Marsland & Sons	2,327
Mitchell & Son	2,557	J. Appleby*	2,287
Lorden & Son	2,477		

PRINCESS-ROAD.—Improvements—providing infants' hall and additional cloakroom and lavatory :—

Munday & Sons	£2,386 0	General Builders, Ltd.	£2,013 0
Stimpson & Co.	2,356 0	Wall & Co.	1,994 0
Miskin & Sons	2,309 0	Lathey Bros.	1,952 0
Treasure & Son	2,248 0	Simpson & Son	1,883 17
King & Son	2,066 0	Staines & Son	1,866 0
L. H. & R. Roberts	2,090 0	E. Triggs	1,850 0
Clarke & Bracey	2,022 0	J. Appleby*	1,814 0

SURREY-LANE.—Repairs to desks :—

R. H. Galbraith	£57 13 6	H. Bouneau	£45 9 6
General Builders, Ltd.	50 0 0	T. Cruwys	39 11 0
		H. J. Williams*	30 9 6

WORDSWORTH-ROAD.—Providing new offices for all departments, with separate pans and traps; refitting lavatories and providing new drainage scheme :—

G. Bell	£3,982 0 0	Ashby & Horner	£3,762 0 0
R. P. Beattie	3,919 11 10	Lawrance & Sons	3,720 0 0
McCormick & Sons	3,918 0 0	Williams & Son	3,633 0 0
Munday & Sons	3,912 0 0	F. Bull	3,439 0 0
Durbin & Katesmark	3,789 17 0	Willmott & Sons	3,379 0 0
		L. H. & R. Roberts*	3,367 0 0

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Pryke & Palmer	3 11 9		

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The Builder.

VOL. LXXXII.—No. 3080. FEBRUARY 15, 1902.

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Elevations ..... By Mr. J. B. Fulton.
Sections ..... By Mr. J. B. Fulton.
Detail Elevations ..... By Mr. J. B. Fulton.

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Some Points in the Law of Light.

A GOOD deal of interest has recently been aroused among lawyers by an important point in regard to the law of light, namely, the right to what has been called an extraordinary amount of light.

The subject is one of equal importance to many besides lawyers, and we have from time to time noted the decisions on this point. It introduces a considerable conflict of interests. On the one hand those who desire to erect new and higher buildings are already hampered by the law of light in its ordinary form. When it confers what has been called extraordinary rights, the position of the owner of the servient tenement becomes still more difficult. It was brought into special prominence in 1900 by the decision of Mr. Justice Wright in the case of Warren *v.* Brown, in which that judge held that as long as the owner of a dominant tenement had sufficient light for ordinary purposes, he was not entitled to bring an action for the infringement of his right. This decision has recently been reversed by the Court of Appeal. Subsequently came the case of the Home and Colonial Stores *v.* Colls, in which Mr. Justice Joyce followed the decision of Mr. Justice Wright. Here again the Court of Appeal have come to a different conclusion to the judge of first instance, being guided thereto by the previous decision of another branch of the Appeal in Warren *v.* Brown.

It is easy to see how the difficulty and the conflict of judicial opinion has arisen. It has been decided that there must be a substantial interference with the supply of light, so as to render the dominant tenement substantially less suitable than it was before the interference for the purposes of business or habitation. But whereas in Warren *v.* Brown an unusual degree of light was required for the working of the special machinery for the manufacture of hosiery, which was erected in one of the rooms in the dominant tenement, some judges have held that though there was a substantial interference with the light, yet the dominant tenement could not be regarded as substantially injured, since for the purposes of nine out of ten men it would be as useful as before the interference with the light. The Court of Appeal in the two latest decisions have, however, regarded this view as faulty, because it infringes the basis of the right to protection from the Courts, namely, that such protection will be given when there has been a substantial interference with the light. In other words, the use of the light must not be regarded, but only the supply; that is to say so long as there has been a substantial diminution, that fact is sufficient. It matters not whether the light is to be used for ordinary domestic purposes or for the working of the most delicate machine. This view of the law certainly simplifies matters, but it appears not altogether to be in accord with the legal view that there must be a substantial diminution in the usefulness of the dominant tenement. It certainly also produces remarkable practical results of a very conflicting kind.

Thus there may be two buildings side by side, with rights to light over the opposite side of the street. In one a mere ordinary business may be carried on, in the other one which needs an unusual degree of light. Two separate buildings may be erected opposite these two tenements. In the one case the owner of the dominant tenement, though his light is interfered with, is practically little inconvenienced; in the other the tenant is unable, in consequence of the opposite building, to carry on his work. To a certain extent this was the case in the Home and Colonial Stores *v.* Colls, where we believe the offending building was by no means the highest in the street. It has also to be remarked that the character of the enlargement of the servient tenement may be altered by comparatively temporary circumstances; for the tenant of the dominant tenement may, after he has prevented the increase in height of the servient tenement because it interferes with a special business from some reason or other, change his place of business. The next tenant may be one who requires less light, and who, if he had been in possession when the servient building was being raised, would have made no sort of objection. We cannot, therefore, but think that the rule of law now distinctly laid down by the Court of Appeal is, to use Mr. Justice Wright's words, calculated to "impose on servient tenements an unreasonable burden and may involve grave public inconvenience." It was to some extent for these reasons that Mr. Justice Wright and Mr. Justice Joyce inclined to a view of the law which, though, no doubt, it had its judicial supporters, was, it must be admitted, opposed to some noteworthy judgments. Unless, however, the House of Lords takes a different view, the law can now only be altered by legislation.

These two recent decisions are important, however, from yet another point of view, namely, the practical vindication of the right. In Warren *v.* Brown Mr. Justice Wright assessed the damages for the infringement of the right at 100*l.* for the tenant and 200*l.* for the owner in case his decision should be reversed by the Court of Appeal, which sums, we take, would represent the capital cost of the instalment of some artificial light to give the maximum of light required for the hosiery work which was then carried on on the premises. But in Colls's case the Judge of first instance did not assess any damages, but dismissed the action altogether. And it should be noted that in this case there was no special business carried on in the dominant tenement, only one room of which, extending a long way back, was interfered with, and this was used as a counting-house. The Court of Appeal granted a mandatory injunction to pull down part of the new servient tenement. But if damages were sufficient in Warren *v.* Brown, we cannot understand why they should not have been given in Colls's case, which was only the case of a room used for ordinary business purposes requiring more artificial light.

We have many times stated our opinion that damages are the proper remedy for the infringement of a right to light, and we can conceive no better example of the proposition

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than the fact in Colls's case. Presumably, the Court of Appeal thought that after notice of appeal was given Mr. Colls should not have gone on with his work; but he had a decree of the Court in his favour, and was, therefore, presumably in the right. The circumstances were wholly different from those cases where the owner of the servient tenement, knowing that proceedings are going to be brought against him, has tried, so to say, to get the better of the law. Thus, in Von Joel *v.* Hornsey, in 1895, a mandatory injunction was granted under the following circumstances, which we extract from the judgment of the Court:—"After the defendant had received notice on Saturday that an injunction was going to be applied for he set a large number of men to work, and by Monday evening, at which time he received notice of an interim injunction, he had run up his wall to a height of 39 ft." In another case it was laid down that the Court will not interfere by way of mandatory injunction except in cases in which extreme, or at all events very serious, damage will ensue from the interference being withheld. It should be further noted that the very object of what was known as Lord Cairns's Act was to enable the Court of Chancery to give damages in place of granting an injunction, when damages were a proper and reasonable compensation.

There is no doubt, however, that judges have exercised their discretion in a somewhat contradictory manner. Thus, in the reported case of Holland *v.* Worley, in which an injunction was asked for, the late Mr. Justice Pearson refused it, but instead awarded 150*l.* damages. In the later case of Greenwood *v.* Hornsey, in which it was estimated that the damage (diminution in value) of the plaintiff's building caused by the obstruction of his ancient lights was about 600*l.*, the judge refused to give damages, and granted an injunction. That there should be this practical diversity is exceedingly inconvenient and unjust, and it is clear that legislation is needed to produce uniformity. Such legislation might be brief. It would be sufficient to enact that when there has been an infringement of ancient lights the Court shall in all cases award damages in respect thereof, except where by such infringement the building, as a whole, has become useless either as a dwelling-house or a place of business. As long as the law regards the right to light as one in respect to which the owner of a dominant tenement should be protected, some remedy must be found, but such remedy should be that most universal and most reasonable remedy, compensation by means of pecuniary damages, which in every case it is possible to assess with more or less nicety.

This brings us to another point. The Institute of Architects and the Surveyors' Institution some time ago (April, 1900) appointed a Joint Committee to consider the law of ancient lights. This Committee duly made a Report, which seems to have produced no practical result. Years ago the late Mr. Arthur Cates obtained the appointment of a Committee of the Institute, to which some lawyers were added, to consider the same question, but the work of this body was equally ineffectual. At the time of the Report of the Joint Committee we expressed a hope that it would be more than an academic document. That hope has hitherto been unfulfilled. Here, however, is an opportunity for a little bit of legislation, modest enough but of practical value, which the Institute of Architects might well undertake. Mr. Colls's case affords good ground for this action, and if the Institute does not take up the question it is obvious that it would be well not to appoint committees at all. We hope that Mr. Colls will, at any rate, endeavour to secure an alteration in the law by united action among London builders, even if the Institute of Architects does not possess the vigour to initiate legislation.

THE BELFAST MILL DISASTER.

THE verdict of the coroner's jury on the deaths of the persons killed by the recent disaster at the Smithfield Mill, Belfast, exonerates any one from the blame on the ground that the defects of the building, which caused its collapse, could not have been discovered "by ordinary inspection," *i.e.*, we presume, by the inspection of ordinary persons who had no knowledge of building; and that consequently no blame attaches to the owners of the building and the employers of the unfortunate people who were killed. This may be admitted, on the evidence; but we do not know that it follows that no blame was to be attached to any one. At all events, the fact that a building was standing which was obviously dangerous, and that it appears to have been no one's business to see to this, reveals a very unsatisfactory state of things in regard to the local arrangements for the inspection of factory buildings. This does not seem in any way to have occurred to the jury, who made no recommendation of any kind in regard to the future; indeed, they and the coroner seem to have been more occupied in bandying mutual compliments than in any consideration as to guarding against a repetition of such accidents.

From the evidence as given at length in the *Belfast News-Letter* (the London papers seem to have paid little attention to it) there seems to be no reasonable doubt that the building fell owing to faulty construction in the first instance. The following is the general description of the structure given by Mr. A. B. Wilson, civil engineer, of Belfast:—

"He stated that he became acquainted with the Smithfield Mill about eight years ago. The building was 135 ft. long internally, and 39 ft. wide. It had four floors in addition to the ground floor. The material was brick buttressed externally, with window openings—the usual mill construction. A series of columns 9 ft. apart ran the whole length of the building, and were so far removed from the centre as to allow of a passage for the workers between them and the frames. The floors were of brick arching filled in with cinders—in two cases covered with asphalt, and in all cases with tiles set in cement. In his opinion the floors were sufficient. The floors were supported by the central row of columns, which carried beams reaching across the house. One end of each beam was built into the external wall, and the other rested on the columns. The floors were laid in between the beams. The beams were of cast iron."

Mr. Wilson proceeded to state, as the result of his observations, that the building failed through the giving way of two of the brick piers, close to the ground, owing to their having too great a weight on them. There seems to have been a preconceived opinion in the mind of the coroner that the disaster had been due to failure in the supports of the machinery, which had fallen and dragged the walls down. Mr. Wilson's reasoning was that in that case the walls would have been pushed outward, whereas they fell inward. We do not quite see the force of this reasoning, for seeing that the floors were carried on beams built into the walls at the outer ends, a failure of the columns in the centre through over-weight of machinery or effects of vibration, would be as likely to drag the walls inward as not. There is no positive evidence, however, as to failure of the columns or beams; nothing to show positively whether the wrecked beams were injured by the fall, or whether they fell on account of their own weakness. On the other hand, the evidence as to the brick piers is pretty positive. They were, according to the expert evidence, of 8 ft. of area on plan, and had to carry a weight estimated, with live load and machinery, at about 80 tons per pier, or 10 tons per square foot, the greatest weight allowable for the best brickwork built in cement. Mr. Wilson states that the bricks were of poor quality; whether they were built in cement or mortar is not stated; nor (which seems a still more curious omission) was any statement made or any question asked, as far as appears in the report, in regard to the unsupported height of the brick piers and its relation to their width—surely a most important point, considering that they were evidently pulled down by the weight hanging on them from inside the building rather than by the vertical weight. It was asserted by one witness that the two piers which fell had formerly been connected by a wall between them, which had been removed; but this was denied, and at all events no satisfactory evidence of it was forthcoming.

There remains, however, the fact that a building had been erected and had been standing for many years, in which the materials and the proportions of the piers were inadequate to the weight they had to carry, and are now authoritatively stated to have been so by an engineering witness. In spite of this it appears that the proprietors had at one time contemplated adding another story to the mill, and it appears that the only reason they did not do so was that they considered it more convenient to build a new department, which they could add to in future. Nothing is said about any supposed risk to the building in adding a new story.

Now the question (which does not seem to have troubled the Belfast jury at all) is, how did it come about that a factory in which many hands were employed was, if not insufficiently constructed at the outset, at all events added to more than the walls would bear, and was standing for years in a state now said to have been, and only too conclusively shown to have been, dangerous. Mr. Snape, the Inspector of Factories, stated that he had no power to inspect buildings so as to see whether they were faulty or not, and that he had never made any inspection of the structure in question. Is this true? And if it is, ought not some competent official to have power to see whether a building in which numbers of people work is structurally safe?

It is surely not much use looking to the ventilation and the temperature of a mill-room, if the building itself unsafe.

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NOTES.

The London Water Bill.

THE discussion on Tuesday on the Water Bill of the Government by the London County Council was purely academic. The opinion of the Council that it should be the water authority for London is perfectly well known. That the proposal to establish a new authority in addition to those already existing should be challenged in Parliament is very desirable. But, all the same, the second reading of the Bill is pretty sure to be carried. Whether, however, the Government will have the vigour to carry it through all its stages is a different matter. The County Council is hostile to it, and so are the water companies; before this dual opposition it may lose its legislative life. It will be in Committee that its progress will be watched with interest, for it is there that important amendments will be proposed.

The Liverpool Overhead Railway.

THE station at the Dingle end of the Liverpool Overhead Railway, which was practically destroyed by the disastrous fire at the end of last year, has now been reconstructed in accordance with the suggestions made at the Board of Trade Inquiry. It will be remembered that the disaster of last December was caused by a combination of untoward events, but it taught the lesson of how rapidly a fire can spread in a tunnel from one end of a train to another when it is fanned by a gale, and how dangerous the suffocating fumes can be. The platform of the station is now flagged with stone and the side walls are of brick. The signal-box also at the entrance to the station has been rebuilt of brick. Wood and inflammable materials generally have been used as sparingly as possible, and the stairway out of the station has been roofed in to check to a certain extent the full force of a gale of wind from blowing through the tunnel. Elaborate safeguards in the shape of chemical engines for the extinction of fire are kept in the station. The May-Oatway automatic fire-alarm system is also installed, so that the moment the temperature rises high enough to melt the detecting wires a signal is automatically sent to the station officials and to the Liverpool Fire Brigade. The new arrangements were officially inspected last Saturday, and gave general satisfaction. With the modern form of enclosed railway motor we think that a similar disaster would be practically impossible.

Competitions in Italy.

ACCORDING to the *Tempo* of Milan, the "Famiglia Artistica" (Arts Club) of that city met on the 10th inst. to discuss the recent appointment of the Sculptor Ettore Ferari to execute the national monument to Mazzini in Rome, without any previous public competition. A numerous company assembled at the invitation of the club, and speeches were delivered condemning the arbitrary proceeding of the Government. The following order of the day was voted with unanimity:—

"1. That all works of art of a public character should be chosen in a public competition open to all artists.

2. That such competitions should be judged by a Committee of Artists, without interference from outside the profession.

3. That a Commission of Italian artists should study and decide upon the means of holding such competitions.

4. That the Managing Committee of the 'Famiglia Artistica' be charged to convey this order of the day to the authorities in the matter, and to convoke as soon as possible a congress on the subject."

These deliberations of the meeting have been communicated to all the artistic clubs of Italy, and to some across the frontier, as well as to the Italian Government and the different Municipal Authorities.

The Luton Hoo Tapestries.

THE Luton Hoo Tapestry case, upon which we have commented in its previous stages, has been carried to the House of Lords, and has resulted in the affirmation of the decision of the Court of Appeal. The judgment of the House of Lords does not lay down any new principles in regard to fixtures as between landlord and tenant, or the owner of the freehold and the executor. Still, we are inclined to think that the judgment of the Lord Chancellor emphasises the intention of the persons who placed the fixtures in the house more than has hitherto been done. It was necessary to bear in mind, he said, both the purpose of annexation and the degree of annexation; and when he came to test the present case he came to the conclusion that the tapestries were never intended to form part of the house. Lord Shand remarked that a tenant was entitled to decorate his house with pictures, tapestries, or other ornaments, or even with a parquet flooring, and on leaving to remove them if he did no other damage. The introduction of the words "parquet flooring" as an example of fixtures which may be removed by a tenant appears somewhat to increase the rule, for parquet flooring would seem to be much more in the nature of a permanent fixture than tapestries, which are really a kind of picture. The Lord Chancellor said the law had not changed (which was an agreeably conservative opinion), but the habits of the people. But we can scarcely agree with this view, for it is the application of the law in regard to fixtures which has grown more in favour of the tenant. That it will have further developments we cannot doubt, having regard to the wide scope which may be given to the idea of "intention" on the part of the person who erects something in the nature of a fixture.

Proposed Hull Town Hall.

A CONSIDERABLE controversy is going on in Hull in regard to the proposal of the Corporation to employ their official Surveyor to design and carry out a new Town Hall. It appears that the idea of a Town Hall only evolved itself by degrees, out of what was at first a proposal to build a large hotel and shops on an area of insanitary property which had been cleared. Subsequently the idea was started of building a public room over the shops, and from this it is only a step to the idea of a Town Hall, with (apparently) shops on the ground story—a wretched expedient. As the first scheme was in the hands of the City Surveyor, it comes out that he is now to be the architect of the new Town Hall. This is certainly not a satisfactory prospect for the city, and a great deal of feeling has been aroused about it. Hull is a city poor in architectural attractions, and if a new Town Hall is to be built, it should be gone about in such a way as to give some probability that the building will be one of architectural importance and an ornament to the city. There certainly seems no chance of this under the present proposals. Hull is too large and important a city to be satisfied with doing things in this kind of second-class manner.

Electricity Supply.

THE quality and the number of the papers which have been read before the various local sections of the Institution of Electrical Engineers this year proves that the sections are doing good work and more than justify their existence. The paper read recently before the Newcastle section by Mr. A. Stewart on the cost of electricity supply was a very thoughtful one. He points out that the most pressing problems to be solved are those in connexion with power distribution over large areas. The usual custom is to generate electricity at high pressure and distribute it on the three-phase system to sub-stations where the pressure is reduced, and the system is generally altered to a three-wire direct current one before the current finally reaches the consumer's terminals. One of the problems Mr. Stewart solves is to find the proper pressure at which to transmit the power to the sub-stations. He proves that at high pressures, although the price of the copper required is very small, yet the cost of the insulating material required becomes prohibitive. There is a particular pressure at which the cost of the mains will be a minimum, and he shows by an easy graphical construction how this can be found. The diagrams proving how rapidly the ratio of the cost of the insulation to the cost of the copper increases as the section of the wire is reduced are most striking, and prove that the engineer who refuses to trust to one cable will have to pay a heavy price for the additional safety given by two, owing to the greatly increased cost of the insulation. The author rightly dwells on the importance of the "power factor," or the ratio of the working current to the total current. If this ratio prove to be smaller than it has been assumed in the calculations for the design of a power scheme, then the output of the station will be smaller in proportion, and so the profits will be most seriously affected. The initial capital outlay is the most important factor to be taken into account in calculating the cost of electricity supply, and the cost of fuel, &c., is not nearly of such importance as it is popularly supposed to be.

The Haberdashers' School, Monmouth.

MR. HENRY STOCK has prepared plans and designs for the erection of school buildings for the Haberdashers' Company, at a cost of about 3,300*l.*, on a tender by Messrs. King & Sons, of Gloucester. The Grammar School was endowed in 1614 by William Jones, who gave 9,000*l.* to the Company for establishing a free school, and almshouses for twenty poor decayed men and women, each to have a separate house and garden and 8s. weekly for maintenance, with a lecturer in priest's orders, and houses for the master and usher and the preacher. The Company expended 3,400*l.* upon the buildings and site, and purchased an estate of 350 acres at Hatcham, near New Cross, London, to provide an income for the charity, which, in an official return made twenty-one years ago, is stated to amount to 4,507*l.* per annum, the almshouses and almspeople and the school

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taking 1,000*l.* and 3,207*l.* respectively. William Jones made other munificent bequests to the Haberdashers' Company, comprising his house in Sithes (since Sise) lane, London, and capital sums of about 7,000*l.* in the aggregate, now largely increased in value by subsequent investments.

The "Old Rectory," Beaconsfield.

THIS building, which, as some say, is the oldest parsonage house in England, and was recently reinstated by Sir Edward Lawson in memory of the late Lady Lawson, has just been vested in three trustees and dedicated to parochial purposes. Its erection was begun in or about 1500, when the rector, Richard Capul, left 40*l.* towards the building, and was completed in 1543 by Richard Rawson, Canon of Windsor and Archdeacon of Essex; the house served for a while as a sub-priory to the Benedictine convent established in 1265 at Burnham, in the same county, by Richard, brother of Henry III. and King of the Romans. Constituting one of the most perfect and unaltered examples of its time, it is planned with three sides, and a high wall with gateway, about a quadrangle. The basement story is constructed entirely of brick, glazed with chequered patterns; the upper story, of which lofty gables and dormers break the roofs, is built of large timbers closely spaced and plastered between. To the north side is attached the principal staircase, within a semi-cylindrical turret of timber—a curious and picturesque feature of the design. The amount of timber used in the building is, indeed, surprising; the floors were formed of enormous planks, and the steps to the floors and of the stairs of massive blocks roughly shaped with the axe. Darkened passages are framed with solid tree trunks, which were also used for partitions, where the builder of our day would consider thin boarding to be sufficient.

Ruskin Monument, Westminster Abbey.

IT is not easy to find the modest memorial to Ruskin in Poet's Corner. It is a circular bronze medallion hung high up on a dark part of the south transept wall, above the bust of Walter Scott (a neighbourhood Ruskin would have liked well enough), and partially screened from view by a large monument standing nearly in front of it. The medallion, something over 2 ft. diameter, is in what may be described as a dish form, with a decorative border of foliage, apparently, round the rim; but there is too little light to see what the detail is, or even whether the name of Ruskin is worked into the design. The head, a side-face in high relief, is better discernible, and is a good and characteristic likeness. The whole style of the thing we quite approve, but it is not done justice to in the position in which it has been placed.

The late Mr. Sidney Cooper.

THE long artistic career and persistent energy of the late Mr. Sidney Cooper, who continued the exercise of his art almost to the very close of his ninety-eight years, has naturally excited many expressions of interest and respect, in spite of the fact that the pictures of his later years did not much gratify the more discerning section of the public who visit the Royal Academy exhibitions. In making a fair judgment of Sidney Cooper's art, however, there are two or three points to be considered. He must not be judged by his later works, in which, while his able drawing of cattle in repose remained the same as ever, his eye for colour and texture had manifestly decayed. Nor must his earlier works of this class, which were excellent in their way, be judged from the artistic standpoint of the present day. His art was developed at a time when highly-finished realism was considered (in this country at least) a main object in cattle and landscape painting; and the development of a taste for a broader and more powerful manner in painting left him behind—the more decisively in consequence of his long life and his continued appearance before a generation brought up in a different artistic atmosphere. His earlier cattle pictures, in their simplicity of design and a certain element of tranquil repose which pervaded them all, justified the comparison with Cuyp which was often made, though Cuyp's warm sunlight was not in them. But that Sidney Cooper was capable of more than this is shown by his large and little-known picture of the repulse of the French cuirassiers by the English cavalry at Waterloo. This was purchased by or for some public institution in Liverpool, and is we suppose still in that city. It is one of the best battle-pictures ever painted in England; there is one group on the left, of two horsemen engaged in single combat, which is masterly in design and vigour of action; and any one who had seen this picture would have quite a different idea of Sidney Cooper from those who only knew his later works at the Royal Academy.

STAINED GLASS.*

THIS paper upon stained glass is intended to deal with the technical side of the subject, and to be descriptive of its different stages and processes. The time at my disposal, and the wide field which the technique in stained glass covers, deter me from plunging into the history of the actual process of its manufacture, or of showing the prominent place it takes amongst the applied arts. But I feel that some mention should be made of the evolution of the leaded or painted window as an architectural adornment from the domestic and fanciful purposes found for the uses of glass in ancient times. We find the Egyptians and Greeks made coloured glass cups, vases, urns, rings, beads, and articles for games, and that they were most expert in imitating in glass precious stones. The discovery or invention of glass may, with great probability, be attributed to the Egyptians, but considerable doubt has existed on this point, for it has been assigned by some to an earlier people. The glass of the Egyptians was generally opaque, and always coloured. There exist many skilful examples of the glass-worker's art of ancient times, and perhaps the most representative of them are coloured glass vases, having the enrichment of figure work upon them, and treated like a cameo. I do not think we have reliable evidence of the date when glass was first utilised for the purposes of a window. It is recorded that window glass does not appear until about the third century, evidence of this existing from fragments found at ruined houses at Herculaneum, and small doubt existing about its use for the same purpose at Pompeii.

The term "stained glass" is very generally misinterpreted, and is accepted by many as painted glass. Stained glass and painted glass are two very different things; stained glass is coloured glass with a vitreous pigment upon it, and painted glass is white glass with enamel colours upon it; the colours applied here are enamels of all shades, but manufactured also with a vitreous substance to render them adhesive to glass when fired in the kiln. Stained glass is composed of coloured glass; the actual colour is in the material itself, manufactured from various stains and chemicals. There are many in kind, but for richness, brilliancy, and durability, antique and pot-metal glass stand alone, and very beautiful materials they are. This glass, to briefly describe its manufacture, is blown in cylinders, each, of course, being coloured from its respective pot. The cylinders having been formed on a glass-blower's pipe, it is cut down one side and placed in a dividing kiln, where it is allowed to fall upon a flat bed. Each cylinder comprises one sheet of glass, varying in size 20 by 30 in. Another process of making antique glass is by blowing it into the shape of square bottles, which are subsequently cut open, the four sides and bottom forming small sheets. In this process the metal is blown into a mould which is partly open, but which is closed up when the glass blower has well circulated his metal and gives it a final blow. The object of this process is to obtain a texture which is far richer than that blown in cylindrical form. This, however, is a more expensive process, and hitherto it has not been possible to make the sheets larger than 9 in. by 5 in. It will be observed that a great thickness is to be had in this glass, which enhances its brilliant quality and makes it very strong and durable.

Many varied effects are to be secured in these two kinds. In yellow, blue, ruby, and brown glasses we have streaks of other colours, which sometimes take curious forms, and by careful manipulation of them in a window very happy results can be arrived at. There is a distinction between pot metal and flashed glasses. All colours, except flash glass, are called pot metal; the colour in them is of solid density through the glass. Flash glasses are two in kind—ruby and blue. A thin film of ruby is mounted, as it were, upon other glasses, such as white, neutral white, yellow, and blue, and a blue glass is mounted upon white and neutral white. These are technically known as ruby on white, ruby on yellow, ruby on blue, and blue on white. Many varied effects are obtainable from the flash glasses. By the aid of fluoric acids this film of colour can be removed, thereby revealing the colour beneath it. And so, presuming a gradation of many colours of a lasting nature were required within one leaded space, it would be possible in the following way: Select a flash ruby on white and cut to a certain shape, then take a flash blue on white and cut exactly to the same shape, acid the ruby away in one part of that shape and acid the blue away in another, stain each piece where required with a yellow stain and place one upon the other: the colours arrived at are pure ruby, pure blue gradating to purple, green, white, and orange. This merely illustrates an extreme example of what can be arrived at, but it will suffice to show that a very rich garment can be portrayed very faithfully in stained glass, although the process is time taking, and that the beauty of the material places this branch in the applied arts to very great advantage. The designer, in carrying out a design, finds processes of this kind very fascinating. When one piece of glass is leaded behind another, and it is a legitimate process to do so, it is called plating. The manufacture of glass is a separate and distinct industry, and does not directly concern the stained glass worker. It will be seen that the coloured material itself, cut up into many pieces, and having in its composition a great amount of lead-work, is the process to which the term "stained glass" can be correctly applied. This process is extended and enriched by the application of painting to produce greater expression of form. The hard trace lines, the style of painting, and the black lines of the leadwork, render the effects most suitable for the purpose it is intended, and these must essentially place it on the basis of sound principles in decorative art. The term "painted glass," to which I originally referred, consists of the application of enamelled colours on white glass, and the coloured effect is solely derived by this means. In this process the pieces of glass are very much larger than those in stained glass. In enamel painted windows the tendency is to produce the pictorial rather than the decorative. Most of this kind of glass comes from the Continent. (Peterhouse, Cambridge, Glasgow Cathedral, Stoke Pogis Church.)

In stained glass the only mediums for painting are pigments known as red tracing colour, brown shading colour, flux and silver

* A paper read at a meeting of the Architectural Association Discussion Section, on Friday, the 8th inst., by Mr. J. Dudley Forsyth.

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stain. Coloured glass is the most vivid form of decoration, and consequently has very strong influence on surrounding objects, and unless these objects and the surrounding situation are personally studied, the designer cannot know in what harmony his work is to be. I have touched but lightly upon the history and manufacture, but as my paper is intended to treat of the practical side I will now deal with the various stages in the designing and making of a stained glass window.

From the point of view of decoration, a window, or the glass surface of it, is architecturally a structural plane, having the relative value of a wall. But its chief purpose is to admit light and air. Therefore, the embellishing of it must in its kind be flat, conventional to certain limits, and not pictorial. The nature of the material also governs and requires this, and the straining after naturalistic effects is rendered false by the transparency of the material and because of the heavy black constructional lead line that must of necessity surround and support a piece of glass upon which might be a delicately-painted natural sky scene effect. That sky scene effect should have been conventionalised to suit the requirements of the material.

The usual method of proceeding in the treatment of a stained-glass window is to commence by making a coloured sketch design, which shall be meant to convey the general idea of what is intended. The forms of the window openings govern the selection of subject. The general massing of a coloured composition must be the first consideration. The next point of importance is the arrangement of metal bars, which are part of the construction. Having apportioned the spaces to be filled with figures and other features, the designer will have overcome much of the difficulty in a design. His next care is to draw the figure subjects, giving chief thought to their composition; draw in the accessories, as grisaille and other backgrounds, canopies and borders such as he may consider applicable to his design, and then colour it. The lead lines should be clearly indicated in this sketch. But it is next to an impossibility for a designer to successfully attempt this without inspecting the actual situation of the window which he is to treat. It is imperative that he should do this. Other reasons as to the advisability are that the designer is able to judge of the proportions of size and detail his figure subjects should be, and what strength of painting is necessary, and whether that painting shall be broadly felt or not. Scale is a very important point in a window, and much depends upon it. It is not well to draw figures too large, and so dwarf the window and the building; nor is it wise to draw figures too small, especially single standing figures, and so convey unduly large proportion. The designer, when visiting a building for the purpose of judging the best means of decorating it, very often receives immediately in his mind an impression or inspiration which invariably turns out to be the best. First impressions of this kind apply as much, if not more, to stained glass decoration. The character and style of the building should materially assist in designating that of the decoration. The situation of the window as regards the light is another point where much care and study are demanded. The varying light of day, and particularly the sun's rays as they veer round from east to west, taken with the necessity of admitting light to the building, is perhaps a perplexity under which an artist has to labour, and unless he acquaints himself with its force and effect in the building, he cannot be satisfied that his production in key of colour and depth of tone is well suited. In the windows of the south side of the building, through which clear sky can be seen, the scheme of colour and tone may be a good deal stronger than that on the north side. The sun when shining through stained glass seems to obliterate the painted work upon it. The morning sun does not, however, seem to be so detrimental in this respect as the afternoon sun, when it shines with a very great glare through a west window. This force of light might be very much or very little retarded by objects outside the building, such as houses and trees, and if these objects are permanent they would naturally have important bearing upon the treatment of windows. In the windows of a building which is cold and bare in its stone masonry it is well to avoid pure blues and cold greens, which, if they must of necessity be used, should be well toned down. Should the interior have warmth in its construction and furnishings, then the blues and greens might be clearer, but not to appear garish, and the value of the material itself not so subjected to shading colour. Pale whites in a window where strong colour predominates are apt, unless very carefully tested, to be treacherous. Strong light has the effect of accentuating their presence, and they seem to gain in size and whiteness as distance separates them from the spectator. Pale white glass can be safely submitted to heavier painting than many other glasses, and unless the tone on them be of relative intensity they will at no great distance tell out as unaccountable and regrettable spots in the window. It will therefore be seen that with such numerous local conditions it is impossible for a designer successfully to undertake work of this nature without a thorough personal inspection of the position and its surroundings. I do not see, therefore, how work, architecturally correct in its application, can be chronicled in a catalogue to fit or be made to fit any window, because it is most unlikely that different windows have the same situation and surroundings.

Having completed his coloured sketch design, the designer's next step is to draw the full-sized cartoon, which is set up from templets taken from the actual window openings. Then are drawn the constructional bar lines. In drawing the cartoon the figures and other subjects demand more careful attention paid to their composition than the designer gave them in the sketch, which was little more than a scheme of colour. Special studies should be made of groups of figures both in the massed composition and individual pose, for here the designer's skill is put to the test, like the painter or sculptor who is engaged upon probably the most critical part of his work. The cartoon may be drawn in various mediums, but chalk and charcoal are, perhaps, most generally used. Here the figures and other subjects are set up from the studies, having every possible care taken in accuracy of drawing and beauty of line. The outline should be drawn with a hard, distinct line, being made stronger or finer as the position of the window may require; that is to say, a window that is high up would necessitate stronger lines than a window that is nearer the eye. The subjects are then shaded, as light and shade would appear upon them. The lead lines are painted or drawn on, and they are added to the cartoon after the figure and other subjects are drawn, but preferably before the cartoon is shaded, for by so doing careful drawing can be maintained, and the lead-work having its due value, governs the strength of shading. The cartoon can only be successfully drawn by a designer who is thoroughly experienced in the practical parts of glass-cutting, glazing, glass-painting, firing, &c., because he is designing and directing these different employments. His knowledge of glass-cutting will enable him in his cartoon to lead up his figures in a natural manner; that is to say, each piece of glass which he is using shall be simple in shape, avoiding such forms as would be most liable to break. When leaded up and cemented, the handling of the work, or the pressure brought to bear by the wind and gales, would break such weak points in the window. His knowledge of the glass and glass painting will dictate that he shall shade his cartoon in a manner consistent with the technical requirements of that material and craft. For instance, if a drawing is to be made or a garment to be cut in a deep, rich colour, the designer will avoid heavy shading, for a deep colour in glass does not require so much pigment upon it as a light glass. The beauty in the material should be preserved. In adding to his drapery ornamentation of diapers and borders, and other details which he has decided will be most effective in silver stain, the draughtsman will know that he cannot have a diaper here or a border there, because in colouring his design the glass required for that garment will not stain well. The explanation of this is that many glasses are so hard that they will not take a stain, and when stain is applied to them and fired, it comes from the kiln in unfortunate brown patches. His knowledge of leading or glazing will enable him to show with practical accuracy the broad divisional lengths in the window, and he will arrange his detail accordingly. It will readily be seen that the composition of the design is dominated by these materials and processes; but by the aid of these materials and processes the artist has very wide scope for design, refined in its conception and with individuality in its execution. When the cartoon is finished a tracing of the lead lines is made on tracing cloth. This is called a cut line, and is a working drawing for the cutter. From this he cuts his glass. It is here where the designer's careful and personal attention is required; it is here where the harmony of colour for the window will depend. The designer had his intentions regarding the coloured glass and the special quality of texture for his work, and he should be here to select it for the cutter. The cutter, no matter what his capacity may be, cannot be acquainted with the motives and ideas of the designer, and should not be allowed to select the glass himself. The sheet of glass is laid over the cut line, and the line to be followed, which can be seen beneath, is impressed on the glass with a steel wheel or diamond. Every piece of glass in the window is cut in this manner. When all the pieces of glass are cut by the cutter, they are arranged out in their respective positions upon the cut line, near the glass painter's bench, who in turn finds separately their positions on the cartoon, and from that traces upon the glass all the outlines in red tracing colour. The glass, with these lines upon it, should receive a light heat, known as *lines fire*, so that these trace lines can be indelibly fixed upon the glass. The object of this will be presently seen. This process having been gone through, a glass painter's plate, or easel, which is a large sheet of plate glass framed in wood, is laid over the cut line, and upon it is placed each piece of glass in its position corresponding with the cut line. These pieces are made to adhere to this plate by the insertion of hot wax; the plate is then held up to the light for painting. There are two or three methods or styles of painting, but the one most widely practised is termed the stipple. This method is done by applying the brown shading colour in a moist state upon the glass, with a brush known as a flat, and then with another hard brush a stippled matt effect is obtained, and allowed to dry. Unless the trace lines are indelibly fixed upon the glass this process would wash them off. When dry the lights are gradually removed with soft brushes, and the shading of the cartoon carefully followed. This process should be repeated by stippling again over that surface for intensity of tone. Another method of painting, most effective for fine and delicate work, is that known as a flat matt, but this is a more intricate process.

For two reasons the glass requires two or three firings: first, to arrive at excellency of painting and to make it permanent; second, because it is a sound test as to its durable quality.

Having had a second and very hot fire, the glass is stuck up for a second time upon the painter's easel to receive its finished painting, when subtleties of tone and expression are felt. This completed, the glass is again fired and receives a cooler heat known as the *finish fire* or *stain fire*, because it is in this last process that the silver stain is added, and requires a cooler fire, and that only once. Should stain receive too hot a fire, or go through the kiln twice, it will come up too deep in colour.

Stain is pure silver and is mixed with a yellow lake, the component parts being about 12 of lake to 1 of silver. Flux is sometimes painted on white glass for the deadening the brilliant light which might render that portion of the window overpowering.

It will be readily understood that glass painting is a very important process in the making of a stained glass window. It is manipulating the material itself which is to remain evidence of a certain designer's work. Therefore, as many subtleties are requisite, relative tones properly produced and points in the cartoon faithfully and characteristically followed, the designer should interest himself in no small measure to see that these are artistically and thoroughly carried out. He should be able to paint the more important parts of the glass himself, and unless this is done I do not see how his individuality is to be preserved. He should not rest satisfied that his efforts in the sketch and cartoon are all that are required of him. His own personal work and supervision are seriously required on the glass itself. Apart from the necessity, glass painting is interesting to the designer, and in practising it he is ever acquiring knowledge of technical points in which this craft abounds. From the finish fire the glass is placed in the glazier's hands.

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Glazing, of course, is a more mechanical process, but not devoid of interest. The many pieces of glass which a window will comprise are to be held together with lead. The lead should be pure, and a worker in stained glass should boil down the lead, extracting the dross so that he really does use it pure. The molten lead is poured into a mould and castings into a rough section taken. These castings are then past through a steel vice, to which are fitted cheeks of various sizes, and strips of lead are turned out accordingly and ready for use. The glazier's occupation is to take down the cut line on his glazing bench, laying in its respective position each piece of the finished glass, then proceeding in a systematic manner to lead them up. When leaded up the glass is bound to have a different effect than it had when on the painter's easel, for the reason of the black lead lines. Some of the results will be disappointing to the designer, and he will require to make certain alterations for their improvement. For this purpose, therefore, the cutter merely solders the lead joints on one side of the window, so that glass which has to be altered can be easily removed and the improved pieces easily inserted. It will be remarkable indeed if the effect at this stage is in every way satisfactory. Alterations having been approved of, the window is soldered on the other side and the cementing process proceeded with. The interstices between the lead and glass on the inside or painted side of the window are filled with putty, and those on the outside are filled with a cement composed of whitening, boiled oil, red lead and turps, which is applied with a hard brush, passing all over the surface of the window. Cementing is obviously to render the window weather proof, and to add to its stability and strength. When thus completed and cleaned off, copper bands are soldered on the inside of the light, to be twisted round the metal bars when placed in its final position.

I have endeavoured to give a full description of how, in my opinion, stained glass should be worked. Reference to styles of different periods has been avoided.

I would like, if you will allow me, to say a word in protection of the stained-glass worker. He need not necessarily be a "light excluder," an appellation which I have heard assigned to him.

Apart from its use in a church, I consider stained glass very suitable for domestic decoration, and it cannot be denied that the effects which are obtainable in it can be made to greatly beautify the interior.

MAGAZINES AND REVIEWS.

THE *Architectural Record* (New York) contains an important series of articles in its issue for the present quarter, of which perhaps the most interesting to English readers is that on architectural work as at present carried out in Paris. It is written by M. Allain, architect to the city of Paris, and gives plans and illustrations of several important recent buildings in Paris, especially the remarkable house built by M. Janty for the Prince Buonaparte; remarkable for its plan and for the completeness with which every portion has been studied, though we are far from saying that it is a kind of architecture that has our sympathy. M. Allain gives among other illustrations a sketch elevation of M. Esquié's design for the Opéra Comique, and wonders that it was not selected; certainly M. Bernier's design as a whole is commonplace, and this is not; but although the details of M. Esquié's design have a remarkable vigour and freedom, the great arched cornice which frames in the whole design is quite out of scale, for a large building; on a small scale such a design would be very effective, but one is surprised to find an eminent French architect, with all his academical training, apparently so forgetful of scale. The article by Mr. Schopfer on "Ceramics in Architecture" deals mainly with what are called the "sharp fire ceramics," or ceramics fired at a great heat, by a process perfected by a French chemist, M. Bigot. If the illustrations to the article on "The Contemporary Suburban Residence" show the general tendency of American small country house architecture at the present moment, it seems to have deteriorated rather in picturesqueness and character from what it was fifteen years ago, and become prosaic and matter of fact. The illustrated appendix shows a great many very interesting and in many cases admirable examples of recent American city architecture.

The *Berliner Architekturwelt* is largely occupied with the illustration of the Wolzogen Theatre, of which Herr Endell is the architect, and which appears to represent the "new art" *in excelsis*, the decoration seeming all spikes and wires. Clever it is, undoubtedly, but utterly destitute of repose; or rather, one might say, utterly exasperating in the persistence of eccentricity in every detail. It is impossible such a taste can last, and before more than a few years are out people will be wondering how they ever came to put up (or to put up with) such architecture. One or two new roadside stations on suburban railways at Berlin are interesting and commendable as examples of an attempt to give a special character to railway architecture.

The *Architektonische Rundschau* illustrates in its last edition German work only, including some stone-fronted street houses with good deal of character, and the front of the Konigliches Land-und-Amtsgericht at Berlin, a piece of very rococo modern Classic, not without a certain vigour and "go," which is what the Germans seem to aim at in buildings of the Classic type. The interior of the Fest-Saal in the Künstler-Haus at Munich, by Herr Gabriel von Seidl of that city, is a riotous but original piece of decorative effect.

The most interesting article in the *Art Journal*, to our readers, is likely to be that by Mr. Lewis F. Day on "An Heraldic Artist of To-day," Herr Otto Hupp, of Munich. We entirely agree with Mr. Day in the opinion that Germany is supreme in the treatment of heraldic decoration; there is a boldness and vigour in German treatment of this class of design which one finds nowhere else. As Mr. Day observes, "Heraldry is not precisely a modest art—the business of its designer is to blazon forth the pride of ancestry, even defiantly; and here is an artist who does it with the assertive emphasis befitting the proud office of herald." The numerous illustrations of Herr Hupp's work completely bear out this judgment. An article on "The River Wye," illustrated by Mr. A. R. Quinton, is enough to make all who have not already done so make a tour up the Wye. An original etching, by Mr. Haig, of Linlithgow Castle, forms the frontispiece to the number.

The *Magazine of Art* is largely occupied with special consideration of the works of several artists. Mr. Spielmann contributes a sympathetic critical article on the works of Onslow Ford, a very well-balanced piece of criticism, doing full justice to the beauty of Ford's work, while declining (and we think rightly) to class him among the great sculptors. We concur in the opinion that "the most fascinating of all Mr. Onslow Ford's works were his statuettes of the female nude." These, with the pedestals which form an integral part of the whole design, are perfect works of art, and of a marked individuality of treatment and conception. An article is devoted to the work of that admirable and original painter Mr. Melton Fisher, numbering among its illustrations a reproduction of a study for the figure in "Dreams." Another article is devoted to that (in our opinion) much over-rated caricaturist, Rowlandson. An article on Goya, signed "S.," is completed from a former number. Goya's name, says the writer, will be remembered for his best work; "but while his art will always retain a great measure of approval, the man himself will be thought of with scorn and contempt." He seems to have been a man who hated every one and was always quarrelling, even with his sitters, whom he bullied remorselessly. "English and Foreign Schools of Art—a Comparison," is the title of an article by Mr. James Ward, the headmaster of the Macclesfield School of Art, in the course of which he observes that "England is now leading the way in the matter of design as applied to art manufactures," which we believe to be perfectly true; and Mr. Ward says that he has found this to be admitted by eminent professors in design in Germany, France, and Switzerland; and that, in fact, our Continental neighbours are more alive to this condition of things than the majority of our own people. The illustrations of English and French applied art which accompany the article certainly sustain this view.

The *Artist* contains a witty and amusing satire on "The New Art," by Mr. Harry S. Curry, illustrated with slightly exaggerated setches of some of the favourite forms of house, and the long tapering square columns and wide shallow crown moulding which form the elements of the most recent style in furniture design. Very young architects should read this essay; it may do them good. Mr. Horace Townsend contributes an article on "Some Recent American Silverwork," with some examples which, we confess, do not fascinate us much.

The *Art Worker's Quarterly*, edited by Mr. G. Paulson Townsend, is a new periodical devoted to the illustration of and to critical writing on, the class of artistic production implied by the title. Such a publication seems to supply a want, and the first number certainly promises admirably; the illustrations are numerous and beautifully executed, and represent designs, old and new, for woodcarving, embroidery, lace, bookbinding, leather-work, &c. Among the articles in the first issue are "Morris's Work and its Influence," by Mr. J. Scarratt Rigby; "The Modern Illuminator," by Mr. E. F. Strange; "Intarsia or Inlay," by Mr. Stephen Webb, &c. The typography is excellent in style, but we wish the promoters could have dispensed with the affectation of calling the preface a "Foreword." Is the King's English not good enough for them? There is nothing artistic in this kind of pretentiousness of diction.

To the *Antiquary* Mr. E. C. Vansittart contributes an article under the title "Roman Curios," on some little-known and out-of-the-way curiosities of the Eternal City. Among these is mentioned the crucifix carved high up on one of the antique columns in the Piazza di Pietra. The explanation is that in days when Rome was a mass of ruins, huts used to be erected against the remains of the temples, and from the roof of one of these some Christian inhabitant may have carved the symbol of his religion on the Pagan column. Under the heading "Ramblings of an Antiquary" Mr. George Bailey gives an account, with some sketches, of the old hall at Mickleover, Derbyshire.

In *Fcilden's Magazine* Dr. Drysdale substantially reproduces the paper he read recently to the Institution of Electrical Engineers. We think his method is open to the criticism that the same information about the magnetic qualities of the iron could be obtained very much more easily by a pocket-charm compass. Until Dr. Drysdale gives definite information as to the accuracy of the method it is unlikely that experts will go to the trouble of drilling such elaborate holes in the iron to be tested. When rough comparative tests only are desired there are plenty of simple laboratory methods available. In the same issue Professor H. Smith writes a valuable article on "The Mathematical Laws Governing the Development of Profit in Industry and Commerce." The moving cause of the article is that, while formerly managers of works were, for the most part, the men who furnished the money with which to run them, in the present day the holding of the capital has become gradually divorced from the skilled knowledge that directs it, and the investor has no technical acquaintance with the work by help of his capital. The object of the article is to put in algebraic form a method of estimating the proportion of outlay to return, and demonstrating this by graphic curves of averages; in short, to reduce investment in works to a scientific law. Another article in the issue is on "Recent Developments in Lighthouse Engineering."

Mr. Isaac D. Parsons contributes an interesting article on the economy of "Isolated Electric Plants" to the *Engineering Magazine*. He gives tables showing the comparative cost of public and private supply of electric power to residential flats, hotels, and clubs in New York. In nearly every case it is shown that there is a decided economy in generating electricity from a private plant. Even when the plant is small and the cost of the electrical energy comes to much the same as if it were taken from the mains of a supply company, yet the waste steam can be used for heating purposes, and hence the gain is on the side of the private supply. Mr. Parsons considers that if the Central Station could supply steam for heating as well as electricity for lighting, then private plants would very rarely be more economical. This may be the case in New York, but in this country, where gas engines can be worked economically, his conclusions will have to be considerably modified. It seems to us that the most economical solution is to use a combined supply that is to have a small private

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plant always working at its maximum efficiency and to take an additional supply of energy from the mains of a supply company to help carry over the maximum demand. We know of one case in London where this is done with most satisfactory results. In the same number Mr. S. F. Walker describes the modern electrical appliances used in shipbuilding yards. The use of electrical driving enables belts to be dispensed with, and so the whole of the machine-shop can be swept by means of a crane without the necessity of having all the machines in one line. He points out that there is a limit below which it is not wise to multiply motors. Heavy machine tools which require four or five horse power are better driven separately, but tools making a small demand for power are often more economically driven from a line of shafting actuated by an electric motor. In the same issue Professor Boyes continues his valuable and interesting analysis of various "Practical Applications of Reinforced Concrete," with numerous diagrams. The present article deals mainly with the Cottançin, Bonna, and Hennebique systems. The first-named, which has already been described in our columns, appears to us to be better suited for temporary structures, such as exhibition buildings on a large scale, than as a method of permanent building. The system has been employed in the new church of St. Jean, at Montmartre, with a result that we understand has caused great dissatisfaction in the artistic world of Paris; and judging from the illustration given here, we should say with very good reason. The Hennebique system appears to have been used with much success in some large engineering structures, and in a portion of the buildings of the late Paris Exhibition.

The *Quarterly* contains an important article on "Mantegna," in which the writer commences by remarking on the present tendency to the study of early periods both in regard to Greek and to Renaissance art, which he attributes to the same cause—there is a problem about it: we know less about the art and the artists of these early periods, and there is a promise of fresh discovery, which "acts as a gymnastic for the æsthetic faculties." The author condemns Morelli's too practical and superficial method of detecting the work of a particular master by certain persistent forms of ear and hand, as open to a great deal of misuse and leading to wrong attributions; on the other hand, he declines, and we think rightly, to accept the late Charles Yriarte as a critical guide in the attribution of Mantegna's works. Yriarte was an eloquent and picturesque writer on art, with a certain basis of study, but who was really more concerned with æsthetics than facts, and (like other French writers on art) was rather apt to assume as true what it pleased him best to believe. Herr Kristeller's work, which has been translated into English by Mr. S. A. Strong, is recommended as written with a more serious sense of responsibility, his book, along with those of Berenson and Miss Cruttwell, forming the main occasion of the article. Those who are interested in the works of this peculiarly individual and suggestive painter, whose solemn and bronze-like figures have in painting something of the quality of Dante in poetry, will find the article a useful *résumé* of the subject and of the quarters in which to see the best information with regard to it.

The *Monthly Review* contains a rambling article on "Art and the Public Money," by Mr. Alexander J. Finberg, the main thesis of which seems to be that art is a matter of usefulness rather than of enjoyment; that we have never had any attempt at a complete and logical analysis of works of art, to discover what kind of art is most useful and helpful to the nation; and that until that is done "no Government would be justified in spending one penny of public money in the direct support of any kind or branch of fine art." Greater nonsense we never read. Art cannot be subject to analysis like science, or to defined rules of what is good or bad; nor is art for use but for intellectual enjoyment, the nature of which also is such that it can only be felt and not defined. What Government can do for art is simply to afford as much opportunity and encouragement as possible to the production of works of art on a great scale—as the French Government does, and as ours unhappily does not. From this article we turn with satisfaction to the admirable and closely reasoned one on "British Industry and the Wage System," by Mr. Ralph Neville, K.C., who sums up, as other writers have recently done, in favour of co-operation or profit-sharing as the real road out of the present difficulties—the one way to give an incentive to the best exertion on the part of the artisan; but in the course of the article he draws attention to some points in connexion with the relations of labour and capital which are often overlooked. The article is one worth the attention of all who are practically interested in the subject.

The *Pall Mall Magazine* opens with an article on "The Great Queen's Monument," in other words, on the design for the Victoria Memorial, by Mr. Frederick Wedmore; and an excellent piece of architectural criticism in popular form it is; we do not think that we can find anything to question or to differ from in it. Magazine articles on architectural subjects are frequently so exceedingly weak and inadequate, that it is gratifying that in the case of this important competition the general reader has had some really sound architectural criticism offered to him. The article is illustrated by excellent sketches of different portions of the various designs, executed by Mr. Hedley Fitton. The article "Hunting for a Planet" is an exposition by Professor George Forbes of the methods employed in searching for a planet or a comet suspected to exist but not yet seen—including, of course, a reference to the specially interesting history of the discovery of Neptune. We gather that there is now a suspicion among astronomers of a further possible planet beyond the orbit of Neptune.

Mr. Herbert Paul's article in the *Nineteenth Century*, on "Art and Eccentricity," is misleading in its title, as it is really a literary article, and has little or nothing to do with "art" as we in these pages understand the term, except that the criticism against a disagreeable and inartistic realism in works of imaginative literature may be applied also to much in modern art. Mr. Percy Macquoid contributes an article on "The Collecting of Old Silver Plate." It is to a great extent an article of warning to less learned collectors as to the extensive manufacture of forgeries. To forge English plate of the seventeenth and eighteenth centuries is stated to be both a very easy and a very extensive branch of industry. The work of forging plate of earlier periods requires a mind of a higher order:—

"The French craftsmen have for some centuries proved themselves without rivals for dexterity and accuracy of finish in all brances of metal work; when their strong perceptions of grace and beauty, together with a correct archæological knowledge, are devoted to the art of forging, the deception is not only most difficult to detect, but the articles produced are often very beautiful. From these sources some remarkable frauds in silver work purporting to be of the fourteenth, fifteenth, and sixteenth centuries have in the last fifteen years found their way into both museums and private collections. I purposely withhold names, but the forger, his agents, and the victims are now fairly well known. As a rule, some portion or other of the object is original and of the presumed date of the whole, the applied ornament is so in many cases, having been easily acquired off some unsaleable ecclesiastical relic. In a cup, the general structure is usually built up out of some small vessel, unimportant in value, but possessing the necessary quality of old hammered silver; after being altered to the desired form, the requisite engraving and decoration are skilfully executed, portions of applied ornament are added, enamelled armorial bearings are introduced and partly obliterated, the whole is gilt after a recipe of the Monk Theophilus, and finally the finished article is either buried in the earth or subjected to certain acids which quickly oxidise and eat away portions of the surface. After clever manipulation the piece has all the appearance of great age; it is then given a bogus pedigree, in which a Duke of Burgundy and a Spanish convent generally figure, and all is ready for the unsuspecting purchaser into whose hands it passes at a very high price and with a great deal of involved mystery. Some of these forgeries are exceedingly beautiful, and prove that the man who made them is capable of executing the finest metalwork, but the exceptionally high prices he can obtain for them as antiques offer too much temptation for him to acknowledge them as merely copies and his own work of the present time."

In the *National Review* Mr. F. Inigo Thomas writes a short article "On Gardens," which is mainly a brief *résumé* of the view of the subject usually taken of late years by those who look at the garden from the artistic point of view. Mr. Thomas mentions, among other things, the deficient sense of proportion nowadays as to the comparative outlay on house and garden. In old days, a man who spent 10,000*l.* on a house would hardly count on the garden costing less than half that amount. In the present day an expenditure of 500*l.* on a garden for a house on that scale would be unusual.

The *Westminster Review* contains an article by Mr. H. Seal, "A Hint to Ictinus," an extraordinary compound of egotism and absurdity, the main thesis of which is that the world is tired, or ought to be, of architecture dealing with level floors and vertical lines, and that he, Mr. Seal, is prepared to carry out a new style in which all the lines shall be irregular and the floors in hills and vales, &c., for the attainment of the true picturesque of architecture. It is a really remarkable example of the kind of rubbish on architectural subjects which literary editors will admit into a magazine.

Scribner contains a long article, most interesting and valuable at the present moment, on "The Proposed Isthmian Ship Canal," by Mr. W. H. Burr, a member of the Isthmian Canal Commission; illustrated by numerous views of places on the two rival routes, a map, and sectional diagrams of the two proposed canals. It is perhaps the first time that full information on the subject has been brought before the general public in an authoritative form. As a member of the Commission, Mr. Burr is of course not concerned with recommending (publicly at least) either route; he merely gives the facts, and at the close of the article an impartial summary of the considerations for and against each route, which is of so much interest that we have reprinted it in full on another page. The same issue contains an article on "Washington—A City of Pictures," in which we cannot help thinking that the pictorial and architectural effect claimed for Washington is somewhat exaggerated by means of the style of execution of the illustrations, in which all details are softened off into a kind of hazy effect which lends enchantment to the views. Many things look picturesque in a mist which do not look so in a strong light. However, the illustrations, whether flattering or not, are at all events very picturesque in themselves. In the same issue is a short article on the work of a Russian sculptor Paul Troubetzkoy, one of the most gifted and powerful of the naturalistic school of sculptors, and who in this sense bids fair to rival Dalou; only the French sculptor is not a naturalist alone; that is only one of his sides. Troubetzkoy's mother, it appears, was an American, and he received his artistic education in Italy; but he may nevertheless be called a Russian sculptor; his style is decisively northern and by no means Italian.

Harper contains a reprint of Goldsmith's "Deserted Village" with a critical commentary from the very competent pen of Mr. Austin Dobson, and a series of new illustrations by Mr. Abbey; the latter seem to us more marked by a realistic cleverness than by a sentiment in keeping with that of the poem, except the one of—

"The decent church that topp'd the neighbouring hill,"

which is a fine bit of landscape effect. "Rapallo and the Italian Riviera" is an article on the picturesque architectural elements of the neighbourhood described, with some very good little sketches by the author. "Man and the Upper Atmosphere" is a short article by Dr. R. Süring, of the Meteorological Institute, Berlin, giving a summary as to what is known or has been experienced in regard to the possible heights in the atmosphere to which man may safely ascend; an article obviously written with a view to the possible further development of ballooning. An article on "Belgium's Art Crusade," by Mr. C. Mulford Robinson, should be of some interest to our readers; it relates to the history and achievements, so far, of the "L'Œuvre Nationale Belge," a society formed a few years ago in Brussels with the object of promoting picturesqueness and beauty in city architecture and decoration in the Belgian capital. The "L'Œuvre" has instituted competitions for the best designs for street houses, street signs, &c., &c. How far the Society obtains official support we do not quite gather; but it appears to have made itself more or less an artistic influence. Might not some such institution be tried in London?

The *Century* contains an article on "The Building of a Cathedral," by Mr. Roger Riordan, which is concerned with the New York Cathedral, in progress from the designs of Messrs. Heins and La Farge, but which has as yet only been carried so far as to

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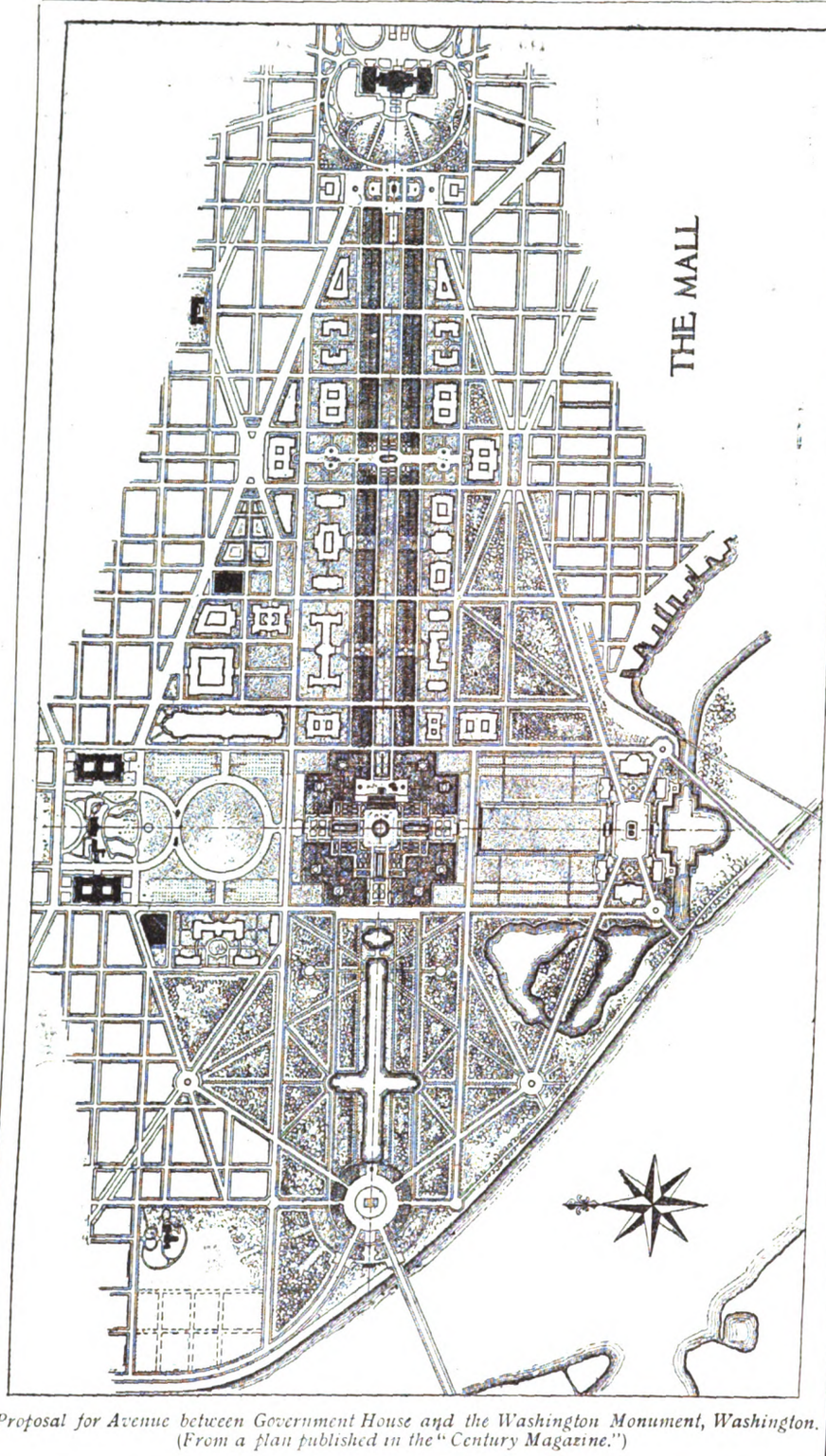

Proposal for Avenue between Government House and the Washington Monument, Washington. (From a plan published in the "Century Magazine.")

permit of service being held in the crypt. The view of the structural or engineering portion of one of the four great arches intended to carry the tower, as it now stands with the scaffolding around it, is impressive, and reminds one of the old plates of St. Peter's in progress. No plan is given. The illustrations of the exterior and interior as contemplated show that the exterior will be a massive and striking example of revived Gothic, with an immense central tower, sixteen-sided on plan, though it produces the general effect of being square, owing to the accentuation of four of the angles by turrets. The view of the interior of the choir is not by any means satisfactory. It is an imitative Romanesque round arched style, mixed up with florid details suggesting later Gothic, and out of keeping with the general design. It is not an originality of much value which is attained by mixing up imitative details belonging to different epochs of Mediæval Gothic. The scale of the build ng will make it impressive, but we think it will be a pretentious building, and not such as to satisfy the world's maturer judgment. The bases of the interior walls, we are told, will be faced with polished red jasper, above which will be a deep moulding of dark green serpentine. The rest of the interior will be of a light buff limestone from Frontenac (Minnesota), said to be rather like Caen stone, but harder. No prediction is made as to its probable date of completion. The article which follows it, on "The Uses of a Cathedral," by the Bishop of New York, should be read in connexion with the subject; it is a beautifully written plea in favour of the spiritual value of a great cathedral, even for those who differ intellectually from the faith for which it was erected. In the same number are two short articles on the proposed improvement in the laying out of Washington architecturally, by Mr. D. H. Burnham, a member of the Washington Improvement Commission, and Mr. Charles Moore. From a plan given, the leading idea is apparently to form an immense decorative or State avenue from the Washington Monument to the Capitol. This was an old idea, but unfortunately the builders of the Washington Monument, owing to some difficulty about the foundations, placed the Monument out of axis with the Capitol, and the intervening avenue (called the Mall) has since been partially intruded upon by railway tracks. The present scheme is to clear this ground, lay it out in ornamental gardens, and to correct the mistake as to axis by laying out a new and narrower avenue—an avenue within an avenue, so to speak, on a line slightly oblique to the outer boundary lines of the Mall, and axial with the Capitol and the Monument. Both will of course be a little out of square with the avenue, but not so as to be noticeable. The ornamental parterres on each side of the new avenue will also be out of square, and will be wider on one side than on the other; but they cannot be seen together except on a plan, and judicious laying out can mask the irregularity of line in the separate parterres. Beyond the Monument will be a long canal with transept branches, continuing the axial line. We give a reproduction of the plan as given in the *Century*. It is a fine and a cleverly conceived scheme.

The *Revue Générale* opens with an article on the interesting and rather new subject "L'Industrie dans la Grèce Ancienne," a review of what is described as a very important book on that subject by M. Francotte, who has devoted many years to the study of the subject, which has led him to the conclusion that though the Greeks had what are now called "industries," their influence on the social life of the country was very slight. The three principal industries of ancient Greece the author considers to have been metallurgy, ceramics, and wool-working, and that the principal centres of industry were Athens, Corinth, and Delos; but that the wealth of the country depended rather on commerce than industry. The *Revue*, however, has done service in calling to what appears to be a valuable and interesting book.

The *Gentleman's Magazine* contains an article by Mr. John Stafford, "On Senlac Hill," which is an attempt to realise, on the ground, the progress and events of the battle, so momentous for this country, in which William conquered Harold. The article is well written and of considerable interest.

Among articles in *Knowledge* is a brief history of the development of Fahrenheit's Thermometer, by Sir Samuel Wilks. An article on "The Use of Hand Telescopes in Astronomy" may be of practical interest to those who wish to observe the stars and cannot afford a mounted equatorial.

The quarterly *Journal of the Sanitary Institute* contains the papers read at the conference on Water Supply and River Pollution, with the important discussions which took place on the subject.

THE ARCHITECTURAL ASSOCIATION: DISCUSSION SECTION.

THE eighth meeting of the Discussion Section of the Architectural Association for this session was held at 56, Great Marlborough-street, W., on the 7th inst. Mr. R. H. Weymouth was in the chair, and a technical paper on "Stained Glass" was read by Mr. J. Dudley Forsyth, which is printed in full on another page. There were illustrations of Mr. Forsyth's own work, and not the least interesting part was that devoted to demonstrations in "staining" and "leading."

The discussion was opened by Mr. W. E. Davis, who proposed that the best thanks of the meeting be given to Mr. Forsyth for his kindness in preparing such an excellent paper. He agreed with the author that it was absolutely essential for the production of a harmonious work that the artist should study the surroundings before making his design.

The vote of thanks was seconded by Mr. F. C. Eden, who said he had listened with great pleasure to the most instructive paper Mr. Forsyth had prepared.

Mr. Prest followed, and said it was a great pleasure to him to have been present and heard Mr. Forsyth's paper, from which he had learnt many things. He was quite in accord with the author as to the necessity of studying the surroundings of one's work. He did not agree with some of the speakers in their condemnation of canopy work, as he thought it was valuable when properly used, especially in Perpendicular work. He thought it very interesting to have to fill in the most intricate traceries of windows. He was pleased

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to see in Mr. Forsyth's designs the introduction of scrolls and good black lettering.

Mr. H. H. Statham said he thought the art suffered from realism and the use of perspective, and on the latter account objected to canopy work, unless treated entirely *en silhouette*, as well as to pedestals and floors in perspective. The effect of colour rather than figure drawing should be the aim of the artist in stained glass, and symbolism rather than realism.

Mr. Tucker thought the early methods of working in stained glass were the right ones, and was sorry to hear the "new art"—as it had been described—so adversely criticised. He thought they could not do better than follow the idea exemplified in the working of a good church banner, and that the flesh tints should be lightly touched in. He quite agreed that the effects in Westminster Abbey were most distressing.

Mr. Booer said in the old days the glass was full of imperfections, but since the establishment of Hartley's works at Sunderland, which were largely influenced by A. W. Pugin, we are now able to obtain the most perfect material. The varying thicknesses of the glass was part of its beauty. He called attention to the first use of bottled glass in Mr. Prior's church at Framlingham. He thought we ought not to use the American opalescent glass, as it was unsuited to our climate. It was most interesting to work out a design by using small pieces of stained glass and gumming them on a sheet of paper.

The Chairman said they had all listened with great pleasure to Mr. Forsyth's paper. He thought it most essential that the stained-glass artist should have a good eye for colour. It was the duty of architects to design good buildings, and to give the stained-glass worker a free hand with the windows. He thought they handicapped their work by taking it up from a business point of view.

The Chairman then called upon Mr. Lewis F. Day, the Special Visitor of the evening. Mr. Day said he thought they were deeply indebted to Mr. Forsyth for the extremely interesting paper, and he had much pleasure in being present. He thought plating and enamelling should be used with great discretion, and the use of aciding tended to fritter away the design. The use of soft flux was the cause of bad work, which was the fault of some of Morris's work. With regard to the scale of the figures, he thought the body should be lengthened so as to correct the effect of foreshortening. He strongly objected to the figure fetich and the use of canopy work, the latter always suggesting cheapness to his mind. Stained glass was a barbaric art, and by the introduction of figure work the art was ruined. The story of a window had no influence on him; he only admired the beauty and glory of the colour. He quite agreed as to the necessity of studying the style of the building, and thought it inartistic not to do so.

The vote of thanks was made to include the Special Visitor, and, having been put to the meeting, was carried with acclamation.

Mr. Forsyth having replied, the meeting terminated.

It was announced that the next meeting would be held on Friday, February 21, when Mr. F. C. Eden will read a paper on: "The Organ: Its Proper Position and Architectural Treatment."

THE PANAMA AND NICARAGUA CANAL ROUTES.

UNDER the head of "Magazines and Reviews" we have referred, on another page, to the remarkable article on "The Proposed Isthmian Ship Canal" in *Scribner's Magazine*, written by Mr. W. H. Burr, a member of the Isthmian Canal Commission. The following is his impartial summary, at the close of the article, of the heads of the case for and against each of the alternative routes. The question of the canal is one, we need hardly observe, of interest to the whole civilised world:—

"Concisely stating the situation, its main features may be expressed somewhat as follows:—

Both routes are entirely 'practicable and feasible.'

Neither route has any material commercial advantage over the other as to time, although the distance between our Atlantic (including Gulf) and Pacific ports is less by the Nicaragua route.

The Panama route is about one-fourth the length of that in Nicaragua; it has less locks, less elevation of summit-level, and far less curvature, all contributing to correspondingly decreased risks peculiar to the passage through a canal. The estimated annual cost of operation and maintenance of the Panama route is but six-tenths that for the Nicaragua route.

The harbour features may be made adequate for all the needs of a canal by either route, with such little preponderance of advantage as may exist in favour of the Panama crossing.

The Commission estimated ten years for the completion of the Panama Canal and eight years for the Nicaragua waterway, but the writer believes that these relations should be exchanged, or at least that the time of completion for the Panama route should not be estimated greater than for the Nicaragua.

The water supply is practically unlimited on both routes, but the controlling or regulating works, being automatic, are much simpler and more easily operated and maintained on the Panama route.

The Nicaragua route is practically uninhabited, and consequently practically no sickness exists there. On the Panama route, on the contrary, there is a considerable population extending along the entire line, among which yellow-fever and other tropical diseases are probably always found. Initial sanitary works of much larger magnitude would be required on the Panama route than on the Nicaragua, although probably as rigorous sanitary measures would be required during the construction of the canal on one route as on the other.

The railroad on the Panama route and other facilities offered by a considerable existing population render the beginning of work and the housing and organisation of the requisite labour force less difficult and more prompt than on the Nicaragua route.

The greater amount of work on the Nicaragua route, and its distribution over a far greater length of line, involve the employment of a correspondingly greater force of labourers for an equally prompt completion of the work.

The relative seismic conditions of the two routes cannot be quantitatively stated with accuracy, but in neither case are they of sufficient gravity to cause anxiety as to the effects upon completed canal structures.

Concessions and treaties require to be secured and negotiated for the construction of the canal on either route, but the Nicaragua route only is free from the complications of prior rights and concessions.

In view of the unreasonably high price put upon their rights and property by the New Panama Canal Company the Nicaragua route must be taken as the most 'practicable and feasible' for the construction of a ship canal by the United States Government. This decision may ultimately be affected by further negotiations or by the reasonableness of terms under which concessions may be secured or treaties negotiated with the respective Central American governments, and the promptness with which these ends may be attained."

COMPETITIONS.

ART SCHOOL, HULL.—In the recent competition for a new art school at Hull the first premiated design was that sent in by Messrs. Lanchester, Stewart, and Rickards, Vernon-place, Bloomsbury-square, London, W.C. The second premiated design was that by Messrs. Spencer W. Grant and James A. Bowden, Finsbury-pavement, London, E.C.; and the third by Mr. Francis J. Smith, Parliament Mansions, Victoria-street, Westminster, London, S.W.

SCHOOLS, HORNSEY.—In the limited competition for the new Mattison-road Schools, for the Hornsey School Board, Mr. Robson, the assessor, placed first the joint design of Mr. Arnold Mitchell and Mr. Alfred Butler. The second premium was awarded to Messrs. Hall, Cooper, & Davis, and the third premium to Mr. G. E. T. Laurance. Messrs. Mitchell & Butler have been appointed architects to the new buildings, and the work is to be proceeded with at once. The school is of exceptional importance, comprising four large blocks. In addition to the ordinary elementary school buildings, there will be a higher grade school with lecture-room — art and science class rooms, physical and chemical laboratories; also a manual instruction room, cookery and laundry rooms, housewifery rooms, and a swimming-bath.

TRADES COUNCIL BUILDINGS, LEEDS.—The new buildings of the Leeds Trades Council, in Upper Fountaine-street, are now approaching completion. The buildings, which are being erected by the Leeds Builders Company, according to the designs of Mr. W. S. Braithwaite, architect, comprise a hall capable of accommodating 450 people, a smoke-room and bar, with a billiard-room (two tables), reading-room, lodgerooms, and offices. The new buildings, which are constructed of brick with stone dressings, will cost some 6,000*l*. They are to serve the purposes of a club.

ARCHITECTURAL SOCIETIES.

NOTTINGHAM ARCHITECTURAL SOCIETY.—At the Victoria Station Hotel on the 6th inst. the annual dinner of the Nottingham Architectural Society was held. Mr. A. Marshall (President) was in the chair, and Mr. A. W. Brewill (Vice-president) in the vice-chair. The loyal toasts having been honoured, Mr. R. Evans, J.P., gave the "Health of the Mayor, the Sheriff, and the Corporation of Nottingham." He said the architectural profession had many transactions with the Corporation, and it was impossible to say how much they owed to the goodwill and influence of the Mayor and Sheriff. Mr. Evans then paid a tribute to the excellent manner in which the Corporation officials did their work. The Mayor (Councillor E. N. Elborne, J.P.), in his reply, said he was pleased to see that the architects worked well with the Corporation officials, whose duties were sometimes onerous. He hoped that before long the architects would be strictly entitled to call themselves a profession. He often wondered what standard of knowledge entitled a man to be called an architect. He thought all architects should go through a proper period of training, because, if it perhaps would not make an architect, it would be a sort of guarantee that they were qualified for the positions they held. He congratulated the architects of Nottingham on the great strides they were making in the character of the buildings they were putting up in Nottingham. Concluding, he said the architects could do a great deal towards solving the problem of the housing of the poor by providing some practical scheme. The Sheriff (Councillor E. G. Loverseed) also briefly responded. He hoped that when the Corporation took up schemes for the improvement of the city they would try to get uniformity of design. "The Master Builders' Association" was proposed by Mr. A. N. Bromley, who said there would always be in a profession like theirs men who were not really architects. While such a state of affairs existed their profession would always be open to disparaging remarks, which, however, he did not think were shared by the general public. So far as the builders of Nottingham were concerned, the architects had the greatest respect for them. A good builder was an architect's greatest comfort. Referring to the prices for work which prevailed in America and England, he said the master builders should inquire into the extraordinary difference that existed. Mr. H. Vickers (President of the Nottingham Master Builders' Association) replied. He said their Association was doing good work, and so long as they conducted it on the lines laid down there was no reason to fear but that it would be a benefit, not only to them but to the architects. Mr. A. E. Heazell proposed the toast of "The Visitors," and Dr. Boobbyer replied. The "Health of the President of the Society" was proposed by Mr. H. Walker, and the President, Mr. Marshall, responded.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting on the 5th inst., Mr. Thomas Blashill, Vice-President, in the chair, Mrs. Astley exhibited a very elegant glass goblet of Venetian manufacture, in perfect condition, believed to be of the fourteenth century; and the Rev. H. J. Dukinfield Astley two snuffboxes, one of silver, the other of copper, the lids having figure subjects in high relief, Flemish in character, probably of late seventeenth century date. Mr. Patrick submitted for exhibition, on behalf of Mr. Sanders, of Bristol, an article called a "riff," an instrument for sharpening the scythe, made of cross-grained oak, grated on each side, and powdered with a coarse grit sand, very hard. It is an interesting survival of an ancient type still in use at the present day in the district of Glamorgan, which was once the domain of the "Kings of Gower." The grit stone sand is found in the neighbouring hills, but those who know where to find it keep the deposits a secret, and when a sufficient supply has been obtained the place is covered up. The Chairman remarked that a somewhat similar instrument, but differing in shape, is still used in Yorkshire, but is there called a "strikel." – Dr. W. de Gray Birch gave some particulars of the little-known, but one of the finest specimens of a, fortified ecclesiastical building in Great Britain, "Gwnny Priory, Glamorgan," the history of which is so well given in the valuable work just published by Colonel Turbervill.

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ROYAL ARCHÆOLOGICAL INSTITUTE.—At the General Meeting on Wednesday, the 5th inst., Judge Baylis, K.C., in the chair, Viscount Dillon read a paper on "Horse Armour," in which, after describing the various parts of the protection for the animal, he noted several instances in which such protections made of metal or of cuir bouilli were mentioned in memoirs, wills, &c. The chief examples of existing armour of this class in our own and foreign collections were described, and the nomenclature of the different parts in French, German, Italian, and Spanish was given. The existence of a portion of cuir bouilli horse armour in the Tower of London, and the artistic treatment of various metal horse armours in Europe, notably that of the Elector Christian II., at Dresden, were referred to. The fact of the Shoshones and Comanche Indians having used leather horse armour was also noticed.—Mr. J. H. Round then read a paper on "Castle Guard," in which he claimed that, although one of the earliest of feudal burdens, its commutation for a money payment had enabled it to survive the abolition of feudal tenures, and to continue till recent times. He suggested that the rate at which it was commuted afforded an indication of the date at which the commutation was effected, and he dealt with the system on which the guards of the chief royal castles were originally provided for, laying stress on the great distance from the castle at which the manor owing guard service often lay. He then dwelt on the value of castle guard tenure as an instrument of research in local history, pointing out that it enabled one, at times, to trace the history of a manor from the Conquest and to prove identities otherwise obscure. Sir Henry Howorth, Mr. Green, Mr. St. John Hope, and Mr. Oswald Barron took part in the discussion.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—At a meeting of this Institution, held at the Westminster Palace Hotel on the 7th inst., the Chairman, Mr. Percival Marshall, presiding, a paper on "The Electric Passenger Elevator" was read by Mr. William J. Cooper. The principal requirements of an effective electric elevator were stated to be safety, reliability, effective control, economy, and compactness, and were divided into two clearly defined groups, having reference to (1) the winding machine, in operation while the elevator was in use with the safety devices, which were usually inactive, but had to come into play as soon as any portion of the hoisting apparatus failed or got out of order; (2) the car with its safety gear moving up and down the hoistway. The chief features of an ordinary gear were the armature of a motor coupled to a worm with ball or collar bearings to take the end thrust of the worm; a worm wheel submerged in an oil bath, and fixed in a suitable bracket, entirely protected from the action of dust or grit; a grooved winding drum or veed wheel fixed to the worm wheel or mounted on the same shaft. Such machines were almost exclusively operated on the over balance system. This had the advantage of economy of power by making the system balanced when the average load was in the car, in which case the elevator had no gravity work to perform, and resulted in the most economical type of hoisting apparatus. The electric motor and winding machinery could be erected either at the top or at the bottom of the hoistway as desired. If fixed at the top, one face of the drum could be plumb over the centre of the car, and the other face plumb over the counterbalance weight. Under special circumstances, the machinery might be placed at a distance from the hoistway, and the ropes guided over diverting sheaves, but it was obvious, however, that the fewer sheaves employed, the less would be the wear on the ropes and loss by friction. The arrangement of placing the machinery at the top of the hoistway was particularly adapted to the electric elevator, as the current was easily conveyed by the cables to the motor and controller. The author dwelt on the importance of an effective form of brake. It might be mechanically operated from the switch gear shaft by the controlling rope, or be an automatic magnetic solonoid brake, the type now generally adopted. A solonoid and magnet of small dimensions could be made to give a pull of 500 lbs. to 600 lbs. through one half inch. To meet the severe demands of the elevator, motors of a somewhat distinct classhad been introduced, constructed so as to need little attention. A comparatively small motor could be used, as in all cases the maximum load was of short duration, the motor standing idle for at least half the time. Shunt motors were self-regulating if the potential was constant, and were now almost invariably adopted, but with about 10 per cent. of series winding added on the field magnets to enable the motor to develop a powerful torque at the moment of starting. Considerable ingenuity had been expended over the starting and controlling switches, the operation of which might be effected in various ways, either by a hand rope, a hand wheel, a lever, or by a push-button device. The controller had to perform three general functions:—1. Make and break the current for motor, and reverse the armature circuits. 2. Cut out the starting resistance automatically, and with fixed steps. 3. Cut in the resistance for stopping, and apply the brake. The push-button controller was to be recommended for private houses, or places where an attendant was not required, the elevator being operated by the passenger. The machine was of the ordinary drum type, the controlling being entirely electric and operated by simply pushing a button. Various automatic safety devices were used in connexion with the working controller or push-button switches. These devices were operated by both the car and the hoisting machine, to cut off the power and apply the brakes at the limits of the car's travel. The safety apparatus and the bottom guide shoes were attached to the bottom of the car, which was surrounded by the girdle irons, or a steel channel crown bar of special section for lightness, securely connected to the under frame by side bolts fitted with adjustable guides of gun metal or cast-iron, and movable guide sheaves for the hoisting ropes to pass over to the bottom of the car to prevent undue wear. To guard against the car falling unretarded to the bottom of the hoistway, in the event of the hoisting ropes breaking or becoming unshipped, there were several types of safety gears employed, attached to the bottom or platform of the car, and arranged to operate by gripping the fixed guide posts or backings, either by the action of the compressed springs or levers, or by the combination of springs and centrifugal governor. Reference was made to accidents arising from the insecurity of entrances to the hoistway. An electrical locking apparatus should be fitted to all electric elevators, by which all the hoistway doors or gates would remain locked except when the car itself was in position at the landing, and stationary. The opening of any door was arranged to break the main circuit of the motor, and it was impossible for the motor to be started again until the gate was shut and locked and the circuit remade. It was shown that electric elevators of the type described were safe, reliable, easily controlled, and noiseless, while economy was claimed in cost of maintenance and power used. In most towns and cities the cost of electrical energy for power purposes was between 2d. and 4d. per B.O.T. unit. The first cost in many cases compared very favourably with that of hydraulic or other elevators. The electric elevator was adapted to standardisation. The whole of the hoisting gear could be kept in stock, and ready for assembling when an order was received, and the voltage, speed of travel, and load known. The length of the travel did not enter into consideration so far as the driving gear was concerned, the motor having simply to run somewhat longer, and the increased length of travel was thereby attained. In conclusion, the author pointed out that the power or current used in an electric elevator was in direct proportion to the number of persons or load carried, while, with one worked hydraulically, it was necessary to fill the cylinder with power water whether the load was light or heavy.—A discussion followed the reading of the paper, and a vote of thanks having been passed to the author, the proceedings closed with the announcement of the ensuing visit on February 22 to the new baths and wash-houses at Fulham, and of the next meeting on March 7, when a paper on "The Use of Engineering Models" would be read by Mr. Percival Marshall.

THE STUDENT'S COLUMN.—Our Student's Column article this week is unavoidably held over.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Camberwell Borough Council 3,000*l.* for various purposes; St. Pancras Borough Council 500*l.* for street improvement; and Westminster City Council 2,37*l.* for street improvement.

The Works Department.—Mr. Austin asked the Chairman of the Finance Committee whether an offer had been before the Committee to carry out the jobbing work of the Council at 18½ per cent. below the Council's schedule.

Lord Welby said the question had been raised as to whether such an offer would be entertained, but he was unable to say that the offer was actually before them. There was a question raised that the War Office Contractor should undertake the work.

Mr. Burns, M.P., asked whether in the event of such an offer being made the committee would take steps to inquire whether the offer was a *bonâ-fide* one, and if loss was being guaranteed against, from a pool, by the contractors who wanted to break up the Works Department.

Lord Welby said full investigation would be made.

Cost of Brickwork.—The Finance Committee submitted the following report:—

"An article appeared in the *Times* newspaper of November 18, 1901, on 'The Crisis in British Industry,' and the effect of trade unionism on the trade of the country. In the course of his article the writer referred to the output of bricklayers employed on the construction of works by or for the Council. He said—'The *maximum* of 400 bricks per day is the "recognised" limit for dwelling-houses, shops, and business premises built by a private contractor. In the case of public buildings, and especially London County Council and London School Board work, the limit is considerably less.' He added that certain bricklayers had stated that 'The London County Council limit is 330 bricks the day. That is what they consider a fair day's work.'

If this passage means that the Council has accepted 330 bricks as a fair day's work, that statement is not correct. The manager of works, who is responsible for the execution of works entrusted to the department, assures us that he has never recognised any such limit, and such a suggestion has received no countenance from us.

We have made careful inquiries as to the accuracy of the statements which we have quoted, and we have been furnished with the opinion of several London firms of contractors as to the present and past output of bricklayers employed by them. There is a difference of opinion as to the number of bricks actually laid, but we find a general agreement that the number laid per man per day is considerably less than the corresponding number laid from twelve to fifteen years ago, though it has risen somewhat from the number laid two or three years ago.

The officers of the Council whom we have examined are not altogether agreed as to whether the number of bricks laid by men employed in the Works Department is equal to the number laid by bricklayers employed by contractors. Although we have given the matter our careful attention, the difficulty of obtaining accurate and comparable data has prevented us from arriving at any definite conclusion upon the point.

We have not been able to obtain detailed information with respect to any of the large works completed by the Department, owing to the absence of any details as to the actual cost to the Department of brickwork. We have, however, obtained from the manager of works a rough calculation of the rate on three works recently executed or in course of execution by the Works Department—viz., Perry-vale Fire Station, Battersea-bridge Dwellings, and Seymour and Somerset Buildings. The manager arrives at his results by dividing the total number of rods of brickwork by the number of hours returned as worked in laying the bricks. We conclude from the figures that, taking into account every class of brickwork found in buildings of the above character, the figure of 330 bricks per man per day is considerably below the number actually laid."

Works Manager.—The General Purposes Committee reported as follows:—

"We have had under consideration the arrangements to be made consequent on the retirement of Mr. Adams, the manager of works, and have now decided to recommend the Council to order the issue of an advertisement inviting applications for the position at the salary which at present attaches to the appointment, viz., 1,500*l.* a year. We have also come to the conclusion that in future the supervision of the department should be entrusted

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to a Works Committee with a membership of seven, in addition to *ex-officio* members; and we propose in due course to submit for the Council's consideration a draft order of reference. In the meantime we recommend—(*a*) That an advertisement be issued inviting applications for the appointment of manager of works, and that the salary to be attached to the position be 1,500*l.* a year as at present. (*b*) That a Standing Committee, consisting of seven members, be appointed for the supervision of the Works Department, and that such committee be styled the Works Committee."

The consideration of the matter was adjourned. An amendment is to be moved to the effect that the salary shall be 1,000*l.*

The Water Question.—A debate on the new Government measure for dealing with the water question lasted for more than four hours. The Water Committee submitted a long report, which concluded with the following recommendations :—

(*a*) That the interests of the people of London in the acquisition and administration of the water supply are so vital that they ought not to be entrusted to a Water Board nominated by seventy-eight different authorities and independent of public control.

(*b*) That it is inexpedient and dangerous that a Board constituted as proposed should have the power to decide by agreement what sum shall be paid to the Companies, or that it should have the right of creating debt or of levying rates upon London.

(*c*) That the Council should endeavour to obtain such amendment of the financial provisions of the London Water Bill, 1902, as shall make it clear that the award of the arbitration tribunal is to represent the fair and reasonable value of the undertaking and is to be determined as a sum of money.

(*d*) That the Parliamentary Committee be instructed to prepare and present a petition against the Bill, and that the seal of the Council be affixed to such petition.

Mr. Henry Clarke moved as an amendment, "That the Council welcomes the introduction into the House of Commons of the Government Water Bill, as affording a reasonable basis for the settlement of a difficult question."

The amendment was lost, and the recommendations of the committee were agreed to by large majorities.

Tenders.—The following tenders were accepted :—

Supply and erection of light ornamental fencing to enclose shrubberies at Horniman Gardens—Hill & Smith, 117*l.* 8*s.* 6*d.*

Wiring, &c., in connexion with the installation of the electric light at the Smack Boys' Home, Lowestoft—Bush & Dryburgh, 103*l.*

The Council adjourned at 7.30 p.m.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Erection of One-story Shops in Victoria-street, Westminster.

Westminster.—That the Council's resolution of November 19, 1901, sanctioning the erection of one-story shops and an entrance porch in front of Nos. 123, 125, and 127, and Nos. 145 to 169 (odd numbers only, inclusive) Victoria-street, Westminster, be rescinded. That the Council do consent to the erection of one-story shops and an entrance porch in front of a portion of No. 125, Victoria-street, Westminster (Messrs. Z. King & Son for Mrs. M. Hiscox, Mr. J. T. Hiscox, and Mr. R. T. Raikes).—Agreed.

Lines of Frontage.

Marylebone, East.—Buildings on the south-west side of Park-road, Regent's Park (Mr. H. O. Cresswell for the trustees of the Eyre estate).—Consent.

Islington, North.—An addition to No. 58, Yerbury-road, Upper Holloway, to abut upon Wedmore-street (Mr. G. Saint for Mr. G. Welch).—Refused.

Width of Way and Space at Rear.

Westminster.—Certain deviations from the plan certified by the District Surveyor under Sections 13 and 43 of the Act, so far as relates to the proposed rebuilding of the stable at the rear of No. 29, Great Chapel-street, Westminster, abutting on Dacre-street (Messrs. Blyth & Co. for Mr. A. Craddock).—Consent.

Space at Rear.

Holborn.—A building on the site of No. 17, Hunter-street, and No. 21, Compton-street, Brunswick-square, with a portion of the building, not to exceed 30 ft. in height, on part of the open space required by Section 41 of the Act to be provided at the rear of the building (Mr. J. G. Izard for Mr. J. Wyman).—Consent.

Artisans' Dwellings.

Islington, North.†—That the Council do make an order as follows :—Whereas Mr. R. Robertson, on January 11, 1902, under the provisions of Section 42 of the London Building Act, 1894, delivered, on behalf of the Housing of the Working Classes Committee of the Council, at the County Hall, plans of blocks of intended dwelling-houses, to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site on the western side of Wedmore-street, Islington, southward of Wedmore-mews. . . . . Now the Council does by this order sanction the said plans so far as Section 42 of the said Act is concerned. . . . .—Agreed.

Hackney, North.—That the Council do make an order as follows :—Whereas Mr. C. Gordon Smith, of No. 56, Cannon-street, E.C., on January 23, 1902, under the provisions of Section 42 of the London Building Act, 1894, delivered on behalf of Messrs. Michell, Goodman, Young, & Co., Ltd., at the County Hall, plans of intended dwelling-houses to inhabited by persons of the working class and proposed to be erected, not abutting upon a street, on a site to the eastward of the mission-hall, on the north side of Stamford-terrace, Hackney. . . . . Now the Council does by this order disapprove of, and refuse to sanction, the said plans.—Agreed.

Width of Way and Projection.

Strand.†—The retention of a stone balcony, with an iron railing, at the second floor level in front of No. 39, Wardour-street, Soho (Mr. W. Hoe).—Consent.

Means of Escape from Top of High Buildings.

St. George, Hanover-square.—Means of escape in case of fire proposed to be provided in pursuance of section 63 of the London Building Act, 1894, on the top story of the northern portion of a block of residential flats on the west side of Harewood-place, abutting on Oxford-street, St. George, Hanover-square (the upper surface of the floor of which story is above 60 ft. from the street level), for the persons dwelling or employed therein (Mr. P. Hoffman for Mr. H. Lovatt).—Consent.

*** *The recommendations marked † are contrary to the views of the local authorities.*

BOOKS RECEIVED.

HISTORICAL INTRODUCTION TO THE COLLECTION OF ILLUMINATED LETTERS AND MANUSCRIPTS in the National Art Library. By John W. Bradley, B.A. (Eyre & Spottiswoode. 2*s.* 6*d.*)

APPLIED PERSPECTIVE FOR ARCHITECTS AND PAINTERS. By W. P. P. Longfellow. (Houghton, Mifflin & Co., Boston, U.S.A. 13*s.* 6*d.*)

LAXTON'S BUILDERS' PRICE-BOOK FOR 1902. (Kelly's Directories, Ltd.; and Simpkin, Marshall & Co.)

A HISTORY OF THE CHURCH OF ALL SAINTS, NORTHAMPTON. By the Rev. R. M. Serjeantson, M.A. (William Mark, Northampton.)

BERMONDSEY: ITS HISTORIC MEMORIES AND ASSOCIATIONS. By Edward T. Clarke. (Elliot Stock.)

A HISTORY OF DESIGN IN MURAL PAINTING. By N. H. J. Westlake, F.S.A. (J. Parker.)

DAWLISH, AND THE ESTUARY OF THE EXE ("Homeland Handbooks" Series). By Beatrix F. Cresswell. (Homeland Association.)

Correspondence.

COMPETITION DRAWINGS.

SIR,—Mr. Foxley, writing in reply to my letter on this subject, says that elaborate drawings are made to appeal to the *promoters* rather than the Assessor in a competition. That may be so, but is it not shortsighted policy—quite apart from the question of its morality? After all, is it not a fact that supersession of an assessor's award is rather the exception than the rule (I fear, by the way, that some of the exceptions have been rather notable)? But, even were it not so, do elaborate designs necessarily appeal to a Committee of laymen? My own experience is to the contrary.

As a rule, laymen find it difficult to grasp even the main lines of a plan, and they are liable to "shy" at section and dimension lines, dotted girders, pipes, &c. They are more at home with the elevations, and may be easily led away by mere trickery and elaboration; but many are alive to their own fallibility in this respect, and others suspect "expense" in elaboration.

ASSESSOR.

COST OF COMPETITIONS TO ARCHITECTS.

SIR,—One is sometimes inclined to speculate as to whether the public really know what large sums are spent by architects in connexion with competitions.

A recent paragraph in a paper in the North of England leads me to call attention to the subject. The paragraph in question stated that eighty-seven sets of designs had been sent in for a School of Art at Hull, and the cost of the building was expected to be about 12,000*l.* Presuming that "perspective views" were admitted, no one who knows the cost of getting up a set of competition drawings would be inclined to doubt that on an average the eighty-seven architects will have been committed to an expenditure out of pocket of something like 20*l.* each.* This means an actual outlay of 1,740*l.* coming out of the competitors' pockets, and as not one of the competitive drawings can be utilised as a working drawing, even the successful architect has to commence the real work *de novo*. A couple of years may probably elapse before a building of this sort is completed, and the architect's commission will amount to 600*l.* (5 per cent. on 12,000*l.*).

The present instance is by no means an uncommon one, and it is not easy, perhaps, to find a remedy; but I ask, Is there any other profession where competitors for work which will bring in 600*l.* to the successful man will spend upwards of 1,700*l.* among them? And this for the chance of one of them obtaining the work, spread over two years!

My object in writing is more to call attention to the general facts than to suggest a remedy, which is not an easy thing to do.

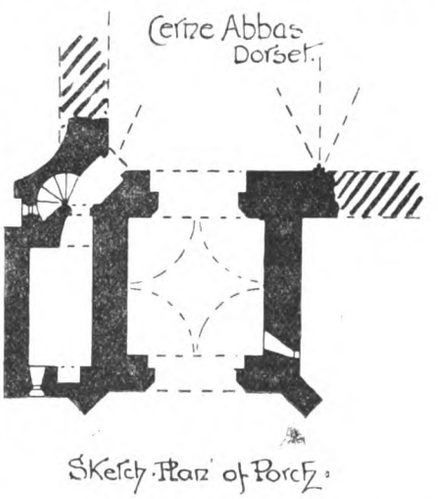
At the same time one is tempted to ask that when competitions are necessary, those responsible for them should endeavour to curtail the necessary outlay and expense as strictly as possible. Of course, for "public" work the public should always have the opportunity of inspecting what is submitted, and even this advertisement is sometimes denied to competitors, though I am glad to see that the Hull drawings will be on view. I may say that the writer is perfectly disinterested, and a

NON-COMPETITOR.

* We should think this was underestimated.—ED.

GATEWAY AND ORIEL, CERNE ABBAS.

SIR,—I see in your issue of to-day's date an interesting drawing of what the writer of the note calls "The Abbey Gate-house, Cerne Abbas." Had a proper plan accompanied the drawing it would be obvious to all that the building could not have been the abbey gateway. I enclose a sketch plan from



which it will be seen that it was a large three-storied porch to a lofty vaulted apartment, but what was the nature or use of the apartment it is impossible to say without excavation. The caps of the vaulting-shafts are at about the level of the second floor.

HAROLD BRAKSPEAR.

Illustrations.

DESIGN FOR A SWIMMING-BATH (SOANE MEDALLION).

WE have devoted our plates this week to a complete illustration of the design for a swimming-bath, treated in monumental style, by Mr. J. B. Fulton, for which the Council of the Institute of Architects this year awarded the Soane Medallion. We regard this as one of the best Soane Medallion designs for a good while past, and are desirous to do every justice to it.

We have commented on the design already in our review of the Institute Prize drawings in the issue of January 18. We have only to add here the following remarks by the author of the design :—

"After a great deal of serious thought on every conceivable scheme, I at last fixed on the one here illustrated, which appeared to me to meet the requirements of the competition.

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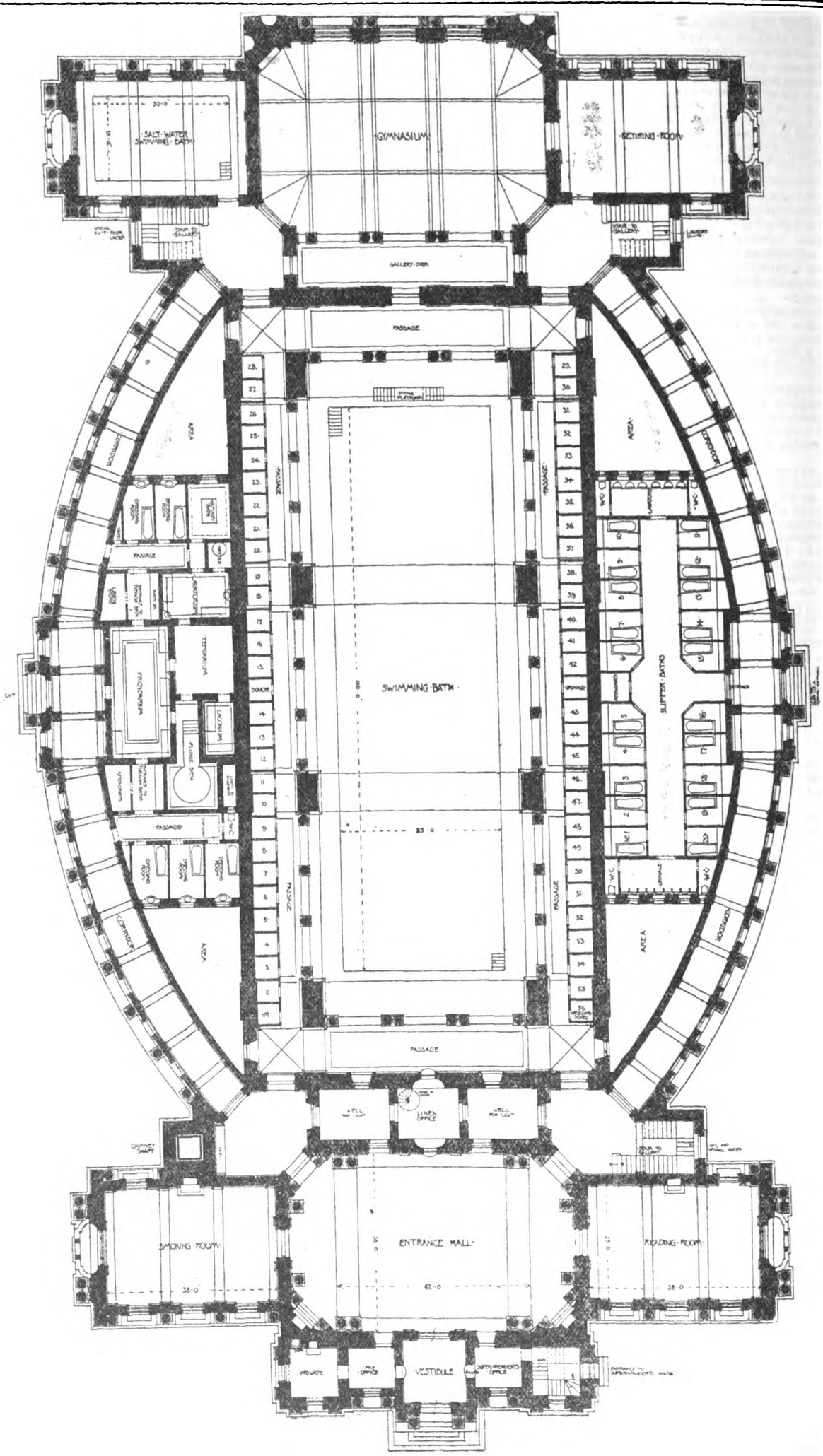
DEPARTMENT OF ARCHITECTURE,



GROUND FLOOR PLAN.

SCALE FEET

Design for a Swimming-bath (R.I.B.A. Soane Medallion, 1902). By Mr. J. B. Fulton. Plan.

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I have no doubt that top lighting is the more excellent method of lighting for a bath; but to treat the interior architecturally, as the conditions ask, I preferred it as shown, aiming at huge scale and dignified grandeur.

The exterior of the bath was by far the most difficult part of the design, because the large semicircular windows were so very difficult to treat externally in an architectural manner to be in style and scale with the rest of the building. I came to the conclusion that columns in front of the windows might do, giving fine perpendicular lines, and giving a certain character, aiming at originality, but not without precedent."

OBITUARY.

MR. PENTY.—Adverting to the decease of Mr. Walter Green Penty, of Lendal-chambers, York, announced in our columns last week, we may here add that he was elected a Fellow of the Royal Institute of British Architects in 1889, and was a Past-President of the York Architectural Society. Amongst the building works recently planned and designed by him we may cite the following:—The laundry buildings for the York Union; a dinner-hall for the York Board of Guardians; alterations and improvements of Elm Bank, near York, for Mr. Sidney Leetham; the Memorial Almshouses, Skelder-gate, York, opened in November, 1900; and the coal depot, with stabling, offices, &c., Clementhorpe, for the York Equitable Industrial Society, Limited.

MR. SIDNEY COOPER, R.A.—Mr. Sidney Cooper, the well-known animal painter, passed away a few days ago at his residence at Canterbury. The deceased was born at Canterbury on September 26, 1803, and at an early age he showed a love of drawing, his first known sketch being of the bell tower of Canterbury Cathedral. At the age of twelve he was engaged painting coaches for a coach-builder, which work he gave up for that of scene-painting. Through the influence of Sir T. Lawrence, he was subsequently admitted into the Royal Academy Schools. In 1827 he went to the Continent and settled at Brussels, where, becoming more prosperous, he married the daughter of an English resident. In 1831 he returned to England and settled in London. In 1833 he exhibited at the Suffolk-street Gallery, and in 1834 he first exhibited at the Royal Academy. At the Manchester Exhibition, he took the 20*l.* prize and the Heywood medal. From this time forward he became a regular contributor to the Academy, to which body he was elected an Associate in 1845 He did a number of works in collaboration with the late F. R. Lee, R.A., the landscape painter. In 1867 he was elected a Royal Academician. In 1882 he presented to the City of Canterbury the gallery of art which he had formed there, and in which for many years he had given gratuitous teaching to students, and the gallery was converted into a school and affiliated to the Science and Art Department of South Kensington. Last year he received the dignity of Commander of the Royal Victorian Order. He practically died in harness, being at work a month ago on pictures for the next R.A. Exhibition.

GENERAL BUILDING NEWS.

CONGREGATIONAL CHURCH, CARDIFF.—The new Central Congregational Church, Windsor-place, Cardiff, has just been opened. The new church has been erected at a total cost of 5,500*l.* Mr. W. Beddoe-Rees, Cardiff, was the architect.

NEW CHAPEL, CLYDACH, BRECONSHIRE.—The formal opening of Carmel Congregational Chapel, Clydach, took place on the 1st inst. The new edifice cost 3,800*l.*, the contractors being Messrs. B. Hill & W. Jones, Clydach, who worked from designs prepared by Mr. W. W. Williams, architect, Windstreet, Swansea.

CONGREGATIONAL CHURCH, WALLSEND.—On the 5th inst. the opening of the buildings forming part of the Wallsend Congregational Church, Park-road, took place. The new church buildings are of stone, and were built by Mr. Hepple, Newcastle. Mr. J. W. Taylor was architect. The building will seat about 350.

MEDICAL SCHOOL BUILDINGS, DUNDEE.—The contracts have just been let for the erection of the new medical buildings in Dundee. The new buildings will belong to the University, but they are to be erected in the College grounds. The site chosen lies to the north of the Technical Institute and at the back of the present buildings fronting Perth-road. The designs show a four-story block. The old church in Small's Wynd and part of the present anatomy buildings are to be removed, and the west gable of the new school will abut on the wynd. The length of the building is to be 128 ft., and its height from the ground to the eave 64 ft. A feature of the design is the corridors running east and west, which divide each floor into two parts. All the rooms open into the corridors, to which access is gained from the principal staircase. The ground floor is to be devoted to the physiology department, and contains on the south side of the corridor a classroom, 52 ft. by 25 ft., together with Professor's room, photograph-room, and lecture-room; while on the north side are the history-room, chemical-room, instrument-room, and laboratory. On the first floor are to be the materia medica and public health departments. There are lecture-rooms for each department, together with Professors' rooms, laboratories, chemical-room, experimental room, and the other necessary accommodation for the work of the classes. Pathology and gynecology are to be accommodated on the second floor, which will also contain the museum and all adjuncts in the shape of classroom, laboratories, &c. The third floor is to be devoted to the anatomy department, and will contain, *inter alia*, a dissecting room 50 ft. by 32 ft., an embryology laboratory, and surgery. Surmounting the whole building is an observatory in which astronomical work will be done. The total cost of the buildings is to be about 14,000*l.*, while the fitting-up will involve a further outlay of about 6,000*l.* The plans were originally drawn up by the late Mr. J. Murray Robertson, architect, Dundee, and were completed by Mr. James Findlay, his successor. The following are the names of the firms whose contracts were accepted:—Builder's work, Mr. J. B. Hay, Dundee; joiner's work, Messrs. W. & R. Brownlee, Dundee; plumber's work, Mr. D. Brown, Dundee; plasterer's work, Mr. A. Ritchie, Dundee; slater's work, Messrs. J. Laburn & Co., Dundee; glazier's work, Messrs. Lindsay & Scott, Dundee; heating apparatus and hot water supply, Messrs. H. Walker & Son, Ltd., Newcastle-on-Tyne.

FIRE STATION, WEST HAMPSTEAD.—Mr. J. D. Gilbert, Chairman of the Fire Brigade Committee of the London County Council, recently opened a new fire-station which has been erected in West End-lane, facing the old village green of West End, West Hampstead. The building is what is known as a "full" station, and has been erected at a total cost, including the site, of 14,000*l.* The plans were prepared by Mr. W. E. Riley, superintending architect of the Council, and among the new features is an arrangement whereby four of the sets of quarters for the men and their families take the form of separate cottages erected at the rear of the station Accommodation is provided for a steam fire-engine (a double-cylinder engine by Merryweather), a horsed fire-escape, a hose cart, stabling for four horses, &c. The station is lighted by electricity.

INFIRMARY AND TRAMP WARDS, SOLIHULL, WARWICKSHIRE.—The opening of the new infirmary and tramp wards, part of the scheme proposed a few years ago for the reconstruction of the Solihull Workhouse, took place on the 4th inst. The work has been carried out by Messrs. W. & T. Thompson, builders, Solihull, from the designs of Mr. W. H. Ward, architect, Birmingham. The infirmary block provides accommodation for a total of eighty patients. The ground floor consists of two large wards, adjoining which are two separation wards with two beds each. At either end of the main block small special wards are provided, for use in special cases requiring isolation. These wards have independent sanitary accommodation. On the first floor are two large wards, and separate wards, similarly fitted up to those on the ground floor. The administration block is in the central part of the building. Connected with the infirmary building is the pavilion for the use of convalescents, and the maternity ward. Provision is made on the separate cell system for eight male vagrants, and there is immediate communication with the sleeping cells. There are also associated wards for thirty-two males, these being sub-divided and classified. On the first floor there is separate cell accommodation for the female vagrants. The tramp-master and mistress have commodious quarters, with clothes-drying and receiving rooms, and other accommodation. The work is executed in red brick, with stone bands and dressings, and brick strings, &c., the roofs being covered with tiles. The ward floors are laid with polished oak blocks; the corridors, lobbies, lavatories and bathrooms are laid with encaustic tiling. The wards are heated by means of down-draught double-fire stoves, and a steam boiler supplies all the steam for radiators in the corridors, linen rooms, &c, as well as for hot and cold water supplies. The cost per bed is about 80*l.* or 90*l.*

DARLINGTON POST OFFICE ENLARGEMENT.—A beginning has been made with the enlargement of the Darlington Post Office. The new building will be three stories high and have a frontage to Crown-street of about 100 ft. The basement is to be built of stone, and the two upper stories of brick, with stone facings. The basement will be occupied by a battery-room, engineers' stores, and boys' kitchen; and the ground-floor will contain a postmen's office, postmen's kitchen, and a number of other rooms. The first floor will have rooms for the sectional engineers, male and female clerks, and also accommodation for storage purposes. It is intended to make certain alterations in the existing premises, so as to increase the size of the sorting-rooms. The contract has been let to Mr. Shepherd, of York.

NEW BUILDINGS IN ABERDEEN.—Plans have been approved of by the Plans Committee of Aberdeen Town Council for the following buildings:—Dwelling-house on the west side of Anderson-drive, for Mr. Charles A. Bodie, per Messrs. Cameron & Watt, architects; four dwelling-houses on the west side of Bright-street, for Messrs. P. Bisset & Son, builders, per Messrs. Sutherland & Pirie, architects; dwelling-house on the south side of Braemar-place, for Captain Lauder, Walker-road, per Messrs. Sutherland & Pirie, architects; dwelling-house at South Esplanade (West), for Mr. John Black, engineer, per Messrs. Walker & Duncan, architects; two dwelling-houses on the east side of Albury-place, for Messrs. R. & J. Reid, carpenters, per Messrs. Brown & Watt, architects; stable and coach-house at the rear of No. 610, King-street, for Mr. George Boyne, per Mr. William Smith, architect; alterations in connexion with premises, Nos. 47-49, Union-street, for Mr. H. Simpson Gee, per Messrs. W. & J. Smith & Kelly, architects; alterations and additions in connexion with premises on the west side of Raik-road, for Messrs. Allan & Dey, per Messrs. Brown & Watt, architects; and herring-gutting and barrel-making premises at Sinclair-road, for Messrs. A. & A. Livingstone, per Mr. Duncan Hodge, architect.

MARKET HOUSE, MINEHEAD.—On the 4th inst. Mr. G. Hayward, J.P., Chairman of the Urban District Council of Minehead, laid the foundation stone of a new market house. The building is being erected from plans prepared by Mr. W. J Tamlyn, architect, of the town.

MONTROSE ASYLUM ACCOMMODATION.—At the meeting on the 14th inst. of Montrose Asylum and Infirmary Managers, plans drawn by Mr. John Sim, C.E., Montrose, of a villa proposed to be erected at the Asylum to accommodate sixty female patients were submitted. Mr. W. Douglas Johnston moved that the Managers approve of the plans and instruct the architect to prepare specifications and get in estimates, and also gave notice that at next meeting he would move that an expenditure of 6,500*l.* to meet the cost of the building be authorised. The motion was agreed to.

BUSINESS PREMISES, MILLWALL.—On the 29th ult. the new premises at Glengall-road, Millwall, in connexion with the works of Stuart's Granolithic Stone Co., Ltd., were inspected by a number of ladies and gentlemen. The buildings have been erected by Mr. P. Stuart from specifications and plans of Messrs. Clarkson, of Poplar.

NEW SCHOOLS, BIRKENHEAD.—At the last meeting of the Birkenhead School Board, the plans of Mr. Thomas W. Cubbon, of Birkenhead, were adopted for a block of educational buildings, including a pupil teachers' college and two higher elementary schools for 300 boys and 300 girls respectively. The pupil teachers' college has accommodation for about 150 students, and consists of the usual science and other classrooms, also large examination hall, library, dining-room, &c. The higher elementary schools are planned on the regulations of the new Minute of the Board of Education, and each includes, in addition to ordinary classrooms, central hall, chemical and physical laboratory, drawing classroom, and gymnasium. The boys' school also includes manual room, and the girls' school cookery and laundry accommodation. The site adjoins the General Post Office, and has cost 6,000*l.* The whole block of buildings is expected to cost about 30,000*l.*

THE BUILDING TRADE IN EASTBOURNE.—The following plans have been considered by the Building Committee, and the Committee recommend the Council to approve the same:—Surgeon-General Beatson (A. A. Oakden, architect, R. H. Stanbridge, builder), addition to Vicarsgrange, Grange-road.—Mrs. Sogno (A. Chandler, architect, Wm. Llewellyn, builder), addition to 30, Lushington-road.—J. McCann (J. W. Woolnough, architect, J. McCann, builder), pair houses, Arlington-road.—D. Allum (A. Chandler, architect), covered way, 19, Gorringe-road (no drain being under the building).—J. Barrow (A. Chandler, architect, J. Barrow, builder), seven houses, Birling-street.—Haybittle (A. Chandler, architect, W. Llewellyn, builder), alteration to shop front, 1, Elms-buildings.—M Martin, builder, addition to 36, Envs-road.—B. Stevens (A. A. Oakden, architect, B. Stevens, builder), amended plan, six similar pairs of houses, Meads-road.—J C. Lacey (J. C. Lacey, builder), detached house, Latimer-road,—G. E. Maynard (B. Earp, architect, J. Martin, builder), addition to furniture warehouse, rear of Whitley-road.—H. B. Hooper (J. W. Woolnough, architect, W. L. Wallis & Co., builders), pavilion, Compton-place-road—A. Huggett (J. W. Woolnough, architect, A. Huggett, builder), five houses, Green-street.—F. P. de Costobadie (A. A. Oakden, architect, E. Cornwell & Son, builders), alteration to premises, South-street.—Mrs. Newman (F. G. Cooke, architect, C. Breach, builder), addition to St. Andrew's Cottage, Meads-street.—Miller & Selmes (C. Crisford, architect, Miller & Selmes, builders), five cottages, Melbourne-road.—J. McCann (J. W. Woolnough, architect, J. McCann, builder), detached house, Arlington-road.

PROPOSED NEW BUILDINGS, &C., IN DUNDEE.—Plans and sections of proposed new buildings, &c., in Dundee, have been lodged with Mr. William Mackison, Burgh Engineer, to be submitted to a meeting of the Works Committee of the Town Council, as follows:—131, Ann-street: Additions to property for Mrs. Benvie.—Blackness-road: Dwelling houses for David Grant.—Blinshall-street: Restoration of warehouse for J. & J. Ogilvie.—Blinshall-street: Store for Samuel Worrall.—Hilltown and George street: Alterations on and additions to property for John U. M'Lachlan.—Lochee-road: Shops and dwelling-houses for William Anderson.—236, Lochee-road: Additions to pro

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perty for Mrs. M'Lean.—Ogilvie's-road: Alterations on and additions to property for Stewart Bros.—North William-street: Warehouse for J. Scott & Sons.—High-street, Lochee: Alterations on property for the North of Scotland Bank, Ltd.—Rosebery-street: Alterations on and additions to property for Gahan Bros.

LIBRARY, KILBURN.—On the 7th inst. the new Kilburn Branch Library, erected by the Hampstead Borough Council on a site between Cotleigh and Dynham-roads, West-end-lane, was opened to the public. The entrance to the new building is in Cotleigh-road. The cost of the site was 1,200*l.*; of the building, 2,400*l.*; of the fittings, 250*l.*; and of the installation of the electric light, 77*l.* The plans for the building were prepared by Mr. C. H. Lowe, C.E., the former Borough Surveyor, with the assistance of Mr. J. W. Lee, and have been carried out under the supervision of the present Engineer and Surveyor, Mr. O. E. Winter. Mr. J. Christie was the builder, and the electric light has been installed by Messrs. Roff & Son. The exterior of the building is of red brick, and the interior is of red and white bricks, with open timbered roof, windows filled with cathedral glass, and block flooring.

NEW COMBINATION POORHOUSE, CAMBUSNETHAN.—Mr. Alex. Cullen, Motherwell and Hamilton, has been selected to prepare plans of the new Combination Poorhouse to be erected at Cleland by the parishes of Cambusnethan, Bothwell, and Shotts. The cost of the new building will be about 20,000*l.*

INFECTIOUS DISEASES HOSPITAL, TROON, AYR.—It has been decided to erect a small infectious diseases hospital at Troon, to cost about 1,000*l.* Mr. Eaglesham, architect, Ayr, is to prepare plans.

FREE LIBRARY, WOLVERHAMPTON.—The new Free Library at Wolverhampton, built upon the site of the old Theatre Royal, Garrick-street, has just been opened. The architect was Mr. H. T. Hare.

SANITARY AND ENGINEERING NEWS.

BRIDGE, GUILDFORD.—The new bridge across the Wey at Guildford was opened on the 5th inst. The bridge, which has been constructed of iron girders of a span of 70 ft., takes the place of the old brick and stone structure which collapsed in the flood at Guildford nearly two years ago. It has been built from designs of Mr. J. Webster, M.Inst.C.E., by Messrs. Fasey & Son, of Leytonstone, the contract price being 5,596*l.*

SEWAGE DISPOSAL, BUXTON.—On the 4th inst. Mr. E. A. Sandford Fawcett, A.M Inst.C.E., held an inquiry at Buxton in reference to the application of the District Council to borrow 12,000*l.* for purposes of sewage disposal, including the construction of works in the urban district of Fairfield and the parish of King Sterndale. Mr. Grieves, surveyor, explained the scheme. He said the effluent had frequently been passed into the river containing a less percentage of albuminoid ammonia than was allowed by the County Council. They were anxious to turn the best effluent into the river, and would spare no expense to secure that object. There were no domestic water supplies below the tanks. Other evidence having been given, the inquiry closed.

WIDNES AND RUNCORN BRIDGE.—On the 6th inst. the first report of the Widnes and Runcorn Transporter Bridge Co. was made to the shareholders. The foundation work has been let to Messrs. W. Thornton & Sons, of Liverpool, and the superstructure to Arrol's Bridge and Roof Co., Ltd. Mr. H. L. Chase has been appointed resident engineer. It is expected the bridge will be completed about the middle of next year.

WATER SUPPLY, BARDNEY.—The Local Government Board refuse to allow the well sunk by the parish to be used for a public supply. The Welton Rural District Council have consequently resolved to submit the scheme as first recommended by their engineer, Mr. J. R. Elliott, of Nottingham, for approval. A loan for 3,000*l.* is to be applied for.

LEIGHTON BUZZARD SEWAGE DISPOSAL.—The Leighton Buzzard Urban District Council have received the sanction of the Local Government Board for a loan to enable them to convert their present sewage works (designed some years ago by Mr. Bertram Nicholls, C.E.) to the oxidation polarite system with Candy-Caink automatic revolving sprinklers and intermitters, which will enable the Council to save the expense of chemical treatment and do away with the present sludge difficulty. The work of conversion will be put in hand at once by the District Council's Engineer, Mr. J. Stewart.

MANCHESTER SHIP CANAL.—The half-yearly Report of the Engineer, Mr. H. Hunter, states that the depth of water in the ship canal and docks has been maintained throughout the entire length, but no relaxation of the dredging work has been possible, as the quantities of silt and sludge deposited in the waterway have continued without sensible diminution. Special dredging operations are being carried on for the deepening of the channel in the estuary of the Mersey which forms the access to the canal at Eastham; the work includes the removal of banks of silt and a certain quantity of rock. At Barton Locks the permanent greenheart upper gates of the 65 ft. lock have been fixed in place and the spare steel gates removed. The new traffic and railway offices in Trafford-road Salford, have been completed and are in use, and the station-master's office in the same road is in course of erection. Further progress has been made with the railway extension works authorised by the Act of 1900. The construction of the bridge which is to carry the through railway over the Lancashire and Yorkshire Railway is in hand, the retaining walls and other works between that bridge and the existing docks are being proceeded with, and, as possession of the racecourse has been obtained, arrangements have been made for proceeding with the formation of the last section of the line at once. The construction of the remaining section of the main road on the boundary of the company's property is also in hand, and portions of the service roads and railways have been completed, thus making a part of the land purchased available for the storage of timber, for which purpose it is in use. The embankments and slopes of the canal generally are in good condition, and the works throughout have been efficiently maintained. The large new transit shed constructed by the Manchester Ship Canal Warehousing Co., Ltd., on the north side of No. 8 Dock, is nearly complete. The whole of the electric cranes have been erected on the roof, and are at work, and the completed portions of the shed are in constant use for traffic purposes.

MARGATE WATER BILL.—Margate is to have an entirely new water supply. A poll of the Burgesses was taken under the Borough Funds Act last week, and the result was a victory for the Corporation, who are promoting this bill in Parliament. The figures were: for 3,370, against 1,748. Last year a unanimous Council was thwarted by an adverse vote of the burgesses of 364. The plan is that of Mr. Albert Latham, the Borough Engineer, and the scheme is to construct a pumping well and something like two miles in length of adits in the chalk hills about a mile to the south of the Wingham Springs, noted for their watercresses. An experimental well has been sunk, and the report of the experts is that the water is abundant in quantity and excellent in quality, sufficient to supply the whole of the Isle of Thanet and the district adjacent for many years to come. A pumping station will be constructed on the site with powerful engines, and a cast-iron main, fourteen miles in length, will be laid to Margate, crossing the river Stour at the new road lately constructed between Stourmouth and Monckton, supplying the villages en route. Included in the plans is a scheme for supplying eighteen parishes in East Kent under the jurisdiction of the Bridge and Eastry Rural District Councils. The estimate is 120,000*l.* The bill was read a second time in the House of Lords on Monday last.

FOREIGN.

INDIA.—A reconnaissance survey has been sanctioned by the agency of the East Indian Railway Company for a line of railway from Gya station eastwards to the town of Cutwa. It will be nearly 250 miles in length.——The Allahabad-Fyzabad Railway has been commenced, and the work is under the direction of Mr. J. L. P. Hogan, engineer-in-chief, Allahabad.——The Nilgiri Railway Company has arranged with the India Office for the extension of their hill line from Coonoor to Ootacamund, and the work is about to be commenced.——The Secretary of State has sanctioned the necessary expenditure for the construction of the Nowshera-Dargai Railway.——It is believed that Mr. W. Emerson, the President of the Royal Institute of British Architects, who has recently visited Calcutta, is about to prepare preliminary designs for the Victoria Memorial Hall in that city.——An extensive scheme has been prepared for supplying Moulmein with water; the works will be executed through the Public Works Department.——The largest irrigation work at present being undertaken in Upper Burma is the Shwebo Canal, which is estimated to cost about 48 lakhs of rupees. It will irrigate about 150,000 acres of land.——A Burmese art exhibition was held in the Jubilee Hall, Rangoon, on January 10 and 11 last. The exhibition was under the patronage of the Lieutenant-Governor.——The Burgess Memorial Ward, which is being erected at Mandalay, in connexion with the hospital, is nearing completion, and a nursing-house is to be built during the present year.——Large "central canal" workshops are being erected at Amritsar.——A large dock is being constructed at the end of the slipway at the Khoolna terminus of the Bengal Central Railway.

CHINA.—A railway line recently constructed from Tsingtao to Chingliang was inaugurated on the first day of this year. The line is now being pushed on to Weihaien, an important market town in Shantung, and the first supplies of Shantung coal are expected to be sent from that town during the next few weeks.

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.—A meeting of this Society was held on Friday evening, the 7th inst., when papers on "Stone" and "Brick" were read by Mr. James S. Robertson and Mr. Robert Armour respectively. The stones from the best known quarries of Scotland, with their characteristics, were described, and the manufacture and various types of local brick were also treated of in practical ashion.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Messrs. Easton & Co. have appointed Mr. G. D. Seaton, of 36, Islington-row, Edgbaston, Birmingham, as their representative for the Midland counties.——The Electric Lighting Boards Co. request that all enquiries should be addressed to the head office at No. 7, Pall-mall, S.W., to the Company, and not to individuals.——Mr. J. B. Colwill, surveyor, 6, Alma-road, St. Albans, has taken into partnership his son, Mr. E. G. Colwill; the style of the firm will be J. B. Colwill & Son.

THE PEABODY FUND.—The thirty-seventh annual report of the Peabody Fund shows that the sum given by Mr. Peabody was, in 1862, 150,000*l.*; in 1866, 100,000*l.*; in 1868, 100,000*l.*; and received by bequest from him in 1873, 150,000*l.*; making a total of 500,000*l.*; to which has been added money received for rent and interest, 859,997*l.* 1s. 4d., making the total fund on December 31 last 1,359,997*l.* 1s. 4d. The capital expenditure on land and buildings to the end of the year was 1,338,609*l.* 14s. 3d. The whole of the repairs, which include extensive drainage alterations at Blackfriars-road and Southwark-street, amount to 15,384*l.* 12s. 8d., and have been charged to income as formerly. At the end of the year the governors had provided for the artisan and labouring poor of London 11,439 rooms, besides bathrooms, laundries, and lavatories. These rooms comprised 5,150 separate dwellings, viz.:—100 of four rooms, 1,770 of three rooms, 2,440 of two rooms, and 849 of one room. The twelve blocks of buildings at Rosendale-road, Herne Hill, were nearly completed at the end of the year, and are now being let.

THE CHURCH CRAFTS' LEAGUE.—The League is holding its first general meeting of the year on Monday next, the 17th inst., at the Hall, Clifford's Inn, Fleet-street, E.C., when Mr. Roger Fry, M.A., will deliver a lecture (illustrated by lantern slides) on "Art Patronage of the Church in Italy during the Fifteenth Century." The Bishop of Rochester will be in the chair, and a collection of photographs of work done by the artist members will be on view at the conclusion of the lecture. Non-members of the League will be very welcome to attend, and they can obtain cards of admission from the Secretary, Mr. Francis Burgess, Church House, Westminster, S.W.

BERMONDSEY REFUSE DESTRUCTOR.—Messrs. Hughes & Stirling, the contractors who carried out the refuse destructor at Bermondsey, write that our statement that the destructor is "capable of consuming 50 tons of refuse per day" is below the mark; each of the six cells, they state, is capable of destroying 15 tons per day, making a total of 90 tons per day. We presume they are correct, though it is at variance with the information originally given to us.

TRURO CATHEDRAL.—A meeting of the Executive Committee was held on the 8th inst. to consider Sir Thomas Drew's Report on the fractures in the bases of the nave pillars in Truro Cathedral. The proceedings were private, but the following official Report has been communicated:—"There was a full attendance. Mr. F. L. Pearson, the architect, and Mr. Ward (of Messrs. Willcocks & Co., the contractors) were present. Sir Thomas Drew's Report was read. The details of this are at present confidential, and will not be published until the General Committee have received it. But permission is given to quote the following:—'My general impression is that the magnitude of the occurrence of such fractures as these should not be overrated, nor should they cause anxiety. Such unlooked-for occurrences are incidents in carrying out many building contracts, which are not heard of, and are of no outside interest, and are set right, and are to the builders a vexation, not an anxiety.' No immediate steps need be taken, but the contractor has been desired to furnish an estimate for the removal of one of the bases of the piers, in order that the knowledge of the causes of the fracture may be arrived at by actual inspection, and not rest only on theory."

DUBLIN MASTER BUILDERS' ASSOCIATION.—The annual dinner of the Master Builders' Association was held at the Antient Concert Rooms, when the President for the year, Mr. J. Beckett, occupied the chair. The chairman proposed "The King," which was duly honoured. Mr. Thomas Connolly proposed "The Health of the Lord Mayor," and the Lord Mayor responded. Mr. John Good proposed "Trade and Commerce," to which Sir Thomas Pile responded. He said that the trade and commerce of Dublin were closely associated with the Master Builders' Association. A great deal of the prosperity of the city must be attributed to the work which the building trade has so successfully done. A great deal of the progress that had taken place was due to the friendly relations between capital and labour, and he was glad to know that there were such friendly relations. An association like that of the Master Builders was sure to bring about a better feeling between employers and employed. Referring to the question of technical education, he said that the movement was progressing, and they might look forward in the future to highly cultivated labour, and not the labour that was of little use to the working classes of the city.—Mr. George Berry, J.P., Chairman of the Pembroke Urban Council, also replied, and said they wanted

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in the city a little more mutual organisation—that men should interest themselves in the trade they followed, working for the common cause and for the public benefit.—Mr. Wm. Mitchell, R.H.A., proposed the toast of "The Master Builders' Association." He referred to the important functions it had to fulfil, and the excellent manner in which it performed its work, and complimented the President on the high qualities which he displayed. The President, in the course of his reply, referred to the great loss sustained by the Association in the death of the late Alderman Meade, who had exercised such a powerful influence for the success of the Association. Their body had passed through many difficulties, including differences with their workmen, but they had now got to a state of content and happiness. Their Association showed that they would not withhold any help that could be given that their working men should be happy and contented and prosperous in their work. When the most had to be given for the least money no man with a heart in his work could do the work to his satisfaction, and he was glad to glean from Mr. Mitchell's speech that the architects were recognising this fact.—The health of the Chairman and of the guests having been proposed and duly honoured, the dinner concluded.

CHATHAM MASTER BUILDER'S DINNER.—At the Sun Hotel, Chatham, the annual dinner of the Chatham and District Master Builders' Association (affiliated with the South-Eastern Counties' Master Builders' Federation) was recently held, and there was a large assemblage, presided over by the ex-Mayor of Chatham (Alderman C. E. Skinner), supported by the Vice-Presidents, Mr. Walter West and Mr. G. D. Woollard, and Mr. R. W. Hogg, Hon. Treasurer. The President gave the loyal toasts, and Mr. J. R. Featherby, Chairman of the Gillingham Urban District Council, proposed "The Imperial Forces," coupled with the name of Capt. J. W. Nash (architect). Mr. G. E. Bond (architect) submitted "The Mayors and Corporations of Chatham and Rochester, the High Constable of Gillingham, and the Gillingham District Council," which was replied to by the Mayor of Chatham; Mr. G. Robinson (Rochester); Mr. J. R. Featherby, an ex-High Constable and Chairman of the Gillingham District Council. "Success to the Chatham and District Master Builders' Association" was proposed by Mr. A. B. Hearn (solicitor), and the President replied. Messrs. W. F. Wallis and T. Costigan responded to "The Southern Counties Master Builders' Federations," which was proposed by Mr. Walter West (Vice-President); Mr. H. E. Phillips proposed "The Local Architects," and Messrs. W. T. Boucher and E. J. Hammond replied. Mr. G. Hardy gave "The Surveyors of Rochester, Chatham, Gillingham, and Strood," to which those officials—Messrs. William Banks, C. Day, C. Candler, and J. Loach—responded. Mr. H. F. Whyman replied to "The Visitors," proposed by Mr. R. W. Hogg.

HOUSING IN NEWCASTLE.—The Sanitary Sub-Committee of the Newcastle-on-Tyne Corporation, as the result of an inquiry which has included visits to numerous other towns, recommend the provision of houses of the poorer classes in the three areas of Forth Banks, City-road, and Quality-row, 100 tenements in each area, to accommodate in round numbers 400 persons. The Sub-Committee propose that the tenements should be built in blocks on the general lines of those at Dryden and Rachael-streets, Liverpool, but in detail of individual dwelling to accord with the type of those to be erected by the Newcastle Corporation at Walker New-road, with such modifications or improvements as may suit local circumstances.

BARNSLEY BUILDING TRADES FEDERATION DINNER.—The annual dinner of the Barnsley Federation of Building Trades' Employers was held at the Royal Hotel, Barnsley, recently. The President, Mr. D. R. Snowden, occupied the chair. In responding to the toast of the "Barnsley Federation," which was given by Mr. J. Townsley (Hull), the President said he had no doubt that the Association was looked upon as a very flourishing institution, but he regretted that there was an apathy on the part of the members which ought not to exist, though he was glad to know that there were a few good honest workers, who were enthusiastic in pushing forward the objects of the Association. He alluded to the correspondence which had been going on lately in the Press on the subject of "Organised Idleness." He did not say that the worst cases mentioned were the average cases, and he did not say that there were not good and honest men among their employees, but unless the master builders were properly federated, there would soon be none. Since twenty-five years ago, the price of materials and the cost of labour had not increased to any very great extent, yet to-day a person desirous of building would have to pay 1,500*l.* for what would then have cost only 1,000*l.* This excess was not going to the builders, for as a community builders were not particularly well off. Their Association was formed to discover the leakage. Public as well as private work had cost more than formerly, yet the men were not better off. He appealed to builders to join the Federation, in order to effect an improvement all round, so that the worker could get good wages for good work done, the master a fair profit, and the capitalist 1,000*l.* worth of work for his 1,000*l.* spent.—Mr. J. Smith, Vice-President, also responded.—Mr. C. D. Potter gave "The National and all Federated Branches and Kindred Associations of the Building Trade," to which Councillor Mansfield, of York, President of the Yorkshire Federation, responded, saying that if it had not been for the federation of the master builders of Yorkshire, Lancashire, Cheshire, and Northumberland, and the National, trades-unions could have done just as they liked. Mr. J. Biggin, of Sheffield, also responded. Mr. W. G. England gave "The Town and Trade of Barnsley," to which the Mayor (Dr. Horne) and Mr. J. H. Taylor (Borough Surveyor) responded. Mr. W. Dunk proposed "The Architects," and Mr. Senior and Mr. H. Crawshaw responded.

REREDOS, PARISH CHURCH, DOWNEND, GLOUCESTERSHIRE. — An oak reredos has just been placed in Downend parish church in memory of the late Mrs. Skelton. The work of designing and executing the reredos was entrusted to Mr. Frank Bell, of Bristol.

NEW STALLS, SOUTHWELL CATHEDRAL.—On the 5th inst. the new stalls were dedicated at Southwell Cathedral by the Lord Bishop of the Diocese. The stalls, which fill two bays on either side of the chancel, were designed by Mr. Caroe, architect to the Ecclesiastical Commissioners, and the work was executed by Messrs. Cornish & Gaymer, of Walsall.

LEEDS BUILDING TRADES FEDERATION.—A meeting was held at the Grand Assembly Rooms, Leeds, on the 6th inst., under the auspices of the Leeds Building Trades Federation, to discuss the "go-easy" allegations as affecting the building trades of the city. The chair was occupied by Mr. Thomas Shortland, who was supported by representatives of the men engaged in the building and allied trades. The chairman said that if it were true that workmen were better off nowadays than they were a number of years since, it was equally true that the employers were also better off. Trade unionism had improved the character of the work as well as the status of the worker. A resolution was proposed by Mr. T. Newlove protesting against the articles published in the *Times* and other newspapers to prejudice the public against the workers in the building trades by stating that trade unionists were responsible for the high cost of buildings by a system of organised idleness; asserting that such statements were not facts, and were made with the sole intention of damaging the workers in the minds of the public, and pledging the meeting to use all legitimate means to counteract the erroneous impression created by circulating amongst the public indisputable facts. Mr. John Judge, in seconding the resolution, characterised the attack as a disgraceful attempt to slander working men. Mr. W. Bruce then addressed the meeting in defence of the men. Dealing categorically with the charges against the men, he denied emphatically that men did less work when the trade union officials were watching them. On the contrary, his experience was that they did more work and better work when their officials were present. They were charged that owing to their idleness the cost of buildings had gone up 15 per cent., and owing to increased wages a further 17 per cent., making in all an increased cost during the last twenty-four years of 32 per cent.; but he asserted with absolute confidence that men did as much work in nine hours now as they did twenty-four or twenty-five years ago. Continuing, he quoted a mass of detailed costs, which, he said, showed that masons' work had gone up during the period mentioned nearly 9 per cent., chiefly owing to the increased cost of materials, the benefit of which went to the brick-maker and the quarry-owner. Carpentry and joiners' work showed an increase of about 1½ per cent., principally owing to the increased cost of timber. Plumbing work showed a decrease of 2½ per cent., but owing to the manipulation of trade discounts it was made to show an increase of 2 per cent. On the whole, instead of an advance of 32 per cent., as charged, he could only find 12 per cent., and this was almost wholly due to the increased cost of raw material.—The resolution was adopted.

MASTER BUILDERS' ASSOCIATION, WESTON-SUPER-MARE.—The annual dinner of the local Master Builders' Association was held on the 6th inst. at the Railway Hotel, Mr. C. Addicott presiding over a large company. Dr. Duncan Grey proposed "The Imperial Forces," Quartermaster M. S. Dyer, N.S.Y.C, and Captain Keen replying. "Town and Trade" was submitted by Mr. A. R. Ford, and acknowledged by Messrs. S. C. Smith, W. H. Beedle, and H. Butt. "Architects and Surveyors" was given by Mr. D. Dyer, and responded to by Messrs. H. F. Price, S. J. Wilde, P. G. Fry, and H. Nettleton. The toast of the evening, "The Master Builders' Association," was entrusted to Mr. E. E. Baker, and acknowledged by the President (Mr. C. Addicott) and the Vice-President (Mr. W. M. Dubin). Other toasts followed.

BRISTOL MASTER BUILDERS' DINNER.—On the 6th inst. the annual dinner of the Bristol Master Builders' Association was held at the Royal Hotel, College Green, Bristol, the company numbering about eighty. The President (Mr. E. Walters) occupied the chair, and the Vice-president (Mr. George Wilkins) was in the vice-chair. The Chairman having proposed the loyal toasts, Mr. F. N. Cowlin submitted "The Lord Mayor and the Corporation of the City of Bristol," and spoke of the progressive policy which the Corporation were pursuing. The ex-Lord Mayor (Alderman J. Colthurst Godwin) and Mr. G. H. Perrin responded. Mr. W. H. Brown proposed "The Trade and Commerce of Bristol," and enlarged upon Bristol's hopeful future. As the trade increased the builder's prospects would improve.—Mr. Arthur Lee, in reply, said that although, generally speaking, the trade and commerce of Bristol during the last few years had been in a prosperous condition, the trade which that company more particularly represented had been for the past few months rather slack. That slackness was not by any means local, as he, unfortunately, had good reason to know. It was general, and it had arisen from the fact that materials and labour had gone up so rapidly that the value of houses and property had not yet accommodated itself to the economic position. He believed the local outlook was very promising, notwithstanding the recent slackness of trade. It might not be generally known that the Great Western Railway Company were going to put up huge creosoting works near the new dock, which would mean an enormous amount of timber being imported to Avonmouth. There was also the cold storage enterprise, which had now assumed practical shape.—Mr. A. Dowling proposed "The Architects and Engineers." Mr. Dare Bryan, who first responded, said that the architects of the city tried to hold the balance evenly between the building owner and the contractor.—Mr. Henry Williams followed, and agreed that Bristol was progressing rapidly. As to the conditions of labour, he was afraid they were teaching too many men to be foremen and scientific, and scientific often meant laziness. He urged builders to be more industrious themselves and to see that their men were industrious.—Mr. Averay Jones proposed "The National and South-Western Federations and Local Kindred Associations." He remarked that the organisation had been in existence a number of years, and before it was established there was no central body to which questions affecting the building trade could be referred.—Mr. A. Krauss acknowledged the toast, and spoke of the useful work which the National Association was accomplishing.—Mr. W. Church, a member of the Council of the National Federation, also replied and emphasised the importance of the organisation to the trade. He believed that before long the vexed question of contract would be settled in a way that would secure a universal form of contract.—The Town Clerk (Mr. E. J. Taylor) proposed "The Bristol Master Builders' Association," and said that the master builders were not only masters of themselves but of everybody for whom they carried out contracts. The President replied, and said he had endeavoured to serve the Association to the best of his ability. The Association was not aggressive. It was for the protection of the members against the combination of the workmen, and he was afraid that but for their Association and kindred associations builders would have had a very sorry time of it. The President-Elect (Mr. George Wilkins) was formally inducted, and the toast list concluded with "The Visitors," proposed by Mr. Geo. Humphreys and responded to by Mr. P. Addie.

THE NEW BUILDING BY-LAWS, MANCHESTER.—At a recent meeting of Manchester City Council, Mr. H. Grimshaw moved as an amendment that the amended by-laws prepared by the Buildings and Improvement Committee, which the Council were now asked to approve, be referred back. He said he had not had time to digest the whole of these by-laws. He was bound, however, to say that from personal experience those he had considered, relating to the building materials to be used, wanted carefully going through by someone who would devote honest thought and consideration to them. They seemed to him to a large extent to be a collection of fossilised ideas and elementary notions. One of them in particular contained manifest absurdities as to dimensions of timber to be employed in buildings, &c.—Dr. Dreyfus seconded the amendment. He said some of the dimensions laid down in the by-laws were entirely based on arbitrary and not on scientific lines, and would cause friction between the Corporation and the persons who erected buildings, whether dwelling-houses or works.—Mr. Lambert said the suggested new by-laws, with the amendments, were submitted to the Manchester Society of Architects for their consideration, and that body made certain observations and suggestions which were acted upon. They were under the consideration of the Society from July, 1898, to January, 1899. A deputation of the Improvement and Buildings Committee also had an interview with the Local Government Board in regard to them in March, 1901. In view of these circumstances he thought the by-laws had been carefully considered, and had received honest thought and careful consideration. Certain suggestions of the Local Government Board had been agreed to, and the draft was finally approved by the Local Government Board on January 3 last. He appealed to the Council to adopt the by-laws without further delay.—Mr. Sutton supported the amendment. He thought the Improvement Committee should at least compel applicants to build houses in which people could live, and not allow the erection of such "rat-traps" as were built at the present time.—Sir J. Harwood said, in the interests of public health there should

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be a minimum size fixed for a living-room. That he thought, was a matter upon which they would all be agreed, especially when they considered the case of a poor man with a large family.—The Lord Mayor said he was advised that the Local Government Board had no power to introduce anything of the kind into the by-laws.—The Town Clerk explained that the by-laws now proposed for adoption were in reality a relaxation of more severe by-laws which were already in existence.—Upon a division it was decided by thirty-three votes to twenty-five to refer the by-laws back for further consideration.

ART AND MODERN LIFE.—On Saturday evening last week, a lecture was delivered by Mr. Selwyn Image on "Some Aspects of Art and of Modern Life," at the Working Men's College, Great Ormond-street. The lecturer pointed out some of the artistic deficiencies of the present age. Individual buildings, however fine, were not enough to compensate for the fact that our ordinary architects and builders were deficient in the qualities necessary to the construction of a building artistically decent, let alone fine. He criticised the recent modernising of the houses in Bloomsbury-square, and contended that the transformation made in Russell-square had destroyed the character and proportions of house-fronts which, if plain, had had artistic quality. He also condemned the cheap showiness of most of the furniture offered for sale, and which he said was artistically a mass of rubbish. The indiscriminate application of machinery to the concerns of art was largely responsible for the evil. The consequent easiness of imitation contented us with poor shams, while endless reproductions had destroyed our taste for original handiwork. He urged his audience to help in bringing about improvement by simplifying their own homes, refusing anything which did not satisfy the conditions of good workmanship and thoroughly artistic decoration.

A RUSKIN MEMORIAL, WESTMINSTER ABBEY.—On Saturday last week Mrs. Arthur Severn unveiled in Westminster Abbey a bronze medallion of Ruskin which Mr. Onslow Ford finished not long before his own death.

MEDIÆVAL BUILDINGS UNDER YORK THEATRE.—In reference to the removal of a portion of St. Leonard's Hospital in the course of the alterations now proceeding at the York Theatre Royal, the architect, Mr. F. A. Tugwell, has made the following report:—"I wrote to the Museum authorities, offering them any portion of the old material which they decided to retain. The only portion of the undercroft which was in anything like a perfect condition was at the south-west corner of the building. The floor of this portion has been excavated down to the original level, the walls carefully pointed, and the groining made secure. This is now open to the public for the first time for many years. At the north of the back wall of the stage is a wall with two arrow heads, which may or may not originally have formed a portion of the Minster Close. The wall has not been interfered with. Underneath the stage we discovered a rather deep well, which bears signs of having been used for ages. This has been carefully cleaned out and covered over with a flag. In the caretaker's cottage there is a vaulted chamber, about thirteenth century, a portion of which has been used for coals, but which will now be used as a heating chamber. This, with a number of thirteenth century windows in the building, will not be interfered with in any way."

THE THEATRE ROYAL, BIRMINGHAM.—The old theatre in New-street was finally closed on the night of Saturday, January 4, and the ground will be cleared forthwith for the new building. The first theatre on that site was erected in 1774, at a cost of 5,660*l.* The interior having been consumed by fire—the act of an incendiary—in August, 1792, the house was reconstructed, and reopened by Macready the elder. A fire destroyed all of the structure—the Ionic portico, added in 1780, excepted—in January, 1820. A new house, for an audience of 2,900 persons, was rapidly rebuilt, at a cost of 14,000*l.*, and reopened on August 14 of that same year. In June, 1810, W. C. Macready made his first appearance on the stage at the Theatre Royal, in the character of Romeo.

CAPITAL AND LABOUR.

BLACKPOOL JOINERS' STRIKE ENDED.—After lasting fourteen months, the Blackpool joiners' strike has come to an end, a settlement being arrived at at a conference on Thursday last week. The men are to receive 8½*d.* per hour and time and a quarter for the first four hours' overtime.

PLASTERERS' WAGES, GLASGOW.—A strike of plasterers, involving over 400 men, began at Glasgow on the 10th inst. in consequence of the employers having declined to restore wages to the figure at which they stood previous to December. The wages at the reduced rate are 9*d.* per hour.

BUILDING DISPUTE, MAIDSTONE.—In response to the invitation to arbitrate between the masters and men in the building trade dispute at Maidstone, the Board of Trade has written to Mr. M. L. Crow, secretary to the Master Builders' Association, and to Mr. W. H. Oram, secretary to the Allied Trades, intimating that it has appointed Mr. G. R. Askwith, barrister-at-law, of 2, Pump-court, London, E.C., to act as arbitrator. The secretaries are now in communication with him as to the date and place of the meeting. It is expected that the arbitration will be held in Maidstone. It was arranged that the men should return to work, the lock-out having lasted for about five weeks.

LEGAL.

IMPORTANT ANCIENT LIGHT DISPUTE IN HOLBORN.

MANDATORY INJUNCTION GRANTED.

THE case of Parker *v.* W. F. Stanley & Co., Ltd., came before Mr. Justice Farwell in the Chancery Division on the 6th, 7th, and 8th insts. It was an action brought by Messrs. Parker, photographers and photographic artists, carrying on business at No. 288, High Holborn, to restrain the defendant company, mathematical instrument makers, from obstructing their ancient lights, the claim being for a mandatory injunction or, in the alternative, for damages.

Mr. C. F. Jenkins, K.C., and Mr. Colt appeared as counsel for the plaintiffs; and Mr. Bramwell Davis, K.C., and Mr. P. Wheeler for the defendants.

Mr. Jenkins, in opening the plaintiffs' case, said the premises, No. 288, High Holborn, were situated near the side wall of Lincoln's Inn-gardens. The plaintiffs had, in fact, been in occupation of this house for the purposes of their business since the year 1890, but their present title depended upon a lease granted to them and dated April 8, 1897. By that indenture a Mr. Hasluck granted the plaintiffs a lease of the premises for a term of fourteen years from March 25, 1897, so that the term expired on Lady Day, 1911. It was an ordinary repairing lease, the rent reserved being 180*l.* a year. No. 288, High Holborn was a very narrow building indeed. It was on the south side of Holborn, and therefore the front of the house faced due north. In the present case they were not concerned with the front of the house looking upon Holborn, but with a back extension of it of one story only, and which ran due north and south. That back extension was lighted only by windows in its roof. One series of lights looked east, and these had nothing to do with the action except that it was material to know that these eastern lights were very much blocked by larger buildings, and therefore the light to the windows on the western slope of the roof was the more material. This building was used by the plaintiffs for the purposes of their business in three different ways. A portion was what was called the gallery, and was used for exhibiting the plaintiffs' works of art, photographs, &c. Another portion was used as a studio for taking photographs and also for touching-up negatives by their artists, work which required a good light. The evidence was that, since the obstruction, that work had had to be given up, and also that in the taking of photographs great inconvenience had resulted from the diminished light. The last portion of this building was used by the plaintiffs substantially as their darkroom for preparing the photographs. The window to this room when it was required to be used as a darkroom was darkened by means of a shutter outside. There was a suggestion made by the defence that because this room had been used as a darkroom by the plaintiffs they had abandoned their light to it. Two answers would be made to that. If it was going to be treated by the defendants as a case of abandonment, which was the way it was pleaded, the answer was that abandonment must be a question of intention, and there was no abandonment. If the defendants put it against the plaintiffs that, although there was not sufficient evidence of abandonment, nevertheless there was sufficient evidence of non-user to prevent the plaintiffs claiming a title under the Prescription Act, the answer would be that it was immaterial because the plaintiffs could make a title to that ancient window by prescription at common law, and they could show that that was an ancient window long before the time when the plaintiffs began to use it for their purposes.

His lordship: A dark room is not permanently darkened, but only darkened for the purposes of business.

Mr. Jenkins: Certainly. If you dropped something and wanted to look for it you would put the shutter back.

Continuing, the learned counsel said that the plaintiffs' premises were very old, and the history of them, so far as it was material, began as far back as 1860. The tenancies had been fairly long ones. In 1860 these premises were in the occupation of a Mr. Wallis, who was a tailor and woollen and cloth merchant in a large way of business, and used them as a shop and warehouse and lived over them. The long building at the back was used by him as a fitting and cutting room, and also for keeping the cloths and woollen goods he had to show. The evidence was that he required a good light to these premises, and it always had been through the skylights. Mr. Wallis carried on business there up to about the year 1880. In that year the premises were taken by a Mr. Waller, who used them as a restaurant and eating-house. It seemed to have been a restaurant and eating-house run on a cheap scale, and the evidence was that sometimes they served as many as 1,000 meals a day. Waller used what the plaintiffs used as the gallery as the dining or luncheon room. The part the plaintiffs used as a studio was where Waller sat himself and checked the payment of the bills. The part still further back was used by Waller for cooking, and there was there still the old cooking-range. The plaintiffs succeeded to the property in 1890. The studio was practically now all glass. That was with the obect of getting the very best light. When they went in in 1890 it was not all glass. It had only two skylights, and the result was that the plaintiffs had much improved their light, but they had preserved in their new glass area the old glass area. For many years before the defendants erected their building, which was complained of, the land upon which it stood was vacant, and had been since 1884 or 1885. Previously to that time there had stood upon the land an old house. The evidence as to the size and dimensions of that old house would be very clear because the plaintiffs were able to call before his lordship the architect or surveyor who was actually employed in making a measurement and survey of the old house at the time when it was pulled down. Fortunately, they had his plans, and could give the dimensions of the old building with accuracy. The old building in one respect did not reach so far back as the present building, or so near the wall of Lincoln's Inn Gardens, by some 4 ft. That was material with regard to the window in the dark room because the greater part of this window had, for many years before the defendants' building was erected, a directly open light. That was interfered with by the defendants' building being carried some 4 ft. more towards the south than the old building. The old building was one with a ground floor, first floor, second floor, and attic. Of course, the plaintiffs themselves could not speak of what was the effect of the old building, because it was not there when they came into occupation of No. 288, but witnesses would be called who would speak of what the light was when the old building was there.

His Lordship observed that the old building seemed to have gone more to the north than the defendants' new building.

Mr. Jenkins said that was so, and plaintiffs had given credit for that as far as was necessary. The old building was irregular in its outline and not a square or oblong building like the defendants, and the fact that there was a large gap between the attic and the chimney-stack on the right was very important when one considered the question of direct western lights coming to the plaintiffs' windows. The writ in the action was issued on May 10, 1901, and served on May 11, 1901, and the plaintiffs applied soon after for an interim injunction before Mr. Justice Cozens-Hardy. There was some dispute on the evidence on the motion as the plaintiffs' evidence as to the old house was not then so clear as now. The defendants then refused to give an undertaking and the learned judge said that under the circumstances he would not interfere because if the defendants went on building they would do so at their risk as they could be ordered to pull down at the trial. The defendants by their defence had put in a plea that their building was substantially finished at the date of the writ and relied on the plaintiffs' laches. The learned counsel said that this was untrue, and that the defendants' building at the date of the writ was only a little above the line where obstruction commenced. The defendants did not desire to make money out of the case, and he asked his lordship to grant a mandatory order and not to treat the case as one for damages.

Mr. Chas. H. Webb, an architect and surveyor practising at Bedford-row, W.C., examined by Mr. Jenkins, said he had been acting for the plaintiffs in this matter. His attention was first called to the fact that building operations were going to be commenced by the defendants on the land to the west of the plaintiffs' house in February, 1901. He discovered from a section of plans shown to him by Messrs. Hayward & Maynard, the defendants' surveyors, that the defendants' building was probably going to a height of about 48 ft. 6 in. The wall of the defendants' building was 14 ft. 8 in. distant from the wall of the plaintiffs' building. On May 14 the defendants' building was 32 ft. 8 in. high. He had measured the building since it had been completed, and found that it was 46 ft. 6 in. high from the ground. It measured across from north to south 29 ft. 9 in. He saw the defendants' building from time to time after May 14, while it was being put up. The work was being hurried on. He had met Mr. Cox, a surveyor, who had produced to him certain plans of the old house which formerly stood on the site of the defentants' present building. He found that the old house extended to within about 9 ft. from the garden wall of Lincoln's Inn. The defendants' building went within about 4 ft. 6 in. of the garden wall. The defendants' building obstructed the plaintiffs' light. He and Mr. Frampton, a surveyor, had checked certain measurements. The defendants' building below 26 ft. 6 in. from the ground did not cause any obstruction to the plaintiffs' lights. The defendants' building obscured the plaintiffs' sky area to the extent of 625 superficial feet. The sky area obscured by the old building was 346 superficial feet. The difference was 279 superficial feet. As the defendants had

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given 35 superficial feet more to the north the practical difference of sky area was 244 superficial feet. The new building obstructed the whole of the direct light coming to the skylight in the dark room. This light was 2 ft. 6 in. long—about 1 ft. of the window might have been obstructed by the old building. With regard to the studio window the witness said that there was increased obstruction there. There was also considerable obstruction as to two of the gallery windows during part of the day. As an expert he should estimate the damage done to the plaintiffs' premises by the obstruction at 50*l.* a year or at 8½ year's purchase 412*l.* 10s.

Cross-examined by Mr. Bramwell Davis.

He had known the plaintiffs' premises for years. Since the year 1890 the windows of the studio had been enlarged—at least, he had been told so. The dark room window was an old one, and apparently no alteration had been made there. He had not been in the plaintiffs' premises before the old building was pulled down in 1885. On May 14, 1901, the defendants' building was 32 ft. 8 in. high. The height of the old house was 31 ft. 11 in. up to the parapet. He did not form any opinion whether there was obstruction on May 14. The building was being hurried on.

Mr. Alfred Frampton, A.R.I.B.A., Mr. H. C. Hawley, an auctioneer and surveyor, of Southampton-row, Mr. Cox, a surveyor, of Great James-street, Bedford-row, Mr. W. G. Parker, one of the plaintiffs, and other witnesses, also gave evidence in support of the plaintiffs' case.

At the conclusion of the plaintiffs' case, Mr. Bramwell Davis said that he would proceed to call his evidence before addressing his lordship on behalf of the defendants.

Mr. Chas. Forster Hayward, F.R.I.B.A., examined by Mr. Bramwell Davis, said he was an architect and surveyor, of Museum-street, W.C., and also District Surveyor for Bloomsbury, St. Martins-in-the-Fields, and Covent Garden. He remembered the old building, No. 3, Garden-place, before it was pulled down. He had to examine it as District Surveyor. It was a dangerous structure at the time he examined it, and a portion of it was ordered to be pulled down. Before it was pulled down he took dimensions of it, and produced the plans made at the time. On the east side of Garden-place the height of the old building, from the ground floor level to the parapet, was 33 ft. 3 in., and from the ground floor level to the top of the slope of the roof 39 ft. 9 in. The total length of the building from Lincoln's Inn gardens to the north-east corner was 38 ft. He had considered the question of whether the defendants' building, as compared with the old building, interfered with the light of the plaintiffs' studio. He did not consider there could be any serious interference with the light there, inasmuch as it was a skylight and not a window, and the light that had been spoken of as being so valuable, viz., that coming between the chimney stacks of the old building, could never have been sunlight.

Cross-examined by Mr. Jenkins.

He had known for many years of the existence of the plaintiffs' low building with the lights there. He considered that the old building was a great obstruction to the plaintiffs' lights. It simply obscured the western light. When the sun came towards the west, the only light which could be got by the plaintiffs was between the two chimney stacks of the old building, but no sunlight could be got by the plaintiffs between the two chimney stacks, as the sun was too low to have produced any appreciable effect on the plaintiffs' skylights.

Mr. King, an architect and surveyor, of Billiter-square, also gave evidence to the effect that the defendants' building created no substantial interference with the plaintiffs' lights.

Other evidence having been given, Mr. Bramwell Davis submitted that no case had been made out for a mandatory injunction, as the defendants' building created no substantial interference with the plaintiffs' lights.

Mr. Wheeler followed on the same side, contending that the plaintiffs had failed to bring themselves within the decision of the Court of Appeal in the case of "Warren and Others *v.* Brown."

At the conclusion of the learned counsel's argument his lordship, addressing Mr. Colt, asked if his clients, the plaintiffs, desired to press for a mandatory order. Would they not be content to take damages instead?

Mr. Colt replied that he was instructed to press for an injunction.

His lordship: There is considerable difficulty in working out an order, because, if the defendants are entitled to replace the old building, it will be of considerable difficulty to both. I think you ought to come to some arrangement.

Mr. Colt said he must press for a mandatory order.

His lordship then proceeded to deliver judgment. He said the defendants' counsel had very properly saved time by admitting that the plaintiffs' lights were ancient lights when they went into possession in 1890. That was subject to what he should explain afterwards. Since 1890 the plaintiffs had carried on the business of photographers in the premises, and the windows he had to deal with were the skylight in the studio and the skylight in the dark room. He would first of all deal with the skylight in the dark room. It followed from his finding of fact that the lights were ancient in 1890, the plaintiffs, in order to lose the right to this light, must have been shown to have released their right by acts or deeds which would indicate an intention to release it. He could not hold that the use by a photographer of a dark room was any evidence of his intention to extinguish his right to light coming into the window of that dark room. Whether he could have granted a mandatory order against the defendants in respect to the obstruction of the dark room light was another thing, but he did think there had been substantial diminution of the light coming to the dark room by what the defendants had done. The main contest, however, was as to the studio light. The plaintiffs some years ago altered the light in the roof slightly by removing it a few inches—about 9 in. to the east—away from the defendants' building, and glass had been put in over the whole of the roof instead of as before only in the particular portion represented by the old skylight. There was no doubt that that new glass roof covered in it the place occupied by the old windows. There had been a slight alteration, but very slight indeed, and which for the purposes of the present action, in his lordship's judgment, was immaterial. There could be no doubt that there was a cone of light coming over the property which formerly stood on the site where the defendants' building now stands to the plaintiffs' old window. It had been pressed upon him by the defendants' counsel that the plaintiffs had got no record of the exact size of the old window or the exact locality. He thought, however, that as the room was so small, and as the approximate size of the window, which he had got, had been sufficiently proved, all practical difficulty disappeared. He accepted the secondary evidence given by the plaintiffs on this point. His lordship then explained the difference between the defendants' new building and the old building which formerly stood on the site, and said that in his opinion the defendants' new building had materially diminished the access of light coming to the plaintiffs' old studio window. The evidence was all one way as to the requirement of a special light for photographic purposes. The evidence of the experts in photography called for the plaintiffs was conclusive in his lordship's mind, that as the old building formerly stood it obstructed some of the light to the plaimtiffs' studio, but that the defendants' new building materially increased the obstruction. In his judgment the plaintiffs were entitled to complain because they had been injured in their photographic business. He thought he should have found that for ordinary purposes there had been no such substantial diminution of light by the obstruction as to have justified him in granting a mandatory order, but he was clear that by what the defendants had done there had been substantial diminution of the light for photographic purposes.

He thought from the evidence that the plaintiffs' business had been seriously interfered with by the interference with their lights. Undoubtedly substantial damage had resulted to them from what the defendants had done. In these circumstances, he was constrained to grant a mandatory injunction to restrain the defendants from interfering with the plaintiffs' ancient lights as they were enjoyed when the old building was standing. The mandatory order would only apply to the excess in height of defendants' building, and did not extend to the 4 ft. by which the defendants' building had been carried more towards the south than the old building.

The plaintiffs were awarded the costs of the action.

His lordship granted a stay of execution on terms with the view to the defendants appealing from his decision.

CRUSHED BY A LIFT.

MR. JOHN TROUTBECK held an inquiry at the Westminster Court with reference to the death of Harry Black, aged fifteen years, of 11, Nottingham-street, Marylebone, who was fatally injured on an electric lift at 79, Davies-street, Berkeley-square, where he had been employed as page-boy for three weeks.

Sarah Evans said 79, Davies-street belonged to the Westminster Electric Lighting Corporation, and was let out as bachelors' chambers. She heard the lift go down with a crash and the deceased screaming.

James Paltridge, manager of the chambers, said he engaged the boy and thoroughly instructed him in the working of the lift. It was his duty to keep his hand on the lever governing the electric current, but at the moment of the accident he must have been at the front of the cage, as his foot was caught between the floor and the shafting. His body was jammed in a space of 3 in. There was no gate or barrier to the lift itself, but there was a lattice door on each floor. The cage was a small one, and it would not be possible to have a door to it.

Dr. George de Castro said he was on the spot within three minutes of the accident. The boy's body formed a wedge, rendering the lift immovable, and workmen had to manipulate the cage from below. The lift was easily worked, and witness had never seen any element of danger in it. He did not consider a second door advisable, as passengers would be apt to hold the trellis-work, and so get their fingers damaged.

Mr. Charles S. Peach, architect, said he thought there could be no doubt that the boy's foot caught in the collapsible gate when he started the lift. He believed when there was a gate to a lift it was not closed ninety-nine times out of a hundred.

The jury returned a verdict of accidental death.

A BUILDING DISPUTE, DALSTON.

THE owner of No. 24, Pownall-road, Dalston, appeared to an adjourned summons at the North London Police-court on the 7th inst., which alleged that he had disobeyed an order of the L.C.C. Surveyor (Mr. James Lovegrove), to make good a defective chimney shaft.

Mr. Helman-Pidsley appeared for the County Council, and said that Mr. Bros had adjourned the case to enable the defendant to call evidence to prove his contention that the shaft was not in a dangerous condition. The defendant handed up a letter he had received from a firm of "steeple Jacks," in which they certified that a year ago they had thoroughly overhauled the chimney-shaft and painted it, and put iron bands about it. And they were satisfied that it was in a safe condition.

Mr. Mead said this was not strictly evidence, and at the moment all the evidence he had before him was that of a skilled surveyor holding a responsible position under the L.C.C.

Mr. Lovegrove said the shaft was considerably out of the perpendicular. He did not ask that the entire shaft should be taken down, and would be content if 14 ft. of it were taken down. He could not order it to be rebuilt so long as the dangerous part was removed. But (added Mr. Lovegrove) I should not like to take the responsibility of this shaft, especially in the high winds that have prevailed.

The Defendant: That is a pretty good test of the stability of the shaft, seeing that it has withstood those winds. It is a serious matter for me if I have to pull the shaft down.

Mr. Mead said he would give the defendant another opportunity of showing that the shaft was not unsafe, and suggested an experienced surveyor and builder to give evidence on the point. If he decided not to further contest the order he could pull down the 14 ft. mentioned and inform the L.C.C. of what he was doing.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

18,152.—MANUFACTURE OF GLASS; *G. Leuchs and K. Leuchs.*—The inventors employ burnt titanic acid, obtained by chemical process, in the making of opaque or clouded glass or enamels. A compound of the acid ground with finished glass or enamel is applied as a coating, burnt on to the glassware.

18,172.—DRUMS FOR OIL VESSELS, &c.: *E. Channing*—At the head of the drum is a vent-tube, of which one end opens into the vessel and the other into the bung-hole, which has a drawing-off nozzle with an air passage leading into the tube, a passage for the liquid, and a lid. The nozzle when not being used can be turned inwards.

18,183.—MEANS OF CUTTING GLASS: *S. Disselkoen.*—A rapidly-moving disc mounted upon an endless wire or band, fed with corundum powder or some similar abrading substance mixed with oil, is used for cutting sheets, &c., of glass, and the band is passed through a hole, its ends being joined, made in the glass when it is desired to cut it from the middle. The inventor claims that the method will serve for giving any form desired to the cut edges.

18,184.—HOLDERS FOR ELECTRICAL LAMP-SHADES AND REFLECTORS: *Spiral Globe (Limited) and E. A. Livet.*—A cup is fashioned with the coils of a glass rod and encloses the main part of an electrical incandescent lamp bulb, being sustained with light springs that rest against it inside and are coiled upon one plane.

18,196.—SAFETY LAMPS FOR USE BY MINERS AND OTHERS: *C. Linsin.*—For locking and unlocking purposes the edges of a ring are turned over adjacent flanges of the upper and lower parts of the lamp. The turning of another ring by a lever presses dogs inwards, through the movements of pins in slots, so as to bend the edges of the first-named ring over the flanges and thereby lock them together. When it is desired to unlock the lamp, one puts it in the apparatus in such a position that the spring fingers will grip a groove upon the lower part of the lamp, whilst the dogs, under the action of the lever, grip a groove upon the upper part, whereupon the lower part can be pulled down by causing a lever to turn the eccentric on to which the fingers are fastened, and thus opening the edges of the locking-ring.

18,207.—A FASTENING FOR WINDOW SASHES: *G. M. Asher.*—On to a standard on one sash is pivoted an S-shaped hook for engagement with a lip of the catch-piece carried upon the opposite sash when it has been moved forwards by means of a screw; the tightening-up of the screw will tend to prevent the sashes from rattling and to exclude draughts.

18,208.—MEANS OF INCREASING THE ILLUMINATING POWER OF INCANDESCENT AND OTHER GAS LAMPS: *W. Theobald and G. Theobald.*—A cup-shapened cap, held in its place with projections

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from it, or with a metallic crown upon the chimney, contracts the outlet at the upper end of the chimney. The arrangement is described as being particularly useful when applied to incandescent burners when the gas supply is but partially turned on.

18,211.—A WASHER FOR GAS: *D. Chandler and S. B. Chandler.*—A vertical cylinder is fitted with a middle shaft, to be turned with gearing, and of which the brushes are wetted by water admitted through the top of the cylinder, the gas flowing upwards. The inventor contrives otherwise that the brushes, when mounted upon a horizontal shaft within a gas-tight cylinder, shall be dipped into a shallow tank holding liquid with each rotation of the shaft, the gas flowing through the washers in a horizontal direction.

18,213.—COVERS FOR MAN-HOLES: *R. Herman.*—Hanging flanges are fashioned upon the cover that will dip between concentrical flanges which rise up from the bottom plate of the casing. The forcing of water past the seals into the man-hole is obviated by making the innermost of the latter flanges higher than the encompassing flange.

18,232.—A SAFETY-VALVE FOR DOMESTIC AND KINDRED HOT-WATER SUPPLY SYSTEMS: *F. Davey.*—A spherical valve, made of india-rubber or some such substance, is guided with wings, and its stem is inserted through a stuffing-box, or when the valve is "blowing off" the repose of the ball upon a seat on the cover will effect a tight joint. A reservoir is also provided, having a pipe, with two branches, at its upper end; one branch communicates with the service-pipe, and is fitted with a relief-pipe; on the other branch is a screwed cap for filling the reservoir. A weighted safety-valve, as described, and fitted with an escape-pipe, is mounted upon the upper end of the pipe above the point of divergence of its two branches.

18,272.—DOGS FOR LIFTING PURPOSES: *P. McClintick.*—A U-shapened strip is put between the jaws of the dog and a cross-bar, two ropes are passed through holes near the hinge, thence to the opposite jaws to which they are fastened, and so through openings in the cross-bar and in the strip; thus the jaws will hang in the opened position when held up by the tied ends of the ropes, but will become shut together when those ends are slackened and the jaws are held up by the ropes from their other ends.

18,277.—A PORTABLE HYDRAULIC PRESS FOR WORKMEN'S USE: *T. J. McTighe.*—In one form, as adapted for splicing electrical cables, a cap fits upon the cylinder which holds the ram that has a stem surrounded with a spring pressing against it. The upper die is pressed by the end of the stem, whilst the lower die fits into undercut grooves of arms that extend from the cylinder and can be easily removed. The principle of the invention is adapted also for self-contained presses, and for punching, riveting and similar tools.

18,282. — ELECTRICAL JUNCTION-BOXES: *F. A. Feckell.*—The bolts and nuts which secure the two halves of the box to one another also unite lugs upon the halves or upon metallic half-clips. The boxes (of earthenware, &c.) are after the kind (of iron) specified in No. 17 525 of 1894.

18,301.—WIRE SCREENS FOR SIFTING, SCREENING, &C.: *R. Harwood and H. Callon.*—The frame of a reversible screen has sides and inclined end plates pierced for the square-headed pins upon which the wires are stretched, the tension being imparted by means of a box-key. The number of wires can be altered for varying the mesh, being evenly spaced with grooved or screwed rods, and the screen can serve for the bottom of an inclined shoot.

18,308.—IMPROVEMENTS IN KILNS: *A. T. Macfarlane.*—A fixed or rotatory casing is disposed around an ordinary rotatory kiln, the space within is utilised for drying powdered coal, cement, slip, slurry, and so on before they are treated in the kiln, the material being distributed and conveyed by buckets, projections, helical blades, screws, &c., inside the casing.

18,335.—A CONTRIVANCE FOR FASTENING SASH-CORDS: *O. Wallman.*—A block, grooved around its periphery, has two parallel holes; one end of the cord is passed through one of the holes, through the counter-weight, through the other hole in the block, around the groove, and then through the loop thus formed above the block; the other end of the cord is attached to the sash by means of a similar block.

18,339.—SLABS AND COVERINGS FOR WALLS, CEILINGS, BULKHEADS, &C.: *F. Christie.*—Slabs for sound-deadening and fire-proofing purposes consist of silicate cotton laid between expanded metallic sheets and wire net-work with staples and wire holders; a sheet of stout paper may be inserted between the metal and the cotton, and the ribs of the expanded sheets are inclined so as to hold plaster.

18,350.—KILNS AND FURNACES FOR CEMENT: *Fellner and Ziegler.*—The inventors provide a metallic removable head which joins the burning and cooling drums, or the burning and drying drums, and fit it up with a water-circulating jacket or with a fire-resisting lining.

18,360.—A STAGE FOR USE IN BUILDING, HOUSE PAINTING, &C.: *M. Sarpy.*—The stage is adapted for use in repairing and painting staircases. It rests upon two cross-bars, which are supported by the horizontal bar or arm of a vertical piece or standard, on which are a bracket or foot, a swivel-catch fitted with cords, and guard-rods. The foot will rest upon one of the steps of the stair, and the vertical standard can be fastened in position by means of cords and cross-bars. A gusset-plate joins the horizontal bar beneath the stage and the vertical limb.

18,369.—STAIR TREADS: *E. S. Higgins and Safety Tread Syndicate.*—Strengthening ribs are fashioned lengthwise and transversely upon the treads, which also are recessed to take the risers. The open-flanged frames, recessed for the risers, are bolted on to stringers of wood or metal, or are built into the walls, and drainage-channels extend around them. Screws through lugs in the frames keep the treads in position, and the joints are packed to render them watertight. The steps are described as being more particularly adapted for heavy traffic, and the treads are after the kind specified in No. 5,988 of 1891.

18,374.—A COVERING FOR WALLS, &C.: *Salubratapeten-Fabrik Basel.*—A textile fabric is firstly printed or coated with oil paints, colours, and so on, and is then treated with an embossing-roller, very finely fluted, in order to give a silky gloss or similar effect to the surface of the fabric.

18,400-1.—FACING-TILES AND WALL-BLOCKS: *T. J. Woods.*—The tiles are fashioned with dove-tailed grooves on their backs in order to take cement or plaster. The blocks for damp-proof courses are pierced and have rebated interlocking edges, cement being filled in the joints.

18,406.—A CIRCULAR-SAW GUARD: *W. Grant and W. Grant.*—On the radial arm of the carrying-bracket is adjusted a middle piece, to which are hinged two extensions, which constitute the guard; a ratchet-toothed rod which engages with a fixed arm will enable one to set the front hinged piece at any angle desired, and a stop restricts the height to which the other hinged piece can be lifted. At the back of the bench is a forked bracket, adjustably secured with bolts and slots, on to which the radial arm is hinged. The riving-knife is fixed to a plate underneath the bench, and a T-headed bolt through a slot serves for clamping the radial arm in its place, the bolt being turned and tightened up.

18,433.—A LADDER FOR ESCAPE FROM FIRE AND FOR WORKMEN'S USE COMBINED: *J. Charman.*—The links of a folding ladder are pivoted together, and through some of them are passed the rungs which are secured with rivets; struts, threaded upon a common rod, carry the ladder at a suitable distance from the wall, and they are joined to some of the links with screwed bolts or rods passing either through the links outside the rungs or through the rungs themselves; in another form short screws through the thickened and tapped centres of the links are employed for fastening the struts to the ladder links; chains, clamped to the window-sill, are attached to the top of the ladder, which may be adapted as a stage for use in painting, decorating, window-cleaning, and so on, by detaching its lower portion and fastening the upper five rungs in a line by the struts and two further pairs of tie-rods at its lower end; the workman will stand upon the bottom rung, and steady himself against a cross-bar between the tie-rods.

18,437. — TREADS FOR PAVING AND SIMILAR PURPOSES: *Universal Safety Tread Co.*—The inventors devise means for joining a non-slipping material to base plates of hard metal; they cause strips of lead, or some such non-slipping material, to be pressed between parallel rows of projections fashioned upon the base plates; after that operation the projections are forced inwards into the strips which are secured in their places by means of spaced holes in the plates.

MEETINGS.

FRIDAY, FEBRUARY 14.

Architectural Association.—Miss Ethel M. Charles, A.R.I.B.A., on "A Plea for Women Practising Architecture." 7.30 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. J. Priestley on "Sanitary Law,"—II. 7 p.m.

Sheffield Society of Architects and Surveyors.—Mr. C. Hadfield on "True Building."

Institution of Civil Engineers.—(Students' meeting). Mr. C. Johnston on "Some Public Health Aspects of the Question of Sewage Disposal." 8 p.m.

SATURDAY, FEBRUARY 15.

Architectural Association.—Second Spring Visit, to the Victoria and Albert Museum and Royal College of Science, Kensington, by permission of the architect, Mr. Aston Webb, A.R.A. 2.30 p.m.

Royal Institution. — Rt. Hon. Lord Rayleigh on "Some Electrical Developments"—I. 3 p.m.

Hartley College Engineering Society (*Southampton*).—Mr. McFadyean on "Southampton Docks: Past and Present." 7 p.m.

MONDAY, FEBRUARY 17.

Royal Institute of British Architects.—Mr. F. W. Bedford on "Baldassare Peruzzi." Illustrated by Lantern Slides. 8 p.m.

London Institution.—Mr. E. Freshfield, F.S.A., on "Archæology in London as a Pastime for a Busy Man." 5 p.m.

Society of Arts (*Cantor Lectures*). — Mr. Cyril Davenport, F.S.A., on "Personal Jewellery from Prehistoric Times"—II. 8 p.m.

Royal Philosophical Society of Glasgow (*Architectural Section*).— Professor Cooper, D.D., on "An Early Description of an East Syrian Church with its Connected Buildings, from the recently published 'Testamentum Domini,' with some Notices of the Service at that time."

Liverpool Architectural Society. — Mr. R. Holt on "Brickwork." 6 p.m.

Church Crafts' League (*Clifford's Inn, Fleet-street*).—Mr. Roger Fry, M.A., on "Art Patronage of the Church in Italy during the Fifteenth Century."

TUESDAY, FEBRUARY 18.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. J. Priestley, B.A., on "Sanitary Law"—III. 8 p.m.

Institution of Civil Engineers.—Messrs. W. M. Mordey and Bernard M. Jenkin on "Electrical Traction on Railways." 8 p.m.

WEDNESDAY, FEBRUARY 19.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. J. Priestley, B.A., on "Duties of a Sanitary Inspector: I.: Outdoor." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members. 8 p.m.

Edinburgh Architectural Association.—Mr. R. F. Sherar on "Architectural Perspective." Illustrated by lime-light views. 8 p.m.

Institution of Civil Engineers.—Students' visit to the Works of Messrs. John I. Thornycroft & Co., Ltd. Church Wharf, Chiswick, W. 2.30 p.m.

THURSDAY, FEBRUARY 20.

Institution of Electrical Engineers (*Dublin Section*).—Mr. W. Tatlow, M.A., on "Irish Water-Power and its Electrical Development." 7.30 p.m.

Carpenters' Company (*Free Lectures on Matters connected with Building*).—Professor J. A. Fleming on "The Transmission of Light and Electricity." 8 p.m.

FRIDAY, FEBRUARY 21.

Architectural Association Discussion Section.—Mr. F. C. Eden on "The Organ: Its Proper Position and Architectural Treatment." 7.30 p.m.

Royal Institution.—Mr. W. Duddell on "Musical and Talking Electric Arcs." 9 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. Priestley, B.A., on "Duties of Sanitary Inspectors: II.: Indoor." 8 p.m.

Institution of Mechanical Engineers. — Fifty-fifth Annual General Meeting, when the annual report of the Council will be presented to the meeting, and the results of the ballot for the annual election of the President, Vice-Presidents, and Members of Council will be announced. Subsequently, the meeting will be made "Special," for the consideration of a preposal to increase the number of ordinary Members of Council from fifteen to twenty-one, and to provide that seven instead of five Members of Council shall retire annually. The discussion on "Modern Machine Methods" will be concluded, and the author, Mr. H. F. L. Orcutt, will reply. If time permit, the following short papers on the "Fencing of Different Kinds of Machinery" will be presented, with a view to their being collectively discussed on Friday, March 21:—"Fencing of Steam and Gas Engines," by Mr. Henry D. Marshall; "Fencing or Guarding Machinery Used in Textile Factories," by Mr. Samuel R. Platt; "Protection of Lift-Shafts, and Safety Devices in Connexion with Lift-Doors and Controlling Gear," by Mr. Henry C. Walker; "Guarding Machine Tools," by Mr. W. H. Johnson.

Birmingham Architectural Association. — Paper by Mr. E. Wood.

Glasgow Architectural Craftsmen's Society.—Mr. T. S. Fraser on "The Renaissance of Scotland." 8 p.m.

SATURDAY, FEBRUARY 22.

Builders' Foremen and Clerks of Works' Institution.—Annual dinner, King's Hall, Holborn Restaurant. 6 p.m.

Builders' Foremen's Association.—Mr. A. S. E. Akermann, M.Inst C.E., on "Five thousand miles through the States of America."

Institution of Junior Engineers.—Visit to the New Baths and Washhouses of the Borough of Fulham, Melmoth-place. 3 p.m.

Royal Institution. — Rt. Hon. Lord Rayleigh on "Some Electrical Developments" (II.). 3 p.m.

Sanitary Institute (*Demonstrations for Sanitary Officers*).—Inspection at Lambeth Disinfecting Station, Wanless-road, Loughborough Junction. 3 p.m.

Edinburgh Architectural Association.—Visit to the North British Railway Co.'s Hotel at Waverley.

Dundee Institute of Architecture. — Visit to Dunfermline.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

January 30.—By HARDS & BRADLY (at Greenwich).

Greenwich.—5, 7, and 9, Royal Hill, f., r. 98*l.* 10s. £1,420
51, London-st., f., r. 65*l.* 1,130
48, Point Hill, f., r. 28*l.* 465
67, Ashburnham-grove, u.t. 44 yrs., g.r. 4*l.* 10s., r. 28*l.* 300
13 and 15, Norman-rd., u.t. 41½ yrs., g.r. 6*l.*, r. 39*l.* 350
17, 19, and 21, Norman-rd., u.t. 40 yrs., g.r. 9*l.*, r. 58*l.* 10s. 430
1, 3, and 5, Dutton-st., u.t. 18½ yrs., g.r. 12*l.* 10s. 415
Point Hill, f.g.r. 11*l.* 5s., reversion in 80½ yrs... 310
12, Earlswood-st., f., r. 26*l.* 410
Blackheath.—1, Mildred-villas, f., r. 34*l.* 560
Lewisham.—198, Ennersdale-rd., u.t. 65½ yrs., g.r. 4*l.* 10s. 360
By BRIDGMAN & SON (at Waltham Cross).
Cheshunt (Herts).—Longfield-lane, enclosure of land, 5 a. 2 r. 18 p., f. 820
Longfield-road, moiety of plot of land, 1 a. 0r. 21 p., f. 220
Park-lane, Black Dole Field, 5 a. 0 r. 8 p., f. .. 840

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February 4.—By DEBENHAM, TEWSON, & Co.
Hoxton.—1 to 7, Academy Buildings (warehouses, u.t. 57 yrs., g.r. 214*l.*, r. 895*l.* £5,250
Islington.—Lofting-rd., f.g.r.'s 28*l.* 7s., reversion in 7 yrs. 2,475
Lofting-rd., &c., f.g.r.'s 99*l.*, reversion in 7 yrs. 840
Thornhill-rd., &c., f.g.r.'s 69*l.*, reversion in 7 yrs. 5,000
Upper Park-st., peppercorn g.r., reversion in 7 yrs. 1,650
Liverpool-rd., &c., f.g.r.'s 57*l.*, reversion in 7 yrs. 7,150
Upper Park-st., f.g.r. 20*l.*, reversion in 7 yrs. .. 2,700
Lofting-rd., f.g.r.'s 76*l.*, reversion in 7 yrs. 6,420
Lofting-rd., The Barnsbury Arms b.-h., f.g.r. 6*l.*, reversion in 7 yrs. 1,050
Liverpool-rd., f.g.r.'s 22*l.*, reversion in 7 yrs... 1 940
By G. HERBERT-BURNS.
Gunnersbury.—14, Thorney Hedge-rd., f., r. 38*l.* 600
By S. WALKER & SON.
Bermondsey.—14, Kintore-st., u.t. 51 yrs., g.r. 3*l.* 4s. 173
Stockwell.—Hubert-gr., f.g.r.'s 54*l.*, reversion in 77½ yrs. 1,350
Hubert-gr., f.g.r.'s 7*l.*, reversion in 77½ yrs..... 220
Landor-rd., f.g.r.'s 26*l.*, reversion in 77½ yrs. .. 755
Landor-rd., f.g.r.'s 6*l.*, reversion in 77½ yrs..... 397
Highbury.—Avenell-rd., &c., f.g.r. 18*l.*, reversion in 76 yrs. 500
Surbiton, Surrey.—Paragon-gr., f.g.r.'s 22*l.*, reversion in 92 yrs. 560
Plaistow.—High-st., f.g.r. 30*l.*, reversion in 35 yrs. 900
By HUMBERT & FLINT (at Watford).
Bushey, Herts.—8 and 10, High-st., f. 240
February 5.—By Horne & Co.
Bayswater.—104 and 108, Queen's-rd., u.t. 46¼ yrs., g.r. 20*l.*, r. 195*l.* 10s. 3,300
By FRANK JOLLY & Co.
Leytonstone.—74, Wallwood-rd., f., r. 24*l.* 360
By REYNOLDS & EASON.
Fitzroy-sq.—8, Charlotte-st., c., r. 65*l.* 1,700
February 6.—By H. J. BROMLEY.
Forest Hill.—93, Brockley-rise, u.t. 68¼ yrs., g.r. 6*l.* 395
Whatman-rd., a plot of freehold land 210
133 and 135, Stanstead-rd., u.t. 75 yrs., g.r. 18*l.* 18s., r. 102*l.* 1,090
By C. H. BROWN.
Pimlico.—64, Lupus-st., u.t. 26¼ yrs., g.r. 12*l.*, r. 90*l.* 870
218, Alderney-st., u.t. 29½ yrs., g.r. 9*l.*, r. 55*l.*... 480
50 and 56, Ranelagh-rd., u.t. 22 yrs., g.r. 15*l.*, r. 72*l.* 425
Dorset-st., Dorset Mews, stabling and yard, u.t. 41 yrs., g.r. 12*l.*, e.r. 40*l.* 305
9, Effingham-st., u.t. 28 yrs., g.r. 16*l.*..... 350
Shoreditch.—38, Hackney-rd., f., e.r. 60*l.*..... 670
By NEWBON, EDWARDS, & SHEPHARD.
Kentish Town.—30, Leighton-grove, u.t. 39 yrs., g.r. 8*l.* 15s., e.r. 42*l.* 355
Holloway.—9, Victor-rd., u.t. 70½ yrs., g.r. 6*l.*.... 300
Hornsey.—94, Lausanne-rd., f., e.r. 55*l.* 670
By WORSFOLD & HAYWARD (at Dover).
Dover, Kent.—12, St. Andrew's-ter., f. 305
20, Branch-st., f. 110
2, Guildford-ter., u.t. 63½ yrs., g.r. 4*l.* 10s..... 300
Northampton-st., workshop and stores, u.t. 64 yrs., g.r. 1*l.* 10s., r. 15*l.* 250
37½, Snargate-st., and stable, &c., in rear, u.t. 64 yrs., g.r. 6*l.*, r. 5*l.* 300
Shepherdswell, Kent.—The Ter., Sunnyside, f., r. 30*l.* 350
Lydden, Kent.—Dover-rd., the Hope Inn b.-h., f., r. 30*l.* 1,150
Dover-rd., four freehold cottages..... 230
Dover-rd., two freehold meadows, 7 a. 2 r. 0 p... 280
February 7.—By RIDER & SONS.
Notting Hill.—1 and 3, Mary-pl., u.t. 30 yrs., g.r. 12*l.* 10s., r. 70*l.* 4s. 460
Acton.—29 and 31, Rothschild-rd., f., r. 65*l.*..... 620

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 11 6	per 1,000 alongside, in river.
Rough Stocks and Grizzles.....	1 9 6	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 5 0	,, ,, ,,
Flettons	1 8 0	,, at railway depôt.
Red Wire Cuts ..	1 12 0	,, ,, ,,
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,, ,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	per 1,000 at railway depot.
Do., Bullnose	4 10 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 5 6	,, ,, ,,
GLAZED BRICKS		
Best White and Ivory Glazed Stretchers.....	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,, ,,
Double Stretchers	10 0 0	,, ,, ,,
Double Headers..	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	20 0 0	,, ,, ,,

PRICES CURRENT (*Continued*).

BRICKS, &c.

	£ s. d.	
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	per 1,000 at railway depot.
Quoins, Bullnose, and Flats	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers..	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	14 0 0	,, ,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,, less than best.
	s. d.	
Thames and Pit Sand	7	3 per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	32 0	per ton, delivered.
Best Ground Blue Lias Lime..	25 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. od. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6½	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 3	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks ..	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	s. d. 2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,
,, ,, 5 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2	7 per ft. super. deld. rly. depôt.
,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	12 0	0 per 1000 of 1200 at ry. dep.
,, best seconds ,,	11 10 0	,, ,,
16× 8 best ,,	6 15 0	,, ,,
20×10 best blue Portmadoc ..	11 5 0	,, ,,
16×8 best blue Portmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green....	12 2 6	,, ,,
16× 8 ,, ,,	7 5 0	,, ,,
20×10 permanent green	10 5 0	,, ,,
16×8 ,, ,,	5 17 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles..	41 6	per 1,000, at rly. depôt.
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes).	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	14 10 0	16 0 0
Deals: best 3 by 9.....	13 10 0	15 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	10 10 0	11 10 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in. ..	8 10 0	9 10 0
2 in. by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0 0
Foreign Sawn Boards—		
1 in. by 1¼ in. by 1¼ in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft.	
	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks.....	2 15 0	3 0 0
Pitch-pine timber (30 ft.).....	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
,, ,, 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens.....	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.....	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens.....	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.....	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens.....	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
Battens.....	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
,, ,, ,, 3 in. by 9 in.	12 0 0	13 0 0
,, ,, ,, battens.....	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes..	32 0 0	33 10 0
Broads (12 in. and up).....	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 3 0
Small ,, ,, ...	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
¾ in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube.....	0 3 0	0 3 6
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars.....	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars.....	9 0 0	9 10 0
Hoop Iron, basis price.....	9 5 0	9 15 0
,, ,, galvanised.....	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.....	10 0 0	- - -
,, ,, to 24 g.....	11 0 0	- - -
,, ,, to 26 g.....	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.....	14 0 0	- - -
Sheet Iron, Galvanised, flat, best quality:—		
Ordinary sizes to 20 g.....	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.....	18 10 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 10 0	10 0 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 0 0	- - -
Pipe in coils	14 10 0	- - -
Soil Pipe.....	17 0 0	- - -
ZINC—Sheet—		
Vieille Montagne..... ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet..... per lb.	0 1 0	- - -
Thin ..... ,,	0 1 1½	- - -
Copper nails..... ,,	0 1 1½	- - -
BRASS—		
Strong Sheet..... ,,	0 0 11	- - -
Thin ,, ... ,,	0 1 1	- - -
TIN—English Ingots..... ,,	0 1 3	- - -
SOLDER—Plumbers' ..... ,,	0 0 6½	- - -
Tinmen's ..... ,,	0 0 8	- - -
Blowpipe ..... ,,	0 0 9	- - -

[*See also page 171.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Laying-out Pleasure Ground	Aldershot U.D.C.	20*l.*, 10*l.* and 5*l.*	Mar. 1
*Proposed Public Offices	do.	100*l.*, 75*l.* and 50*l.*	Mar. 20
*New Town Hall	Harrogate Corporation	150*l.*, 100*l.*, and 75*l.*	May 14

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c, Supplied by	Tenders to be delivered
Police Station, Hurst, near Ashton-under-Lyne	.....	H. Littler, Architect, County Offices, Preston	Feb. 18
Surveyor's Materials	Bury (Lancs) Corporation	A. W. Bradley, Civil Engineer, Town Hall, Bury	do.
Two Cottages, Gelly Burn, Downfield	Dundee Water Commissioners	G. Baxter, Civil Engineer, 93, Commercial-street, Dundee	do.
Sewerage Works, shotley Bridge, Durham	Benfieldside U.D.C.	J. E. Parker, Civil Engineer, Post Office Chambers, Newcastle	do.
Concreting, &c, a Lake, Alexandra Park	Oldham Corporation	S. A. Pickering, Civil Engineer, Town Hall, Oldham	do.
Additions to House, Carlton, Skipton	Mr. J. A. Slingsby	J. Hartley, Architect, Skipton	do.
Two New Roads, Bordesley Green	Birmingham Corporation	City Engineer, Town Hall, Birmingham	do.
House, Brinton-terrace, Halifax	...	Walsh & Nicholas, Architects, Halifax	do.
Road Stone, &c.	Middlesbro' R.D.C.	W. H. Dixon, Surveyor, Kirby-in-Cleveland, Stokesley	do.
Sewers, &c., Hatherton-street	Walsall Corporation	J. R. Cooper, Borough Offices, Walsall	do.
House, Pitglassie, N.B.	.....	Duncan & Son, Architects, Turriff	do.
Bridge Works	Ilkley U.D.C.	Surveyor, Council Offices, Ilkley	Feb. 19
Auction Mart, Cornhill, Elgin, N.B.	Northern Auction Company, Ltd.	C. C. Doig, Architect, Elgin	do.
Sewerage Works, Donnybrook	South Dublin R.D.C.	T. J. Byrne, 1, James'-street, Dublin	do.
Road Stone, &c.	Stokesley R.D.C.	W. H. Dixon, Surveyor, Kirby-in-Cleveland, near Stokesley R.S.O	do.
Road Works, Moortown	Leeds Guardians	P. Robinson, Architect, 72, Albion-street, Leeds	do.
Additions to Baths, Main-street	Glasgow Corporation	J. Lindsay, City Chambers, Glasgow	do.
*Yearly Contracts	Borough of Hampstead	Borough Engineer, Town Hall, Hampstead	do.
Reading Room, &c., Abercanaid	Merthyr Tydfil U.D.C.	T. A. Rees, Town Hall, Merthyr	Feb. 20
Rebuilding Trevor Arms Inn, Penywern, Dowlais	.....	C. M. Davies, 112, High-street, Merthyr	do.
Additions to Hotel, Minstead, Hants	Messrs. Mew, Langton, & Company	Lemon & Blizard, Architects, Castle-lane, Southampton	do.
Twenty-four Villas, Dromalane, Newry, Ireland	.....	W. J. Watson, Architect, Benvenue, Rostrevor	do.
Sewers, &c., Harbledown, near Canterbury	Bridge District Council	A. Bromley, Engineer, Radnor Chambers, Folkestone	do.
Surveyor's Materials	Bebington (Cheshire) U.D.C.	T. Sproat, 5, Castle-street, Liverpool	do.
Sewers, &c., Short Heath, near Birmingham	Aston Manor U.D.C.	Surveyor, Council House, Aston Manor	do.
Broken Granite (5,732 tons)	Horncastle (Lincs) R.D.C.	J. E. Chatterton, Council Offices, Horncastle	do.
Retaining Walls	Radstock (Somerset) U.D.C.	G. H. Gibson, Surveyor, Radstock	do.
House, Seascale, Cumberland	Miss Hodgson	G. Boyd, Civil Engineer, 33, Queen-street, Whitehaven	do.
Sewerage Works	Criccieth (Wales) U.D.C.	M. Williams, Surveyor, Criccieth	Feb. 21
Alterations to Shops, Westgate &c.	Huddersfield Corporation	Borough Engineer, Town Hall, Huddersfield	do.
Well Sinking	Leamington Corporation	W. de Normanville, Civil Engineer, Town Hall, Leamington	do.
Alterations to Chapel, Garnfach, Nantyglo	.....	Rev. S. Bryant, Brynmawr, Wales	do.
Road Metal, &c, Northants	Hardingstone R.D.C.	J. Haviland, 2, St. Giles'-square, Northampton	do.
Rebuilding Bridge	Willenhall U.D.C.	F. E. Fellows, Civil Engineer, Town Hall, Willenhall	Feb. 22
Chapel, Pontardawe, Wales	.....	W. W. Williams, Architect, 63, Wind-street, Swansea	do.
Fencing Recreation Ground, at Cty. Schl., Pontypridd	.....	A. O. Evans, Architect, Pontypridd	do.
Pair Villas, Linden-road, Halifax	.....	A. G. Dalzell, Architect, 15, Commercial-street, Halifax	do.
Additions to Workhouse, Beeston-road	.....	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Sewerage Works, James, &c. Streets, New Tredegar	Holbeck Guardians	J. H. Lewis, Civil Engineer, Blackwood, Mon	do.
Additions to Schools, Ogmore Vale, Wales	Bedwellty U.D.C.	T. J. Thomas, Architect, Bridgend	do.
Boring	Llangeinor School Board	W. Wrennall, Engineer, 9, Harrington-street, Liverpool	do.
Paving Works, Eightlands-road	Leyland (Lancs.) U.D.C.	Borough Surveyor, Town Hall, Dewsbury	do.
Whinstone, &c.	Dewsbury Corporation	A. Stevenson, Road Surveyor, 14, Cathcart-street, Ayr	do.
Broken Granite, (1,200 tons)	Ayr Town Council	J. M. Simpson, Council Offices, Sibsey	do.
*Cleaning University College Hospital	Sibsey (Lincs.) R.D.C.	Hospital, Gower-street, W.C.	do.
Surveyor's Materials, Lewes	The Committee	F. J. Wood, Civil Engineer, County Hall, Lewes	Feb. 23
Workshops, Brunswick-terrace, Gateshead	East Sussex County Council	L. H. Armour, 16, West-street, Gateshead	Feb. 24
*Coarse Bacteria Beds	.....	Council's Engineer, Public Offices, Hendon, N.W.	do.
*Wrought-Iron Fencing and Gates, Oak Fencing, &c	Hendon U.D.C	Park's Department, 11, Regent-street, S.W.	do.
Alterations to Schools, St. Peter's, Cardiff	London County Council	James & Morgan, Architects, Charles-street Chambers, Cardiff	do.
Offices, Darlington	.....	W. T. Jones, 7a, North Bailey, Durham	do.
Granite and Slag (2,900 tons)	Weardale & Shildon Water Co.	R. Oakden, junr., Surveyor, Kirkgate, Newark	do.
Paving, &c., The Fairfield, Newcastle Emlyn, Wales	Newark R.D.C.	T. Thomas, Surveyor, Newcastle Emlyn	do.
Sewers, &c., East Morton	.....	H. M. Bullerfield, Civil Engineer, 3, Laythorpe-ter., East Morton	do.
Surveyor's Materials	Keighley R.D.C.	Borough Surveyor, Rawtenstall	do.
Road Materials	Rawtenstall (Lancs.) Corporation	E. T. Evans, Civil Engineer, Cardiff	do.
Water Supply Works, Thornton-in-Lonsdale	Penarth U.D.C.	T. A. Foxcroft, Town Hall, Settle	do.
Road Works, Merrow	Settle R.D.C.	J. Anstie, Surveyor, Commercial-road, Guildford	do.
Sewerage Works, Overbury	Guildford R.D.C.	H. A. Badham, Council Offices, Tewkesbury	do.
Two Storage Reservoirs	Tewkesbury R.D.C.	Shaw & Morton, Engineers, 128, Wellington-street, Glasgow	do.
Additions to School	Bathgate (N.B.) Town Council	T. H. Spencer, School Board Offices, Jarrow	do.
Sewerage Works, Minworth	Castle Bromwich U.D.C.	Wilcox & Raikes, Engineers, 63, Temple-row, Birmingham	Feb. 25
Additions to Schools, Kent-street, Portsea	Portsmouth School Board	A. H. Bone, Architect, Cambridge Junction, Portsmouth	do.
Street Works, Albert-street, &c.	Stanley (Durham) U.D.C.	J. Routledge, Surveyor, Council Offices, Stanley	do.
*Supply of Portland Cement	London County Council	Manager, Works Department, Belvedere-road, S.W.	do.
*Alterations to Sanitary Arrangements at Infirmary	Shoreditch Guardians	F. J. Smith, Architect, Parliament Mansions, Victoria-st., S.W	Feb. 26
Water Supply Works	Cannock (Staffs) R.D.C.	W. E. Rogers, Engineer, Anson-street, Rugeley	do.
*Road Making and Paving Works	Barnet U.D.C.	Council's Surveyor, 40, High-street, Barnet	do.
*Making-up Roads	Wood Green U.D.C.	Council's Surveyor, Town Hall, Wood Green	do.
*Supply of Road Materials and Works	do.	do	do.
*Annual Contracts	Hackney Borough Council	Council's Engineer, Town Hall, Hackney, N.E.	Feb. 27
*Rustic Thatched Refreshment Kiosk and Bandstand	Tonbridge U.D.C.	Council's Surveyor, Tonbridge Castle	do.
Drainage Works	Bognor U.D.C.	Council's Engineer, High-street, Bognor	Feb. 28
Water Supply Works, Leighton Buzzard	Lindsale U.D.C.	Sands & Walker, Engineers, Angel-row, Nottingham	do.
Cast-iron Pipes (260 tons)	do.	do	do.
Police Station, Helston, Cornwall	.....	O. Caldwell, Architect, Victoria-square, Penzance	do.
Annual Contracts (Road Materials)	St. Marylebone Council	Council's Engineer, Town Hall, Marylebone-lane, W.	Mar. 1
*Annual Contracts (Works and Materials)	do.	do.	do.
*New Custom House, Manchester	Commissioners of H.M. Works, &c	Collector's Office, Custom House, Manchester	Mar. 3
*Annual Contracts	Tottenham U.D.C.	The Clerk, 712, High-road, Tottenham	Mar. 4
*Artizans' Dwellings, City-road	Borough of Shoreditch	R. Plumbe, 13, Fitzroy-square, W.	do.
*Receiving Wards, &c., at Infirmary	Wandsworth & Clapham Union	Lansdell & Hamson, Architects, 65, Basinghall-street, E.C.	Mar. 5
Public Offices	New Maldon U.D.C.	Surveyor, 7, Market-place, New Maldon	do.
Paving Jubilee-street and Turner-street	Metropolitan Borough of Stepney	Borough Engineer, 15, Great Alie-street, Whitechapel, E.	Mar. 10
Electric Generating Station and Offices	West Ham Council	Borough Engineer, Town Hall, West Ham, E.	Mar. 11
Supply of Materials and Works	Hornsey U.D.C.	Council's Engineer, Southwood-lane, Highgate, N.	Mar. 12
Extension of Union Workhouse	Newmarket Union	Holland & Sons, Architects, High-street, Newmarket	Mar. 17
*Laying Sewers and other Works	Tewkesbury R.D.C.	Council's Clerk, Tewkesbury	Mar. 24
Public Hall, Forest Gate	.....	J. W. Acock, Architect, 14, Wormwood-street, E.C.	No date
Lecture Hall, Overton, near Morecambe	.....	A. Gorton, Architect, 24, The Crescent, Morecambe	do.
Additions to Imperial Hotel, Ballysannon, Ireland	.....	F. M. Lockwood, Architect, Bundoran	do.
Laying Water Pipes, Wortley, Sheffield	.....	Surveyor, Wortley Mineral Estate Office, Bank-street, Sheffield	do.
Villa, Castle Hagge, Kendal	.....	J. Stalker, Architect, Kendal	do.
Bakery, King Edward-street	Grimsby Co-operative Society, Ltd	Athron & Beck, Architects, Dolphin Chambers, Doncaster	do.

[See also next page.

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PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Quantity Surveyor	St. Pancras Council	Not stated	Feb. 19
*Clerk of the Works	Brynmawr School Board	2l. 10s. per week	Feb. 20
*Second Assistant Engineer	Metropolitan Asylums Board	T. Duncombe Mann, Offices of the Board, Embankment, E.C.	Mar. 3
*Temporary Assistants, County Surveyor's Office	Essex County Council	3l. per week each	No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. *Contracts, pp.* iv. vi. viii. x. xii. *&* xxii. *Public Appointments,* xvi. *&* xxii.

PRICES CURRENT (*Continued*).

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3½d. ,, ,,
,, fourths	3¾d. ,, ,,
26 oz. thirds	4¾d. ,, ,,
,, fourths	4¼d. ,, ,,
32 oz. thirds	5¾d. ,, ,,
,, fourths	5¼d. ,, ,,
Fluted sheet, 15 oz.	3¾d. ,, ,,
,, 21 ,,	4¾d. ,, ,,
¼ Hartley's Rolled Plate	2¼d. ,, ,,
⅜ ,, ,, ,,	2¾d. ,, ,,
½ ,, ,, ,,	3¾d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 8
,, ,, in barrels	,,	0 2 —
,, ,, in drums	,,	0 2 11
Boiled ,, in pipes	,,	0 2 10
,, ,, in barrels	,,	0 2 11
,, ,, in drums	,,	0 3 1
Turpentine, in barrels	,,	0 2 6
,, in drums	,,	0 2 8
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	,,	21 0 0
Best Linseed Oil Putty	per cwt.	0 8 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

P. H. P. (Below our limit.) A. W. B.—S. F. H. (Amounts should have been stated.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BALHAM.—For the erection of two shops and premises on the site of 279, Balham High-road, for Mr. H. W. Nightingale. Mr. Horace E. Rossiter, architect, 61 and 62, Chancery-lane, London. Quantities by Mr. Frederick G. Fletcher, 61 and 62, Chancery-lane, W.C.:—

	Stonework in Portland.	Saving if Bath Stone used.
F. and H. Higgs	£2,790	£18
J. Carmichael	2,588	20
J. A Bartram	2,538	48
Lathey Bros.	2,537	25
Garrett & Son	2,450	36
W. Lorden & Son	2,322	23
E. Triggs	2,200	23
H. Line*	2,136	30

* Accepted (using Bath stone) at £2,106.

CLONMEL (Co. Tipperary).—For sanitary improvements, &c., at workhouse. Mr. E. A. Hackett, engineer County Surveyor:—

	Section 1. Drainage.	Section 2. Water Supply.	Sections 3 & 4. Plumbing.	Sections 5 & 6. Building.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
J. & P. Goad	570 0 0	725 0 0	400 0 0	900 0 0
P. Blake	582 2 9	781 18 10	289 14 4	979 5 8
McGuire & Gatchell	591 17 0	789 14 5	354 19 1	—
T. & W. Little	433 10 6	731 8 2	294 10 9	919 3 4
Cleary & Co.	712 5 6	1,028 11 7	325 5 0	958 16 9
B. White	603 13 5	1,010 7 2	338 16 1	1,015 11 0
R. Costelloe, Waterford	*430 9 10	711 17 6	*280 2 1	—
Power & Son	—	770 6 7	278 14 8	—
Danl. Hayes	462 7 0	563 7 7	281 17 9	—
Wm. Baird	725 6 0	870 1 2	314 16 6	—
H. Bates, Clonmel	506 18 0	—	—	*905 16 7
Clure & Son	464 11 10	—	—	926 0 2
J. Hindry	—	—	282 18 8	—
J. Kennedy	474 17 4	818 17 7	340 6 3	1,093 6 3
Engineer's estimate	518 11 1	762 1 0	293 9 4	620 17 6

[Section 2, Water Supply, to be readvertised for tender.]

BOX (Wilts).—For alterations to Sunnyside, for Mr. D. G. Bingham. Mr. Harold Brakspear, F.S.A., architect, Corsham. Quantities by Messrs. Pinks & Watson, Parliament Mansions, Victoria-street, S.W.:—
Light & Smith £3,069 | H. Hoskings, Hungerford* £2,430
R. E. D. Rudman 2,870
Hayward & Wooster 2,543

BRADFORD (Wilts).—For the erection of new stable buildings at The Hall, for Mr. J. Moulton. Mr. Harold Brakspear, F.S.A., architect, Corsham. Quantities by Messrs. Pinks & Watson, Parliament Mansions, Victoria-street, S.W.:—
R. E. D. Rudman £2,127 | Hayward & Wooster, Bath* £2,080
E. Chancellor 2,120

CANTERBURY.—For the erection of sanitary conveniences, Burgate-street, for the Corporation. Mr. A. C. Turley, C.E., Tudor Chambers, Canterbury:—
A. J. Brewster £298 | H. J. Smith, Stonestreet, Maidstone* £244 18
C. Mount 290 19
W. J. Adcock 290 0

CHIPPENHAM (Wilts).—Accepted for erection of new residence, for Mr. Edwin Slade. Mr. Harold Brakspear, F.S.A., architect, Corsham. No competition:—
R. E. D. Rudman, Chippenham £1,993

CRUMLIN (Mon.).—For the erection of a house for Dr. Frost, Llanlulleth. Mr. R. L. Roberts, architect, Abercarn:—
M. Jenkins £689 0 | Davies Bros., Abercarn* £540 0
W. T. Morgan 612 10
Ellis Williams 547 10

DEVIZES.—For alterations to Brownston House for the Misses Milman. Mr. Harold Brakspear, F.S.A., architect, Corsham. Quantities by Messrs. Pinks & Watson, Parliament Mansions, Victoria-street, S.W.:—
Hayward & Wooster £2,666 | R. Rudman, Chippenham* £2137
Light & Smith 2,318
H. Hoskings 2,150

HATFIELD.—For the erection of new infirmary for women at the workhouse, for the Hatfield Union. Messrs. Chas. Smith & Son, architects, Reading:—
Stephens, Bastow, & Co., Ltd. £2,801 0 0
Perry Bros. 2,650 0 0
Chas. Jackson 2,620 1 6
John Appleby 2,534 0 0
Gen. Builders, Ltd. 2,431 0 0
Coulson & Lofts 2,415 0 0
S. Redhouse, sen. 2,377 4 9
W. M. Butcher 2,372 16 4
Wm. Howard 2,345 15 0
Miskin & Sons 2,343 0 0
Wm. French 2,313 4 3
Dupont & Co. 2,275 0 0
Willmott & Sons 2,255 0 0
Hardy Bros. £2,252 0 0
Viney & Stone 2,214 0 0
F. G. Minter 2,207 0 0
Maple & Co. 2,187 0 0
Norris & Son 2,180 0 0
Mussellwhite & Son 2,177 0 0
G. Jackson 2,167 0 0
T. H. Coleman 2,146 0 0
Wm. Wade 2,130 0 0
Ekins & Co. 2,103 0 0
Wilkinson Bros. 2,096 0 0
W. G. Dunham 2,066 10 0
Sam. Worboys, Potter's Bar, Middlesex* 2,063 0 0

HAVERHILL (Suffolk).—For the erection of house, offices, and stores, High-street, for Messrs. Greene, King, & Sons, Ltd. Mr. A. Ainsworth Hunt, architect, Sudbury. Quantities by Mr. E. Underwood, 3, Queen-street, Cheapside, London:—
Coulson & Lofts £2,086 | Mason & Sons, Haverhill* £1,783
Kerridge & Shaw 1,900
C. Runnacles 1,897

HULL.—For additions to schools, Chapman-street, for the Kingston-upon-Hull School Board. Messrs. Gelder & Kitchen, architects, Lowgate, Hull:—
lackburn & Son, Carlyle-street, Hull £3,785

ILFORD.—For the erection of dwelling-house and stabling, Ley-street, Ilford, for Mr. E. E. Wood. Mr. Horace E. Rossiter, architect, 61 and 62, Chancery-lane, London:—
W. Lloyd £886 17 | Cole & Mundy* £879 0

ILFORD.—For the erection of dwelling-house, Auckland-road, Ilford, for Mr. J. Mumford. Mr. Horace E. Rossiter, architect, 61 and 62, Chancery-lane, London:—
J. Leggett £640 | J. A. Bartram* £560
Cole & Mundy 570

ILFORD.—For alterations and additions to No. 8, Brisbane-road, for Dr. Albert Smith. Mr. Horace E. Rossiter, architect, 61 and 62, Chancery-lane, London:—
Cole & Mundy* £250

LONDON.—For a new block of workmen's dwellings in Northwold-road, Stoke Newington. Mr. R. Langton Cole, architect:—
Dore Bros. £6,855 | Colls & Sons £6,647
Woodward & Co. 6,840 | Clarke & Bracey* 6,393
Lawrance & Sons 6,695

LONDON.—For the erection of a new police-court at Westminster, for the Metropolitan Police. Mr. J. Dixon Butler, Police Surveyor:—

	Credit. £	£
Foster & Dicksee	75	16,692
Lascelles & Co.	20	14,990
Willmott & Sons	—	14,200
Lathey Bros.	40	13,989
Leslie & Co.	20	13,960
H. Lovatt	100	13,650
Shark, Patrick & Son	—	13,490
Higgs & Hill	50	12,914
Holloway Bros.	40	12,050
T. Parker	—	12,885
Grover & Sons	55	12,795
H. J. Williams	—	12,500
C. Ansell	140	12,311
Lawrance & Sons	70	12,399
Ashby & Horner	40	12,060
F. F. H. Higgs	75	11,973

LONDON.—For the erection of a manager's house, 3, Mill-lane, Bromley-by-Bow, for Messrs. Kemball, Bishop, & Co., Ltd. Messrs. Wigg, Oliver, Hudson, & Co., architects, 80, Leman-street, E. Quantities by Messrs. Stanger & Son:—
G. E. Weston £1,315 | Sparks & Sons £1,075
Snewin Bros. & Co. 1,189 | Lark & Son 1,074
Hawkey & Oldman 1,126 | F. & F. J. Wood 1,000
J. & H. Cocks 1,093 | Johnson & Son 997
Chapen & Newman 1,038 | Shurmer & Son 994
Oulthwaite & Co. 1,097 | Wilkinson Bros. 927

LONDON.—For the erection of new offices and caretaker's lodge, 3, Mill-lane, Bromley-by-Bow, E., for Messrs. Kemball, Bishop, & Co., Ltd. Messrs. Wigg, Oliver, Hudson, & Co., architects, 80, Leman-street, E. Quantities by Messrs. Stanger & Son:—
G. E. Weston £2,471 | Snewin Bros & Co. £2,193
J. & H. Cocks 2,382 | Lark 2,190
Chafen & Newman 2,346 | F. & F. J. Wood 2,190
Hawkey & Oldman 2,320 | Wilkinson Bros. 2,000
Outhwaite & Co. 2,267 | Shurmer & Co. 1,995
Sparks 2,250 | Johnson & Sons 1,990

[See also next page.

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MERTON PARK (Surrey).—For a small house in Dorset-road. Mr. H. G. Quartermain, architect, Merton:—

Burgess & Sons, builders, Wycliffe-road, Wimbledon*..... £985

NATLAND (Westmorland).—For the execution of waterworks for the South Westmorland Rural District Council. Mr. Wm. Harrison, engineer, 1, Hind-street, Preston:—

Tank and Pipelaying.

William Carradice, Fellside, Kendal..... £344

Irregular Casings.

Blakeboro, Brighouse, Yorkshire 24

PAIGNTON (Devon).—For execution of Waterworks, &c. (Contract No. 2), for the Urban District Council. Mr. Fred. Wm. Vanstone, engineer, Paignton. Quantities by engineer:—

Gill & West	£58,245 5 9	Jones & Sons	£39,018 7 1
A. N. Coles	55,399 0 0	J. Dickson Dunsford	38,286 19 8
S. Saunders	45,645 0 0	J. H. Vickers	37,428 7 9
W.C.Shaddock	45,380 1 0	J. C. Lang	37,404 11 1
C. T. Perkins	45,074 17 0	Pethic Bros.	37,363 0 0
A. Jenkins	42,334 15 8	Cooke & Co.	37,107 14 7
Westminster Construction Co.	41,196 0 0	Hawking & Best	34,971 11 0
E. R. Lester	40,498 0 0	C. Brealy	34,905 0 0
Stephens & Son	39,742 0 0	Dart & Pollard	33,950 14 9
J. & F. Binns	39,232 5 4	Gresenthwaite & Newton Carlisle*	33,327 0 0

PARSLOES PARK (Dagenham).—For the erection of twenty loose boxes, and alteration and additions to stand and enclosures, for the Essex Amateur Trotting Club. Mr. J. M. H. Gladwell, architect, Boston House, 63 and 64, New Broad-street, E.C.:—

W. Cooper, Ltd.	£834 0	F. Smith & Co.	£605 0
A. E. Symes	645 10	Croggon & Co. (stabling only)	437 10
C. G. Finegan	613 10		

PENARTH (Wales).—For the erection of a hospital for infectious diseases, Llandough, for the Urban District Council. Mr. E. T. Evans, C.E., Arcade-buildings, Penarth:—

Contract No. 1.

Beames & Nephew	£2,262 14 7	B. T. Pomeroy	£1,733 2 5
J. Allen	2,108 4 7	D. G. Price	1,690 0 4
Evans & Bros.	1,917 17 9	J. Prout	1,634 11 0
Jones & Sons	1,875 0 0	W. Britton	1,572 8 4
T. Rees	1,851 17 10	Lloyd & Tape	1,521 11 5
J. E. Evans	1,769 7 11	T. Bevan, Albert-road, Penarth*	1,443 0 0

Contract No. 2.

J. E. Evans	£6,000 0 0	J. Prout	5,285 0 0
J. Blight	5,984 18 2	W. Britton	5,123 6 3
J. Bickford	5,752 10 6	Thomas & Son	5,103 0 0
Beames & Nephew	5,522 13 4	D. G. Price	5,091 2 1
J. Allen	5,516 3 6	T. Bevan, Albert-road, Penarth*	4,927 12 0
Jones & Sons	5,309 10 0	Lloyd & Tape	4,779 14 7
Evans & Bros.	5,308 18 8		

PURLEIGH (Essex).—For the erection of a bridge for the County Council. Mr. P. J. Sheldon, C.E., County Offices, Duke-street, Chelmsford:—

J. Rayner	£771 16	Smith & Son	£573 0
S. Parmenter	579 0		

SNARESBROOK (Essex).—For alterations to the Cuckfield Hotel, for Mr. F. D. Wymer. Mr. J. M. H. Gladwell, architect, Boston House, 63 and 64, New Broad-street, E.C.:—

Evans, Jones, & Co. £537

STONEHAVEN, N.B.—For the reconstruction of the parish church, Dunnottar. Mr. Y. P. K. Young, architect, 42, Tay-street, Perth:—

Masonry.—Smith & Co., Stonehaven, N.B.	£1,124 4 10
Joinery.—Thomson & Sons, Stonehaven, N.B.	990 0 0
Plumbing.—E. Pithie, Stonehaven, N.B.	75 13 7
Plastering.—J. Valentine, Stonehaven. N.B.	110 1 6
Slating.—R. Burness, Stonehaven, N.B.	90 0 0
Glazing.—Mason & Son, Aberdeen	48 9

WOLVERHAMPTON.—For the execution of street works, Upper Villiers-street, &c., for the Corporation. Mr. George Green, Borough Engineer, Town Hall, Wolverhampton:—

Jas. Owens	£1,609 3 10	H. Holloway, Wolverhampton*	£1,527 13 1
W. H. Reading	1,552 10 3		

WREXHAM.—For the erection of depôt premises, for the Town Council:—

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Davies Bros.	512 18 0	G. Cathrall*	402 0 0

[All of Wrexham.]

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The Builder.

VOL. LXXXII.—No. 3081. FEBRUARY 22, 1902.

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Part of Drawing-room, Brocklesby Park ..... Mr. Reginald Blomfield, F.S.A., Architect.
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Private and Public Water Supply.

LIKE the poor, the water question is always with us. From the metropolis to the smallest rural district, there are few places where it is not, even at the present day, a matter of the most urgent importance. The drought of last summer awakened many authorities to the fact that, in view of the increase of population, existing supplies are in many cases inadequate, and that fresh sources must be tapped or new mains laid without delay, in order to prevent a water famine in the near future. Manchester is preparing to lay a new main from Thirlmere to bring an additional twelve million gallons daily to the city; Liverpool is bringing an additional supply from Lake Vyrnwy; Halifax and many other towns are constructing new reservoirs, because their existing waterworks will soon be strained to their utmost capacity. London alone among the large centres of population makes no progress. The wise men who are taking thought for the morrow are like voices crying in the wilderness. Ever since the London County Council was formed, the water question has been the subject of eager discussion, but vested interests and an apathetic Government have thwarted the expressed wishes of the citizens. Whether the present Session of Parliament will merely witness a repetition of the already oft-repeated fiasco of Bill introduced and Bill withdrawn or rejected, or will see some definite step taken towards the provision of a larger and purer supply, no one can say; but there can scarcely be two opinions as to the urgency of the question, in view of the rapid growth of the population and the sources of the present supplies.

It is true that the London water question has been considered by Royal Commissions, by Committees of the House of Commons, by the London County Council, and by many experts, but the last word has not yet been spoken on the subject, and it is interesting and instructive to note the opinions of any persons who are qualified to speak with authority. Dr. Rideal, in the second edition of his valuable work on "Water and its Purification,"* has a good deal to say on the subject incidentally, and what he says is worth careful consideration. In the first chapter, which has been almost entirely rewritten, he points out that rivers are "to a certain extent" purified by the deposition of suspended particles in the quieter tracts of their flow, but adds that "the silt or sediment is apt to be again raised by an unusual current, causing 'storm-water' to be always more or less turbid, as is seen at intervals in many of the London supplies derived from the Thames." The dangerous nature of this storm-water is attested on page 118, where we read—"Dr. Shirley Murphy has shown that in 1894 sporadic cases of enteric fever occurred in London after the delivery of inefficiently filtered Thames water when the river was in flood in the late autumn." In the district of St. George's, Hanover-square, twenty-nine cases were notified in November and December, and only fourteen in the three previous months, when the seasonal prevalence of the disease usually takes place.

Every one knows that the Royal Commission of 1892 gave a valuable testimonial to the London Water Companies: "We are strongly of opinion that the water, as supplied to the consumer in London, is of a very high standard of excellence and of purity, and that it is suitable in quality for all household purposes." It is true that this glowing eulogy was somewhat tempered by a later paragraph, in which the Commissioners expressed their belief that there is no danger of the spread of disease by the use of this water, "provided that there is adequate storage, and that the water is efficiently filtered before delivery to the consumers." Dr. Rideal falls foul of this Report. On p. 123 he declares that "the highest medical and scientific opinions are practically at one in stating that the drinking water of a populous town ought not to be taken from rivers running through cultivated and inhabited lands." Then follows this home-thrust: "No fewer than three of the members of the recent Royal Commission were examined as experts on the Birmingham Water Bill in 1893, and they all expressed this view with more or less emphasis." He also points out—what is well known—that most of the London companies "supply at intervals, and invariably at times of flood, water that is more or less turbid, and therefore has not been efficiently filtered." The obvious conclusion is drawn that if visible suspended matter has passed through the filters, "the more subtle bacteria may also certainly penetrate." In an appendix dealing with some recent epidemics connected with water supply, Dr. Rideal asserts that in times of flood the Thames and the Lea "become turbid and charged with the filth of all the districts drained; then, nothing but efficient filtration stands between London and water-borne disease." He makes light of the argument that, because disease germs have not been detected in the filtered water, this water is invariably safe. At the best, such evidence is merely negative, and against it he declares that "bacilli of the *coli* group, at least some of which are probably pathogenic, have been repeatedly found in the water supplied by certain companies."

Some improvement in existing supplies would probably result if effective control were exercised over the water companies, but in the present state of the law this is impossible. The London County Council is almost powerless in the matter; it has no right to inspect the waterworks, much less to stop a supply, however turbid it may be. Dr. Rideal appears to have little hope of benefit accruing, even from legislation of this kind. "With all precautions," he writes, "London cannot be considered secure while drawing from polluted rivers. 'Our only real safety lies in selecting a pure supply, and in keeping it so.'"

Although it is not stated in definite

* "Water and its Purification": A Handbook for the use of Local Authorities, Sanitary Officers, and others interested in Water Supply. By Samuel Rideal, D.Sc. (Lond.), F.I.C., Examiner in Chemistry to the Royal College of Physicians, &c. Second Edition, Revised and Extended. London: Crosby Lockwood & Son. 1902.

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language, there can be no doubt that Dr. Rideal is in favour of supplying London with water from Wales. The quotations we have already made show that he is firmly convinced that the impurity of the water received by the companies is a continual source of danger. He has, however, very littl to say of the probable deficiency in quantity in the near future. "The observed progressive shrinking of the Thames" is, indeed, mentioned, but more might with advantage have been said on this important question of quantity. More water is urgently required for the flushing of sanitary fittings and for other purposes, and provision for the ever-growing population must be made without delay.

Dr. Rideal's remarks on the London water question are, however, merely incidental. They are interesting as being the deliberate opinions of a man well qualified to speak on the subject, but they constitute a very small portion of his able book. Dr. Rideal is above all things a chemist, and naturally he writes from the point of view of a chemist and bacteriologist and not from that of an engineer. The first three chapters are devoted to a consideration of different kinds of waters, their characteristics, dissolved and suspended matters, animal and vegetable impurities, &c. The next treats of springs and wells, and contains four pages (including illustrations) on the divining rod; the author is evidently preserving an open mind on this much-discussed method of searching for water, and advances an argument from analogy, which, like all arguments of the sort, has little but plausibility to recommend it—"just as the magnetic needle moves towards iron always, but towards copper only when carrying a galvanic current, a fact which we cannot really explain further than by calling it a 'property' of iron, so it is perfectly possible that a rod in the hands of a specially sensitive individual may move under the 'induction' of running water." For "running water" we may substitute iron ore, auriferous quartz, or rabbits without vitiating the argument. Of course, no one denies that water has been found in innumerable cases under the direction of a dowser, but in many districts the difficulty would be for him to find a place under which water cannot be found. Dr. Rideal gives much useful information on springs and wells, perhaps the most interesting being that on testing for the source of the water. Among the soluble substances used for this purpose common salt is the cheapest, but lithium chloride is also used. These, however, cannot be detected by the eye or taste alone, and fluorescin ($C_{20}H_{12}O_5$) is recommended as the best colouring agent; it is an orange dye with a very strong green efflorescence, and is easily visible when diluted with many thousand times its weight of water; indeed, it is said that an entire river may be coloured by a few kilogrammes. As, however, it gives a colouration in alkaline liquids only, soda should be added with it. Commoner dyes are often used, but as many of these are more or less poisonous, they are not suitable for drinking water, or for streams containing fish.

It is commonly said that a cesspool ought not to be constructed within 100 or 200 ft. of a well. Dr. Rideal quotes instances of pollution in wells from distances of 500 yards, and states that the distance of possible pollution has been found by experiment, in the case of "surface wells," to vary from 15 to 160 times the amount of depression.

Rivers, as sources of water supply, are considered in chapter V., and the conclusion is reached that such water should not be used for domestic purposes "if it can be avoided." The following chapter, entitled "Storage," deals with lakes, reservoirs in upland districts, and service reservoirs near the area of distribution. Dr. Rideal concludes that the only waters which deteriorate on storage are those which have been filtered or taken from subterranean sources; the reservoirs for such waters ought to be covered. The possible sources of pollution in distributing mains and in service cisterns and pipes are considered in a separate chapter. Various methods of coating lead and iron pipes are briefly described, and the author states that "so-called linings of pure tin have been found on analysis to consist of an alloy of equal part tin and lead." The danger of lead poisoning is referred to, but no royal road to prevention is shown. There can be no doubt that the only satisfactory method is to compel the water authorities to treat the water in bulk before supplying it to the consumer. In most provincial towns the water authority is also the sanitary authority, and in its latter capacity exercises the power of condemning injurious or dangerous private supplies; if the public supply contains organic acids which act on lead, it may be as injurious as the private supply which has been condemned. Perhaps the best remedy for this state of affairs would be for Parliament to compel every water authority to supply water free from injurious or dangerous matters. In other words, the Food and Drugs Act might with advantage be extended to include the most important of all foods—water.

The subject of "purification on a large scale" is dealt with at considerable length; among the methods described are natural subsidence in reservoirs, chemical and mechanical precipitation, sterilisation by heat and by chemicals, and filtration through sand and other materials. The whole subject is treated in the main from the chemical and bacteriological point of view, but some practical details are given—particularly in the case of sand-filtration—which will be of direct service to the engineer. Household filtration is less fully dealt with; following all recent authorities on the subject, Dr. Rideal condemns the common types of household filters, and adduces evidence to show that the Pasteur (Chamberland) filter is the only one which has proved itself satisfactory under experimental and practical working. The excessive mortality of our troops in South Africa from enteric fever is attributed in a large measure to the defective type of filter employed. This is probably true, but we doubt if even the best filter would have been as effective as sterilisation by chemicals. Professor Notter's experiments with bromine showed clearly that quantities so minute as to be harmless to human beings were sufficient to destroy typhoid germs in a few minutes. Tabloids of bi-sulphate of soda can also be used, as recommended by Dr. Rideal and Dr. Parkes, but are not quite so rapid in action. Such tabloids are very convenient and portable; 350 tabloids, sufficient for nearly sixty quarts of water, weigh only 4 oz. Mobile columns can scarcely be expected to carry porcelain filters in sufficient quantity to be of service, but every soldier could easily carry 4 oz. of tabloids, and the supply could be replenished without much difficulty.

Processes for softening water on a large scale are described at some length, and manufacturers' blocks are introduced to illustrate the most important kinds of apparatus. It has been estimated that a farthing's worth of lime expended in softening hard water saves about thirty shillings' worth of soap, and no better proof of the value of the process need be given. Hard water also has serious effects on steam boilers and on domestic boilers. Dr. Rideal distinguishes between the different kinds of hard water, and gives the results of analyses to show the improvements effected by various processes.

The final chapter deals with the interpretation of the results obtained by chemical and bacteriological analyses, and is of particular interest to the non-professional reader. An appendix of fifty pages contains accounts of recent epidemics connected with water-supply, and tabular statements of analyses of water and boiler incrustations, water-bearing strata, &c. A full index completes the volume. We have said enough to show that Dr. Rideal's book is both interesting and instructive. Although not written expressly for architects or engineers, it contains matter which cannot fail to be of great service to them, and certainly every medical officer of health ought to possess a copy.

NOTES.

The Institute and the Law of Light.

In an article upon the Law of Light which was published last week, we referred to the fact that the Institute of Architects and the Institution of Surveyors have not yet made any effort publicly to obtain legislation upon the lines of the report of the Committee appointed in 1900, but from the letter of the Chairman of the Joint Committee, in another column, it will be seen that the subject is not being neglected. It is to be noted that Mr. Fletcher Moulton, who was one of the members of the Committee, is a member of the House of Commons, and it would therefore be the easiest thing in the world for the Bill to be introduced by him. We have before expressed our opinion that legislation on the rather drastic lines of that report will not be successful, but a modified measure might be piloted through the House of Commons; at any rate, the discussion of such a Bill would indicate public opinion on the subject, and it is only by the backing of public opinion in some form or other that any measure can now be successful. The bankers long ago obtained a code of the law of bills of exchange, and the pressure of the mercantile community this year compelled the Lord Chancellor to introduce a Bill for the codification of the law of marine insurance. It would be surprising if architects, surveyors, and builders cannot, if they are united, obtain the same success in regard to a measure codifying and improving the Law of Light.

Women as Architects.

We are glad to see from the opening paragraph of Miss Charles's paper at the Architectural Association, printed on another

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page, that the subject, "A Plea for Women Practising Architecture," was not of her own choosing (which we presume means that she was asked to read a paper on that particular subject); as this consideration saves us from the disagreeable task of having to criticise a lady. We think the choice of subject quite a mistake. No good is ever done, that we can see, by papers and speeches about what women can do and what men can do; they prove nothing, and they tend to lead to recriminations and *tu quoques* between the opposite sexes which are as well avoided. The question whether a woman can practise as an architect is one of the class of questions of which it may be said, *solvitur ambulando*. If a woman, at the present day, has properly learned one of the professions which men usually practise, there is no power whatever in any one to hinder her from practising it; she has no need to ask any one's permission; and therefore it is waste of time to argue the point. We should have much preferred to have heard Miss Charles read a paper on some purely architectural subject, her treatment of which would in itself have shown her architectural capacity, without introducing any controversy on the subject of Woman *versus* Man. Taking the paper for what it was, we think Miss Charles's arguments were mostly quite logical, but that two of her imagined objections to women practising architecture are imaginary only. The parallel between women architects and the women chain-makers was not to the point, because the practice of architecture does not in any special way demand physical strength; and the objection that women could not swear at contractors, if seriously put, is also a very imaginary objection. As a rule, architects do not use strong language to contractors; and if any say they have to do so, we should be disposed to think it is their own fault for not having been able to command respect by their ordinary manner. However, we hope that on another occasion we may have an architectural paper from Miss Charles on some subject quite apart from the present controversy.

The Church Crafts League.

WE give a brief report in another column of the last meeting of the Church Crafts League, in respect of which we must say that—with all sympathy with the general object of the League, which is to get the work of genuine artists into churches instead of the "ecclesiastical art" of trading firms—we think their ideas about the way to set about decorating a church need a good deal of revision, and are not likely to recommend them to architects. One speaker at the meeting (Mr. Holroyd) observed that in the fifteenth century it was the custom for a wealthy family to make themselves responsible for one part of the church, and employ the best artist they could find to carry it out; and Mr. Selwyn Image protested against the idea that one man must be responsible for all the decorative work of a church, and said that "if real artists were employed they would all be actuated by the same spirit, and the result would not be lacking in unity of purpose." The best answer to this is to refer the speakers to the Panthéon at Paris, where painters who were all "real artists" but with totally different styles and aims, have been allowed each to do what he liked with a portion of the church in his own; with the result of producing, in a decorative sense, an absolute medley, totally at variance with the general character and expression of the architecture. The reasoning employed is false, because in the fifteenth century in Italy there was much less individualism in painting than there is now, and a church might be decorated in this piecemeal way without producing very violent contrasts. The case is far otherwise now. A single chapel, more or less cut off from the rest of the church, may be decorated by a single artist in his own way, without reference to the rest. But an architectural interior as a whole must, if decorated, be decorated with a unity of style which cannot be secured except under one directing mind; and the decoration must be subordinate to the architectural scheme. Apparently some of the members of the Church Crafts League regard the church only as providing so many spaces for them to decorate each in his own way. In that case we think architects will be wise to keep clear of them.

Water Power in Ireland.

THE paper read by Mr. Tatlow last week before the Dublin Local Section of the Institution of Electrical Engineers on "Irish Water Power and its Electrical Development," calls attention to the fact that water power of considerable value exists in the country, and that the time has now arrived when a careful survey of this power should be made in view of its use for industrial purposes. It is pointed out that, owing to the fact that electric lighting has hitherto been the most important of the electrical industries, the value of this water power has been underestimated. In electric lighting the demand for power is only for a few hours per day, and hence the cost of the fuel necessary when steam is used is only about 30 per cent. of the total costs of the station. For the electro-chemical industries, however, where a steady load is required for the twenty-four hours, water-power plant is very much more economical than steam. Of the 166,000 horse-power expended on electro-chemical work on the Continent 149,000 is obtained from water-power. Mr. Tatlow gives data about numerous places where hydraulic power stations could with advantage be constructed, and we think that the cheap water-power would enable electro-chemical factories to be worked profitably in Ireland.

Windsor Castle.

MANY of our readers, both architects and archæologists, will be interested to hear that Mr. St. John Hope has received the King's command to write the architectural history of Windsor Castle. Mr. Hope has been collecting materials for some years, and we have no doubt the result of his labours will be a work of great value and interest.

The New Stamps.

THE designs for the new postage stamps, so far as issued, certainly do not show any justification for the fact of the Government having gone to a foreigner for their design, considering that England possesses at this moment better decorative designers than any other country. Herr Füchs's inspiration seems to have been exhausted in the first design, which is used for the ½d., 1d., 2½d., and 6d. stamps, only printed in distinctive colours (if the 6d. one can be called a colour at all). This is a simple and good design, with the King's head in a circle bordered by a laurel wreath on the left side and an oak wreath on the right side; the crown at the top. This is suitable and in good taste. The 1½d. stamp, on the other hand, is a very bad design, with no character whatever and in a totally different style from those already mentioned—or rather, no style whatever. The 3d. stamp (yellow) is somewhat better, but is also quite out of keeping with the first design, and very commonplace in detail. Why could not the Government have gone to an artist like Mr. Walter Crane to design the stamps? We should then have had a set of good designs all in the same school. As it is, the results suggest that some one without much notion of design has been trying experiments. Are the 1½d. and 3d. stamps really by the same hand as the others? They do not look like it.

An Italian Water Supply Scheme.

THE *Ingéneria Moderna* publishes an account of the great scheme about to be discussed in the Italian Chamber of Deputies for a main service water-supply in the extreme south-eastern corner of the peninsula. "The general project proposed by Government is divided into five principal parts:—First, a connexion between Caposele and the three provinces of Foggia, Bari, and Lecce; second, a common conduit to the two latter districts; third, a separate conduit for Foggia; and fourth and fifth, similar conduits for Bari and Lecce. In connexion with these five principal divisions will be sixteen subordinate projects. The general estimate amounts to 163,000,000 fr. (6,520,000*l.*) for the work exclusive of the means of distribution into buildings, but comprising the local reservoirs and their communications with the centres of habitation. The expenditure, divided according to provincial requirements, will be:—Foggia, 25,577,000 fr.; Bari, 59,639,124 fr.; Lecce, 77,763,670 fr. The general plan of the aqueduct commences at the springs of Caposele, crosses the Apennines at the pass of Conza with a tunnel of 127 metres, from which point it follows the valley of the Ofanto for a distance of 49,178 km., with a constant fall of 1 in 40. Here the junction is made for Foggia, comprising an open canal of 69,610 km. length with 291,350 km. of piping and twelve reservoirs for twenty-one inhabited centres. From the junction for Foggia the main aqueduct is carried towards Bari for a distance of 213,429 km., with fifteen branches and forty-one reservoirs to supply fifty-six centres. For the province of Lecce a principal canal, 17,881 km. long, with 649,453 km. of secondary communications, will supply thirty-four reservoirs for 141 inhabited centres. The total project comprehends 262,607 km. of principal canal and 1,398,251 km. in the branches. The principal canal is expected to pass through 58,902 km. of tunnelling, 188,051 km. in trenches, 6,873 km. on bridges and arches, and 8,779 km. in metal siphons."

Electrical Traction on Railways.

THE paper on "Electrical Traction on Railways," by Messrs. Morley and Jenkin, attracted a crowded audience to the Institution of Civil Engineers last Tuesday. In

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the recent arbitration case as to which of two systems should be adopted for the "Inner Circle" line of the Metropolitan and Metropolitan District Railways, so many problems were raised in connexion with the development of electrical traction in the railways of the country that general interest has been aroused in this branch of engineering. The authors began by giving a general review of the principal systems of electrical traction, and they discussed their respective merits for general railway work. An impartial *résumé* was given of the various direct current and alterna ing current systems. Great stress was laid on the importance of the Ward-Leonard method of working railways by single phase alternating current. The locomotive carries an induction motor which gets its current by the ordinary trolley pole; this motor drives a direct current dynamo, which in turn actuates a direct current motor geared to the driving wheels. In fact, instead of having sub-stations along the line the locomotive carries a sub-station. The beauty of the system is that all the operations of starting, reversing, braking, and returning energy to the line when stopping or coasting, are done by merely adjusting the excitation of the field magnets of the dynamo. The question that has to be decided is whether the advantages offered are sufficient to make it advisable to carry on the train three times the amount of machinery actually necessary to drive it. The authors consider that this system compares favourably with either the direct or the polyphase. In the subsequent discussion Lord Kelvin said that it was no chimerical optimism to suppose that long railway lines could be worked electrically as successfully in the future as short lines had been worked in the past, but he thought that the authors were a little too positive in saying that supply at constant pressure was the only practical way. He recalled how Messrs. Siemens had proposed a constant current system twenty years ago, and suggested that possibly this idea might be worth developing. He was struck by the magnitude of the "skin effect" in iron rails carrying alternating current. Lord Kelvin concluded by thanking the authors for their most valuable and suggestive paper.

The Electrical Properties of Iron.

LAST week Professor Barrett read an abstract of his paper on "The Electrical Conductivity and Magnetic Properties of Upwards of One Hundred Different Alloys of Iron" to the Institution of Electrical Engineers. Professor Barrett and his colleague, Mr. W. Brown, have been engaged for several years past in making an investigation of the physical properties of an extensive and unique series of alloys of iron prepared by Mr. Hadfield, of the Hecla Steel Works, Sheffield. The results they have arrived at are of great value, and some of them have been already published in the "Transactions" of the London and Dublin Royal Societies. They have found out that the addition of even a small amount of carbon or aluminium to iron makes it a very bad conductor of electricity. This has been utilised in the manufacture of wire-resistances for dissipating heat, the wire being an alloy of iron called "resista," which is now well known to electricians. The latter part of the paper deals exclusively with the magnetic properties of these alloys, and Professor Barrett has made some important discoveries. He finds that mechanical hardness and magnetic hardness go hand in hand, and that by suitably tempering steel its magnetic retentiveness can be increased. He also finds that the addition of a very small amount of manganese makes iron practically non-magnetic. Hence it is possible to make steel ships non-magnetic, but the cost would probably be prohibitive. We think that this discovery will be of great value to watchmakers, as they will be able by its means to make non-magnetisable watches as accurate timekeepers as ordinary watches at no increased cost. The most valuable discovery of Professor Barrett is that by adding 2½ per cent. of aluminium to iron we obtain an alloy whose magnetic qualities are decidedly better than the original iron. He showed a rod of this alloy so susceptible to magnetism that the mere magnetising force of the earth made it a powerful magnet, the polarity of the poles being reversed every time it was turned through 180 deg. in the earth's field. In the subsequent discussion Lord Kelvin pointed out that this alloy could be usefully employed in the core of the alternating current transformer, as the great diminution in the core loss would increase its efficiency. Dr. Glazebrook showed the importance of microscopic research in connexion with these alloys, and stated his willingness to continue Professor Barrett's researches at the National Physical Laboratory at Bushey House.

The Hull Town Hall Question.

MR. J. H. HIRST, the city architect of Hull, writes to say that his department is entirely separate from that of the city engineer; he is city architect, and carries out the architectural work, and the city engineer carries out the work of his own department. We presume Mr. Hirst meant that we were inaccurate in using the expression city surveyor, and that he is architect and not surveyor. But we do not see, nevertheless, that the people of Hull should be contented with having a new Town Hall carried out by the official architect any more than we in London are content to have a Government building carried out by the Office of Works.

Belsize Park Estate, Hampstead.

THE fifty houses on this estate of which the leases for terms ranging from fifty to sixty-one years unexpired were offered for sale last week, were erected upon the property appertaining to Belsize House, which was laid out for building purposes about forty years ago. The estate had belonged to Armigell Waade, Clerk of the Council to Henry VIII. and Edward VI., and a famous voyager, for whom some claim the first discovery of the South American Continent. He died on June 20, 1568, and was buried in the chancel of the old parish church, Hampstead. His son, Sir William, succeeded him as Clerk of the Council to Elizabeth and James I. Early in the eighteenth century Belsize House and the grounds became a favourite resort as a place of outdoor amusement, and an advertisement of its attractions, issued in 1720, announces that "For the security of the guests there are twelve stout fellows, completely armed, to patrol between London and Bellsize to prevent the insults of highwaymen and footpads." The gardens were closed and the house was rebuilt about fifty years afterwards; a view of the old house, taken from a contemporary print, is published in our columns of December 11, 1875. In our volume for 1853 will be found a plan of Professor Cockerell's scheme for a northern park, traversed with a ride or boulevard 300 ft. wide, and extending to Belsize and Hampstead, from Albert-road, Regent's Park, sweeping over Primrose Hill to the Eton College Estate and Belsize, and so by the avenue of elms (now Belsize-avenue) to Hampstead Green, thence by Parliament Hill to the Spaniards, near the Heath, and so round by North End and Telegraph Hill to Jack Straw's Castle. Belsize House, at one time the home of Spencer Perceval, stood on the site of the present Belsize-square, and near St. Peter's Church.

Syon Park House, Isleworth.

THIS house, which will be offered for sale by auction at the Mart on Thursday next, is noteworthy as being that in which Shelley was a pupil, in 1802-5, of Dr. Greenlaw, who kept a school there. The house, not far distant from the Brentford station of the Great Western Railway, has a frontage to the main London road; the large schoolroom that lay between the house and the road has been pulled down. At Syon Park House one of Shelley's schoolfellows was his relative, Captain Medwin, and afterwards his biographer, who gives many recollections of Shelley's school life there.

Dudley Gallery Art Society.

THE thirty-eighth annual exhibition of water-colours by members of the Dudley Gallery Art Society contains a good deal of work which is what may be called respectable water-colour art; up to a certain standard in style and execution, but not specially interesting. One or two of the exhibitors, as for instance Mr. Duassut in "A Wiltshire Village" (5), rather too obviously derive their inspiration from Mr. Leader. Mr. Pocock's "Beer Head" (26) is a very good drawing of cliff scenery, Mr. Walter Severn, in "Braemore Deer Forest" (50), shows more of real nature and less of conventional effect than usual. A fine hill picture is Miss Martineau's "Cairngorm Mountains in First Snow" (68), and Mr. David Green's "Flood Tide" (76) is a good sea painting. At the top of the room we come on some of the contributors who have rather a decisive style of their own; such as Miss Jex Blake in "The Cornish Coast" (122—rather *too* broad and sketchy), Miss Drew's "At the Top of the Hill" (124), and Mr. David Green's "Sand and Sky" (134). In "The Evening Hour" (152) Mr. George Marks shows a very beautiful drawing of a village scene, on a larger scale and in a rather different style from his usual exhibits here; two of his beautiful miniature landscapes are, however, to be found on the screen. There is real originality of style and colour in the ship painting called "The Fair Portuguese" (155), a ship with a green hull, by Miss Alice Ellis, whose name we do not remember, but whose work we shall look for again. With this we may group Mr. F. J. Aldridge's fine Turner-like effect of calm and colour "On the Thames" (207), with a bright blue buoy in the centre of the composition which is an important element in the effect. Among other works to be noted are Mr. Duassut's

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"Summer Morning" (208); Mr. Stannard's "The Sandpit" (213); Miss Eleanor Brace's "Shadow and Sun" (212) and her clever bit of humour and colour called "Air-balls" (40); Mr. Stormont's "November Mist" (83); Mr. Coleridge's "Deserted Garden" (90); Mr. Tayler's lovely head called "In Celia's Arbour" (98), and Miss Rose Hake's "Morning Light on Beer Cliffs" (87), a fine effect, and a picture exceedingly true to the character of the place.

Society of Fine Arts.

AT the Fine Art Society's Gallery are two collections of water-colour drawings by lady artists, "Irish Life and Scenery" by Miss Mary Barton, and "Flowers and Gardens" by Miss Ina Clogstoun. The former is much the most interesting collection in an artistic sense. At first sight Miss Barton's work seems rather superficial in execution, but it gains upon one on further examination by the fine qualities of colour and composition shown in many of the drawings. The desolate country of Wicklow is impressively shown in "Kilcool Marshes" and "Salt Marshes" (16 and 19). Among other drawings worth special note are "An Old Stronghold, Co. Galway" (6); "Cornfield, Co. Waterford" (20), fine in colour and in breadth of treatment; "In County Galway" (22), an admirably composed landscape; "Sligo Town" (28), with the river flowing between the houses; "Killiney from Foxrock" (31), with its foreground of gorse flowers; a bit of St. Anne's Garden, Clontarf" (55); and "A Cottage Holding, Co. Dublin" (57). Miss Clogstoun's drawings are mostly subjects around which flowers cling; they are somewhat gaudy in colour for the most part, but "The Road to the Royal Villa, Florence" (36), with its dark pyramids of foliage flanking the gateway, and the undulating line of hills beyond, makes a fine picture.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE President (Mr. W. Emerson) presided at an ordinary meeting of the Royal Institute of British Architects, held at 9, Conduit-street, W.C., on Monday, when Mr. F. W. Bedford read a paper on "Baldassare Peruzzi."

Mr. Alex. Graham, hon. secretary, said he regretted to have to announce the death of Mr. James Stevens, a Fellow elected in 1877. Mr. Stevens was a past treasurer of the Manchester Society of Architects, and practiced for over forty years in Manchester. He was sure it would be their wish that a letter of condolence should be addressed to the relatives of their deceased member.—It was also with extreme regret that he had to formally announce what they were all aware of—the death of the Marquis of Dufferin and Ava. He was elected an hon. Fellow of the Institute in 1866, and a letter of condolence had been forwarded to the Marchioness by order of the Council.—Another death he had to announce was that of Mr. E. W. Barnes, a Fellow of the Institute, of Bristol, who was elected in 1882.

The Chairman remarked that the Council that day had directed that a letter of condolence be sent to the Marchioness of Dufferin.

Gift to the Library.

Mr. O. Smith said that through the generosity of persons interested in Gothic architecture and others desirous of honouring Mr. J. K. Colling, a fund was recently formed to purchase the original drawings prepared for his published works in order to present them to the Library of the Institute. The idea originated with Mr. H. Batchelor who recognised the interest and value of these drawings and thought they ought to be where they could be used by students for all time. The great skill, care, and accuracy displayed in these fine drawings, many of them made under the greatest possible difficulties, showed Mr. Colling's intense love of Gothic art. The five volumes would find a suitable home there and be an available mine of interest to present and future students of Gothic art as well as all those who delighted in good drawings. A letter from Mr. Colling would show how greatly he appreciated the idea. Most of the subscribers were members of the Institute, and those who were not had often testified their personal regard of Mr. Colling in that room. He had formally, on behalf of the subscribers, to present the five volumes to the library of the Institute. There were two volumes representing Gothic ornaments; two representing details of Gothic architecture, and one on Mediæval foliage.

The Chairman said he understood the works cost 190*l*.

Mr. Smith said he had had the pleasure of handing Mr. Colling a cheque for 190*l*.

The Chairman: And I think you have been responsible for the getting-up of the subscription list to purchase them?

Mr. Smith said he had done what little work there was to do.

The Chairman said that little meant a great deal, and he was sure the Institute was exceedingly obliged to Mr. Smith for the trouble he had taken.

Professor Beresford Pite said he would like to add that Mr. Colling fifty years ago was the first hon. secretary of the Architectural Association, and they had the pleasure, owing to Mr. Rickman's antiquarian researches in the suburbs of London, of their rediscovered dear old friend and to have him at the Jubilee banquet of the Association in the year 1896. He was quite delighted to find that these charming works were still in existence.

Baldassare Peruzzi.

Mr. F. W. Bedford then read a paper on "Baldassare Peruzzi," of which the following is an abstract:—

The author began by briefly outlining the chief incidents in Peruzzi's life. He was born in Siena in March, 1481, the son of a weaver of Volterra who had settled in Siena. As a youth he delighted in frequenting the workshops of the goldsmiths and others who practised the art of design. At the age of twenty he was appointed assistant to Pinturrichio, who was engaged in painting the chapel of San Giovanni. He shortly after went to Volterra and painted a chapel near the Florentine gate, and then was persuaded to go to Rome.

Here, entering the workshop of the father of Maturino, he greatly impressed his master and other artists by his power of design and painting. Agostino Chigi, a rich Sienese banker, befriended and supported him while he devoted himself to the study of the architectural antiquities of ancient Rome. During his stay in Rome, from about 1503 to 1522, he painted and designed a great many buildings. He then spent some time in Bologna, whither he had gone by invitation of the wardens of St. Petronio, that he might take part in the competition for the completion of that church. From Bologna he was almost compelled to return to Siena to prepare designs for the fortifications of the city. After completing this work he returned to Rome and became engaged on St. Peter's. In the sack of Rome, in 1527, he was made prisoner, was maltreated and shamefully tormented, and lost all he possessed. He was ransomed by the Republic of Siena, and was appointed to superintend the fortifications of that city. In 1529 he was sent by the Pope to help the Papal and Sienese armies in subduing the city. After the war he returned to Rome and became engaged in the erection of various palaces and on St. Peter's. He found time, too, to study astrology and mathematics, and became so expert in the art of perspective drawing as to surpass all other masters of the day. He commenced also a book on the antiquities of Rome, with a commentary on Vitruvius, and prepared many drawings for the illustrations. Many writers speak in eloquent terms of Peruzzi's nobility and modesty of mind, which, however, were imposed upon by his patrons, so that in his old age he was very poor. As he lay on his death-bed, to which he had been brought not without a suspicion of poison, Pope Paul III. sent him 100 scudi and many promises. He died in January, 1537, and was buried in the Pantheon by the side of Raphael.

The author then treated of Peruzzi's architectural works—some still to be seen in Italy, others spoken of by various authors but no longer existing, and others which have been attributed to him. Among the former mentioned were the Palazzi Massimi, admired by Peruzzi's contemporaries, and since held to be among the masterpieces of the Renaissance. The beauty of the plan and the refinement of the details have never been surpassed. The cortile of the Palazzo Massimi alle Colonne is one of the most charming in Rome. A still more famous work is the Villa Farnesina, a work which Baron von Geymüller attributes to Raphael. The author dealt with this subject at some length, and showed the weakness of the reasons adduced by Baron von Geymüller in favour of Raphael as the architect. The piercing of the frieze with windows, as at the Farnesina, was a favourite motif with Peruzzi, and is to be seen in many others of his buildings in Siena and at Bologna. The monotony Monaldini complains of in the architectural details of the Farnesina no doubt resulted from the exquisite taste Peruzzi always displayed when he wished to combine painting with architecture, when he was careful that the structural work should not interfere with the more delicate lines of his brushwork. Having referred to a number of other buildings undoubtedly Peruzzi's, or generally attributed to him, the author next discussed Peruzzi's share in the various designs and plans made for St. Peter's. Vasari states that Pope Leo X., desiring to bring the building, which had been commenced by Julius XI. after the design of Bramante, to a conclusion, and finding the edifice too large, resolved to have a new model constructed; "whereupon he committed the work to Peruzzi, who prepared a new model, which is truly ingenious and of a magnificent character." Vasari on this point is confirmed by Serlio, who publishes Peruzzi's model. Vasari also states that the façade of the principal chapel, which had been commenced by Bramante, was completed by Peruzzi, who constructed it of Peperino marble. Peruzzi was appointed architect to St. Peter's on August 1, 1520—less than five months after the death of Raphael—and held the post until May 6, 1527, and from 1530 to 1531, and again from May, 1535, to January 6, 1537, the day of his death. The author expressed his disagreement with the views of Baron von Geymüller, who states that the plan published by Serlio is really Bramante's, that the plan or model mentioned by Vasari was only a combination of Bramante's nave with the choir of Rossellino, and that most of the drawings in the Uffizi which have been attributed to Peruzzi, one or two of which are signed with his name, were made by Peruzzi for Bramante while he was the latter's draughtsman. That Peruzzi was Bramante's assistant is not recorded by Vasari—who knew both, and who published his book of "Lives" in 1550, only thirteen years after Peruzzi's death—or by Serlio, who was Peruzzi's pupil. That Peruzzi was greatly influenced by Bramante, and was a sincere admirer of his work, on which he founded his own style, is undoubted; but there is no reason to suppose that the many plans and perspective sketches by him were made for Bramante, and were not the expression of his own ideas.

In Siena, Peruzzi's chief work was the rebuilding and strengthening of many parts of the city walls; he built seven towers or gateways, four of which—the Porta Laterina, the Porta Pispini, the Porta St. Prospero, and the Porta Camollia—still remain. His most interesting work in Siena is the Palazzo Pollini, or Celsi—one of the most refined and dignified little palaces in Italy. The Palazzo Turchi, outside the Porta Camollia, was built about the same time as the fortifications and the Palazzo Pollini, for in the cornice, which is of terra-cotta, Peruzzi has not only used the same enrichments, but has employed the same moulds for the casting. The details of the frieze, architrave, and cornice are almost Greek in their refinement. A number of other buildings by Peruzzi, or attributed to him, were referred to. Many of his designs for the Church of St. Domenico in Siena are preserved in the Uffizi. Leaving Siena, the author went on to buildings designed by Peruzzi at Carpi, Ferrara, Vallepiatta, Viterbo, Bibbiano, and Caprarola. Vasari says that "Peruzzi prepared the design and model for the Cathedral of Carpi. . . . . The structure was built under Peruzzi's direction, and according to the rules laid down by Vitruvius." Baron von Geymüller does not dispute Peruzzi's

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authorship, but remarks that the design is founded on the elements of Bramante's design for St. Peter's. The author considered, however, that from the style of the building, from the fact that Peruzzi was in Rome when Alberto Pio, for whom the Duomo was built, wrote to his agent that he was sending the model from Rome, and that several writers named Peruzzi as the architect some few years later, the weight of evidence is in Peruzzi's favour.

The author concluded with some remarks on Peruzzi as a painter. His paintings were classed with the best of his day. Most of them were executed as fixed decorations, and very few of his easel pictures exist. The influence of Pinturrichio, doubtless his first master, is seen in all Peruzzi's paintings. Later he owed much to Sodoma and to Raphael. Some of the paintings on the ceiling of the loggia in the Farnesina are in imitation of stucco-work in relief. Vasari says that he conducted the Cavalier Tizian, a most excellent and renowned painter, to see them, and he could by no means be persuaded that they were painted, and remained in astonishment when, on changing his point of view, he perceived that they were paintings. Some of his most celebrated paintings are those in S. Maria della Pau. They were done in 1515 or 1516, and are strongly influenced by Sodoma and Raphael. The paintings in the Villa Belcaro, which belong to Peruzzi's later years, are among his best, and show great decorative power. They are dated 1535, and are the last he did in Siena. Neither Vasari nor any other ancient writer speaks of Peruzzi's designs for tapestry, but in the collection of Prince Sigmaringen there is a sketch of the "Adoration of the Magi," which was attributed to Raphael, but which is really by Peruzzi. The tapestry is now in the Vatican.

Peruzzi is said to have been the most elegant painter among the architects, and the most ingenious architect among the painters. He was unfortunate in that he happened to live at the same time as the three greatest geniuses of the Renaissance—Bramante, Raphael, and Michelangelo — whose influence permeated the whole of the artistic world, and made it impossible for any other artist to achieve anything free from the charge that he owed the idea to one or the other. But although he learnt much from them, he still preserved more of his originality than his other contemporaries, and infused a spirit of refinement into his work which has never been surpassed. What modern architecture owes to Peruzzi, and what architects owe to him, it is impossible to estimate; but no architect, excepting, perhaps, Brunelleschi and Bramante, did more in the development of the application of Roman architecture to modern times.

Sir Henry Howorth, in proposing a vote of thanks to the lecturer, said he thought the paper they had listened to had been most admirable in every way. He thought the history of architecture had been too much an impersonal thistory — that they had had the history of buildings rather than the history of the men with the buildings grouped about them which they designed. It would be a grand thing if some man in the future would take a new departure and give them a more personal history of architecture, especially in the Renaissance style, when they knew so much about the personal history of the architects. In the second place he would like to remark what struck him very often—what a curious thing it was how little Rome, until the year 1500, had to do with the arts in Italy at all. The fact of the matter was that Rome was a huge, howling waste. It had been deserted by the Popes, who had migrated to the South of France, and, of course, they all knew of the magnificent remains left behind there. There were hardly any buildings erected at all in Italy between the ninth century and the close of the fifteenth, and what building was done in Italy—to wit, artistic work—was done in the great cities where the merchants were making great fortunes; where Massimi lived, and spent his money with great taste and great knowledge, and did not, like the modern Massimi's, insist on their own vile taste being expressed by the artist. Massimi made the artist the judge of his own art, and left to him the design, and to do what he thought best and finest and right and grandest. Thus it came about that it was at Florence, at Siena, at Vallepiatta, Ferrara, and at Rome that art was kept alive; and it was a fortunate thing that, when the Popes came back, they came back rich, enterprising, and full of vigour; and Julius II., Alexander VI., and Clement VII. —and especially the great French Pope—poured out their money lavishly, and they had the good sense to patronise the real men of genius who poured into Rome from Florence and Siena; and the architecture they had seen that night was the work of those great men. But what struck them was the great versatility of those great men. They were painters as well as architects. The fact that Bramante was a painter had been almost revived in their day, and pictures were turning up here and there showing that he was an extraordinary genius as a painter as well as an architect. What a thing it was to think he died in poverty and misery? Then if they looked at Rembrandt they found like many others he died in a garret. The remembrance of these facts gave point to the aphorism of a barrister friend of his who said he was quite sure that God Almighty showed his utter contempt for money by the people to whom he had entrusted it. Perhaps it might be a consolation to many a poor fellow who had few chances but who had a great aspiring fire in his soul to think that perhaps it might be in the future there might be a revival of the early days which might put him on a pedestal, as had been the case with others. Peruzzi was a friend to Raphael, and although he must have been rather under the shadow of bigger men, they had been able to revive him in this wonderful way, and by the skill of their friend that night. He did rather an impertinent thing in suggesting to the secretary that he had in his small collection of Italian pictures, a picture which came to him in a curious way, and which had been attributed by some of the very great judges to Peruzzi. It was painted in the Chiaroscuro style, of which they had some other examples in his fresco paintings, in which colour was very much to the front. But in the painting they could see how admirably he could draw the figure, and his taste for classical models, and they could notice especially the curious way in which he drew horses. He hoped that Mr. Bedford would write a monograph of the man, and would illustrate it with as many illustrations as possible, and that he would begin a series of monographs of great architects of the Middle Ages, where they would have the buildings grouped a great deal more scientifically than they had been grouped by Fergusson and other people, who simply wrote a history of the buildings apart altogether from the men who designed them. He thought if they got all the buildings grouped under their different authors, they would find them illustrating each other in a way it was impossible to illustrate them by merely putting them into a serial series in which the buildings themselves were supposed to tell their own stories.

Professor Beresford Pite, in seconding the vote of thanks, said he cordially endorsed the suggestion of Sir H. Howorth as to the importance of architects studying the personal elements in the works of the great men of the Renaissance. But personal element had been altogether absent from their knowledge of the preceding architecture of the Middle Ages, and the work of the Guilds, he supposed, was mainly responsible for their loss of that intimate knowledge which became so interest- at a later period. But as they reviewed the work of the greatest men of the Renaissance, the sense of their versatile mastery, and their extraordinary individuality, was almost overwhelming. When they thought of the great men who preceded Bramante, himself a giant, to be succeeded by Raphael, they seemed to pass to an almost superlative individual force when they came to the work and to the personality of Michelangelo. What they had heard that night of Baldassare Peruzzi was equally true of many of those other great men—his extraordinary facility in painting, and something more than facility, because there was evidence of great genius and great power, and great beauty in his work. If Peruzzi had confined himself to painting, his name would have been very closely allied to the position which Raphael's name held. Then there was his work of engineering and his work of fortification, of which they had had a great many other similar examples. Michelangelo designed the fortifications of Florence, which Peruzzi was sent to reduce. All this showed the character of these men. But there was something which came a little nearer home to them, and that was that in Peruzzi's architectural work and in the methods of planning and design they saw a very striking individuality, which was not quite so evident in the works of his contemporaries. They saw in other men's work the progression from mediæval methods to new methods. They were informed that the great architects who succeeded him were being successful inasmuch as they conformed to antiquarian effects then being dug out of the earth. It led him to ask Mr. Bedford what were the Greek studies which he referred to as having been conducted by Peruzzi? It would be interesting to have the reference, because he was under the impression that they derived the whole of their Classic knowledge from what were called Roman remains. Peruzzi drew from the same source and, he imagined, was estimated by the same standard, viz, that he was correct and their own immediate predecessors were correct. What he meant was that he was correct like Street and Scott only so far as they conformed to the accepted type, and he hoped the work of those two men might be as interesting to succeeding generations as his was to them. But we could not trace in Peruzzi's work dead and dry archæology, or that antiquarian example which kept their Gothic revival so hidebound. In Peruzzi's work their was an individual mastery of planning. . . . There was the ingenuity of the planning of the Massimi palace and other buildings where great effects were obtained in little space, and were all indications of a type of mind which was distinctly architectural and, he ventured to say, exceedingly interesting. The same man tackled larger problems. He tackled the greatest architectural problem of *anno domini*—the problem of St. Peter's in Rome. He was sorry that Mr. Bedford had felt himself precluded from entering into that subject, for Peruzzi's plan of St. Peter's was the first plan which showed any complete solidification of parts. Peruzzi pulled the plan together and evolved the fine squareness and largeness of form which afterwards became embodied in Michelangelo's scheme which he evidently approved and benefited by. They must not forget, although they saw practically nothing of Peruzzi's work in existence, yet the fine squareness which underlies the grouping of St. Peter's was first revealed to the world by Peruzzi. Then if they took the elevation of his palaces, how different they were from the common ones of the time—the great wall with enormous cornices and windows scattered about it. But there was a sweet sense of harmony in all his fronts, due to the dignity with which he employed the great basement, and the complete ornamentation and great delicacy. And then Peruzzi delighted in the greatness of his subjects; the way in which he spread his palaces out and repeated them, they had indications of in his pictures. The man's mind moved in large ordered squareness. There was a real sense of dignity in his proportion and line which was of great value, because he imagined in every case it was of set purpose. Peruzzi wanted to be great—his subject did not make him great, but he made the subject great. With such a feeling in his planning of elevations, coupled with the finest of detail and moulding, they had nearly all the qualities which made a great architect, and so far as he had opportunities afforded him he rose to them without exception. Sir H. Howorth had said a great deal which was interesting especially what he remarked about the condition of Rome in the Middle Ages. In many ways the great cities of the world repeated themselves, and he supposed that London now was to the Scotchman what Rome was to the Florentines and the Sienis—they all flocked to it. In Rome there was everything that was beautiful. He was hoping that the day would come when they would recognise that London was to the English the home of art.

Col. Prendergast said he agreed with most of what had been said by the last speaker. What they had to judge Peruzzi by, speaking generally, was the Palace Massimi, and he thought it showed that he was a disciple of Alberti. They were both mathematicians of the first class, and they saw in every line of their works that that was the case, coupled with the extraordinary facility they had of unearthing and measuring ancient work of the Roman period. These two things created a school in the very earliest period of the Renaissance which produced a profound effect on the future of that style of architec-

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ture in Europe. He believed it was Mr. Fergusson who acknowledged that St. Peter's at Rome and all the great churches of that style had been originally evolved from the works of Alberti. There was no doubt that the minds of Alberti and Peruzzi ran in the same groove, and Peruzzi, say what people may, had left his mark on the great church of St. Peter's at Rome which could never be obliterated. It was of extreme importance that the rising generation of architects in this country should not be misled. Fifty years ago there was a fatal tradition that led people to despise and almost to hate the style of architecture which was embodied in St. Peter's in Rome, and St. Paul's in London. To his horror and astonishment he took up the *Journal* a few weeks ago, and found an article, written by one who had evidently derived his opinions from this erroneous view of fifty years ago, and, what was more, the editor of the *Journal* was threatening them with some more of that kind of thing. It was of the utmost importance, in his opinion, that the erroneous estimate of the work of St. Peter's should be absolutely obliterated and got rid of. It was of the highest importance that the rising architect should be able to realise what that work meant. There was no doubt that people were beginning to learn the value of this great Renaissance building, and it was desirable to understand the change of public opinion in this matter. He had with him the remarks of John Richard Green, one of the most cultivated men of the time, who visited Rome (I am speaking of the author of "The History of the English People"), and, notwithstanding this old and erroneous tradition which surrounded him, this is what he said about it :—"You would have smiled to see me in St. Peter's, and owning myself in the wrong. I went prepared with all sorts of charges against the façade, and it deserves every one of them. So, too, I had a pocketful of faults to find with the inside until I entered. From that moment, except the waste of the side aisles, I could see none. No interior of a great church ever so satisfied my conditions of taste before. It conveyed the impression of its size, and yet size only lent grandeur to its beauty ; and seen as I saw it, full of light and colour, there was a pervading joy and lightsomeness amidst all its peaceful quiet which I have never felt elsewhere. It was such a sweet bit of irony, this finding in the chief church of what people call dark bigotry and obscure mysteries the brightest and least mysterious Christian sanctuary ever seen." Such is the change of public opinion with which the architect of this new century has to reckon. Moreover, he must not despise the works of these giants of the Renaissance.

The vote of thanks having been heartily agreed to,

Mr. Bedford, in reply, said he was very much impressed with Sir Henry Howorth's words in which he said that he believed in a more personal study of the architectural work of the Renaissance. That view was also expressed by Professor Pite. It was a feeling he had had for a great many years, and it was really the feeling which prompted him to make a study of Peruzzi. It was about twelve years ago now since he spent some considerable time in Siena, and he was much impressed with what he saw there of Peruzzi's work, and afterwards he went to Rome and other towns in Italy, and saw still finer works by Peruzzi, and he thought it would be interesting to study his life and to get to know something more about him, and he thought it was a most excellent way to study architecture. If anybody would take the trouble to take up the lives of the architects and study all their works, he thought it would be a most interesting study. With regard to the Greek studies which Professor Pite spoke of and asked where Peruzzi obtained them, Peruzzi himself spoke of the work which they were digging up in Rome, and many of the masterpieces of which were of Greek origin. There was no doubt that Peruzzi studied them minutely.

The Chairman announced that the next meeting would be held on March 3, when the Gold Medallist for 1902 would be elected and there would be a photographic exhibition, and it was hoped that Sir Benjamin Stone would be present. They would also consider a letter from the Smoke Abatement Society, which had asked their co-operation, and in which it was urged that members of the Royal Institute might join the Society.

The proceedings then terminated.

Professor F. M. Simpson, President of the Liverpool Architectural Society, was specially elected to the Fellowship of the Royal Institute of British Architects at the meeting of the Institute Council last Monday.

THE ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of the Architectural Association was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, Mr. W. H. Seth-Smith, President, in the chair.

The minutes and some nominations having been read, Messrs. P. W. G. Rudhall, C. K. Roe, and B. Drummond were elected members of the Association.

Mr. H. P. G. Maule, Hon. Secretary, proposed a vote of thanks to Professor Beresford Pite for allowing members to visit Christ Church, Brixton-road, on February 1. This having been agreed to,

The Chairman announced the following additions to the New Premises Fund, *i.e.*—Messrs. Arthur Harston, 3*l.* 3s. ; H. D. Wilkinson, 2*l.* 2s. ; H. J. Potter, 1*l.* 1s. ; and T. R. Hooper, 1*l.* 1s.

The Chairman also announced that a meeting of the Discussion Section would be held on the 21st inst., when Mr. F. C. Eden would read a paper entitled "The Organ : its Proper Position and Architectural Treatment."

Mr. R. S. Balfour, Hon. Secretary, announced the following donations to the Library :—"Sketches from France and Italy," by W. E. Nesfield, presented to the Day School by Mr. Arnold Mitchell ; and the Post Office Directory for 1902, presented to the office by Mr. W. G. B. Lewis. A vote of thanks to the donors having been agreed to,

Miss Ethel Charles read the following paper, entitled,

"*A Plea for Women Practising Architecture.*"

I appear before you to-night with a certain amount of diffidence, as the subject under discussion is not of my own choosing, and I fear I cannot do it justice. The title, to start with, is somewhat misleading. The dictionary says : Plea means a lame excuse or apology. Now I do not propose to offer any lame excuses or apologies, all of which would be unnecessary under the circumstances. I shall merely bring to your notice some facts relative to woman and architecture, with most of which you are doubtless already familiar. Then again, the title seems to suggest that I am conscious of a feeling against women architects, and since I read the paper before your Association, it further implies that I believe such hostility is to be found amongst your ranks. Now I wish it to be clearly understood that I disclaim both of these assumptions. Doubtless your committee had their thoughts directed to the choice of this subject by the knowledge of the existence of this feeling ; but, personally, I have never met it. No one has ever maintained before me that a woman should not practise as an architect, and if this view is held, I venture to think it can only be held by those outside the profession, who are consequently not acquainted with the functions, powers, and responsibilities of an architect.

Since you are members of the profession, it seems superfluous to address you on the subject, as you must know better than any one what are the qualifications necessary for the exercise of the same, and therefore know better than any one that it is not a case of man or woman being best fitted to practise this art, but that it is entirely a case of personal capacity.

In a back number of the *British Architect* I came across the following remark :—"Whether women, as a whole, are fitted to take up the profession of architecture we hold somewhat strong and, it may be, conservative views—views which we do not think it would serve any useful purpose to discuss." I hope very much that some one present holds similar strong and conservative views, and that he will be kind enough to express them to-night, as I may tell you the subject was selected by your committee as being a peculiarly useful and suitable one.

It would be a bold man who would assert that "women as a whole" are fitted to take up the profession, considering so few women have turned their thoughts in its direction ; but it would be a still bolder man who would assert that men, as a whole, are fitted to take up the profession, *vide* the enormities that are daily committed by men in the name of architecture. I repeat, it is not a case of men *versus* women ; it is a case of individual capability and aptitude.

However, there are some people, we are given to understand, who do maintain that woman, *per se*, is unsuited for practising our art. Wherein the weak point lies we shall, no doubt, discover in the course of the evening ; but as far as I can judge it lies outside the woman, and is not a defect inherent in her. I suppose the reason why woman should not practise architecture is because, except in one or two isolated cases, she has not practised it hitherto ; and this is no reason at all.

The same objection is brought forward every time that women have attempted to enlarge their sphere of action, and yet yearly new proofs are given that intellectually women can, at least in many cases, hold their own with men. The results of University examinations show it ; members of the medical profession testify to it ; the legal profession numbers women in its ranks, both in France and in America, though up till now in England women have only been allowed to study for, but not to practise at, the Bar. "Let them study by all means," the conservatives say, "but draw the line at practice." And what is the use of instruction, I ask you, if it is to be turned to no purpose ? What is study without an object ? Knowledge without application ? It is simply creating wants without granting the power of satisfying them. Living is not learning, but applying what one has learnt.

If, then, it is granted that woman is intellectually capable of wrestling with the problems of architecture, are we to suppose that she is physically incapable of carrying on the work entailed ? It were unreasonable to say her strength is not equal to the task when we see what women actually do in this country. Take chainmakers, for instance. Hundreds of women are employed in the very heavy work of chain making, a most arduous trade, and you must remember how two or three years ago certain philanthropists were anxious that legislation should put a stop to this, as they asserted, the work was too great a strain for a woman. This intervention only resulted in the Home Secretary being besieged by indignant deputations of these same women, all protesting their competence and defiantly baring their muscular arms as evidence of the strength on which they prided themselves. Then, again, our agricultural labourers are not by a long way all men. In harvest time, when the work requires to be got through with all speed, women are called upon to labour side by side with their husbands and brothers ; they toil from earliest dawn to latest twilight, through all the burning heat of the early autumn day, and, so far from succumbing to this exposure, they weather it with the best of the men and live to seventy and eighty years of age. Now the bodily fatigue an architect must be prepared to undergo cannot be compared to the physical strain our women endure when employed as field farers or as chainmakers.

I do not mean to make light of the arduousness of the profession. The mere study of architecture involves a great deal of physical as well as mental strain, and since practice means the continuance of study and added to this responsibility, the profession is certainly not one to be adopted by the physically feeble. But women are not all physically feeble, any more than men are all physically strong. You have heard of architects—men—breaking down through overwork, but you would not for that reason say that all men are unfitted to practise the profession. I have never heard of a woman architect breaking down, but neither do I assert that all women are fitted to practise architecture.

Those who base their objections to women architects on the fact that they are an innovation, and therefore to be suppressed, will fling their prejudices and fears to the winds when what is now an innovation comes to be a recognised institution. Already in America one town has a lady for a consulting architect, and we are given to understand that her designs for schools, prisons, and railway stations compare favourably with other similar works in the country.

But there are some opponents who are more specific in their objections, and it is with these we must now deal. Their objections really arise from an imperfect knowledge o what an architect is. The e is a general idea afloat

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that architects "make plans" and climb ladders, but beyond these two accomplishments nothing certain seems to be known. The former occupation is acknowledged to be quite a legitimate one for a woman, provided she have the necessary gifts, but the latter cannot be countenanced for a moment, even though she may be sufficiently courageous to attempt it, and can be trusted not to lose her head on the scaffolding. As far as I can gather, it is not the climbing that is objected to, but the fact that she may be *seen* climbing a ladder. Therein lies the difficulty. No less an architect than Wren shows us a way round, if not over, it. The famous Duchess of Marlborough informs us Wren "was content to be dragged up in a basket three or four times a week to the top of St. Paul's, and at great hazard, for 200*l.* a year." No one could object to a woman being hoisted up in a basket any more than they could object to her making use of the more conventional elevator. Climbing a ladder is condemned as unwomanly, but so was riding a bicycle or being seen on the top of an omnibus not so very long ago, and yet all are now seemingly reconciled to these unwomanly practices. Besides, the ladder question could only be raised by persons who are in ignorance of the portion of a lifetime that an architect spends upon a ladder, and, as this is so infinitesimal, it is unworthy of consideration.

But, besides the objector to innovation and the objector to ladder-climbing, there is the man who has dealt personally with architects as their client, and who knows very definitely what an architect is and what he expects from him. He must be a thoroughly artistic, scientific, and practical man. He must be able to design at all possible speed a convenient, durable, and beautiful building of any one of the three groups into which buildings may be roughly classified—domestic, ecclesiastical, and civil. He must have an intimate and familiar knowledge of every material and every trade employed in the realising of the said building, in order that none but the best of its kind and the best of technical skill may be employed. He must be a master of scientific construction, in order to prevent waste of time, material, and money. He must keep all accounts relating to the work, bear in mind the interests of client and contractor, and manage everything without allowing any friction to come about between the different parties concerned. This list is not complete; I have mentioned but a few of the functions required by an employer of his architect. For the sake of argument we will suppose that they appear to offer just so many obstacles to a woman following the profession.

I use the word "profession" because it covers more requirements than art, craft, or faculty, and though it has been weighed and found wanting, it appears to be the word in most general use when connected with the practice of architecture.

To succeed in architecture one must be, as I have said, artistic, scientific, and practical in business matters; that is to say, success is largely a matter of natural gifts, education, and experience. Now, who will assert that the necessary gifts are not and cannot be possessed by woman; that she does not receive the requisite general education, and that experience may not be acquired by her as well as by man.

Let us look first at the æsthetic side of the question. Architecture has been defined as good construction inspired by an artistic motive or by the instinct of the beautiful. Now this instinct of the beautiful, or, as the French put it better, *ce sentiment du beau*, is as a rule more strongly developed in the woman. Nearly every woman is more or less impressionable, that is, she is an artist by temperament. Her taste will lead her instinctively and intuitively to a result which a man will reach by a series of criticisms and reasonings. He sees the truth, she feels it. The beautiful is attained by both, what matter if the paths they follow are different.

In most cases (outside the profession, be it understood) who is it who cares to be surrounded by beautiful objects and attempts as far as is possible to make the home a thing of beauty? It is certainly not the average man, who so long as he is comfortable cares little for the appearance of his surroundings. It follows, then, that it must be the woman, who will cheerfully sacrifice even comfort to her conception of beauty, if any choice have to be made between the two.

Some people go so far as to say that a woman must necessarily know how to plan a house better than a man, because her household duties suggest to her the wants and requirements that must be met. We do not agree with this view. The best housekeeper in the world may have most definite ideas as to what she requires, but she will not produce a plan, that is the suitable disposition of spaces, till she have learned what rules and precepts must be obeyed in planning a house. And these rules, being all based upon common sense and obvious reasoning, are as patent to men as they are to women.

We must not, however, lose sight of the fact that the influence of woman in domestic architecture has been felt ever since the progress of social relations made her the equal instead of the slave of men. Woman's position in a country is the surest sign of the social progress in that country, and it was in the sixteenth century, when women began to be respected "as a whole," and not in individual instances, that domestic architecture regained its prominence. It was when a woman ruled this country, and by her personality influenced many, that castles, cathedrals, and colleges—buildings designed for men by men—ceased to be the most important architectural objects erected. Elizabeth's reign is remarkable for the number of radical changes which took place, and in no direction was the change so marked as in architecture.

At the time when, under James's rule, the Scotch were dwelling in fortresses about as comfortable as a Norman keep, the English under Elizabeth were vieing with each other as to who should build the most roomy, most convenient, and most beautiful houses. It is noteworthy that the great Queen spent not a penny herself in the interest of building, but she gave her noblemen much moral support, encouraging them to spend their thousands in erecting palaces worthy of receiving her as a guest. One of the most indefatigable builders of that time whose name has come down to us was a woman, Elizabeth of Hardwicke. Of the "three most elegant seats that were ever raised by one hand," so says her biographer, only Hardwicke Hall remains, and judging from its monotonous symmetry and extravagant window-space, we have, it seems, little cause to regret old Chatsworth and Oldcotes. Besides her three country seats, this lady left "stately almshouses for twelve poor people" in Derby, and personally superintended the construction of "a splendid mural monument" to her own memory in All Saints' Church, Derby. Her biographer, alluding to her passion for building, describes her as "a woman of a masculine understanding and conduct; proud, furious, selfish, and unfeeling." Apparently we are to gather that these unattractive qualities, pride, violence, and egoism, go hand in hand with a masculine understanding. If, as Hardwick shows, she lacked artistic feeling, she was, on the other hand, a thoroughly practical woman. Of the four husbands she outlived, three were wealthy men who were able to supply her with the means of indulging in her favourite pursuit.

In France, where women stand out more prominently than in England, and during the early Renaissance, when they were most conspicuous even as politicians, warriors, and poets, we find them occupied with building at an earlier date than at home. Marie de Pierre-Vive, Dame du Perron, one of the ladies of the household of Catherine de Medicis, was officially associated with Philibert de l'Orme during the erection of the Tuileries. In 1566 her name stands among the list of "MM. les Surintendants des Bastiments du Roy," and it is interesting to note that where she and de l'Orme signed papers together, Dame du Perron's name comes first. Her Royal mistress was another woman of "a masculine understanding," and insisted on her own plans being used for her palace. De l'Orme writes to her "Lequel Palays je conduis de votre Grace suivant les dispositions, mesures et commandement qu'il vous a plait m'en faire."

But however artistic a woman may be, her natural gifts alone will not suffice any more than will those of a man, without study and direction. Art has its restrictions and its limitations, which must be recognised and appreciated if truth and nature are to be our guides; and architecture is particularly restricted and limited in theory and in practice. In theory it is bound by those rules of art inspired by taste based on traditions, and by those rules of science which can be demonstrated by invariable and absolute formulæ. And in practice it is limited by structural conditions, which, if neglected, result in the collapse of the building; it is limited by the physical properties of material, by the climate, by the habits and necessities of the moment.

Study of æsthetic rules produces fine designs, and study of scientific laws produces fine construction. Construction demands a knowledge of the principles of mathematics, besides a knowledge of the properties of building materials. Now, mathematics involve logic, or the science of reasoning correctly, and hitherto logic has been held to be the peculiar inheritance of man as opposed to woman. It may be freely granted that among uneducated women, possibly a larger proportion are more illogical in their every-day conclusions than among an equal number of uneducated men; but it by no means follows from this that the brain of the average woman of education is less capable of mastering the science of logic than that of the average man of education. Now, we are only discussing cultivated women, and all reference to the uncultivated and illogical class is beside the question. That logic can be mastered is proved by the successful results achieved by women at the Universities, where they show peculiar aptitude for the science of mathematics, the numbers who devote themselves to this study being great, out of all proportion to those who select other schools or triposes. Again, at the École des Beaux-Arts, where the architectural course includes, besides an immense variety of other subjects, a very high standard of mathematical ability, a woman, an American, has lately had the honour of carrying off the Premier Prix over the heads of her brother students.

But pure mathematics are of little use without familiarity with the properties of building materials, and this familiarity, it is argued, can only be gained by a technical knowledge of the trades employed in building. In the Middle Ages the architect was only distinguished from the workman by conspicuous natural gifts and greater skill in technique; he who was most familiar with his materials produced the finest designs. The workshop was then the training-ground for the embryo architect, and doubtless would have proved a rough school for a woman. But now, however much the fact may be deplored, most of the architect's work is produced in an office, and not in a workshop, and is due more to his intellectual activity than to his manual skill in any trade. If, then, good design depends upon the proper use of material, and this use may only be learnt through handling it, how comes it that fine designs are produced by men who are in no way fitted to work with such material, and that, on the other hand, most of the builders who dispense with the services of an architect, and many of whom are skilled in one or more trades, produce crude results which, though they strive after, fail to realise architectural effect? The answer is simple. It is largely a matter of education and preparation which enables the sharpened intelligence to grasp more readily the principles of technical skill. This general education is indispensable to architectural study, and since there is but slight difference now-a-days in the course of education pursued by men and women, I cannot see that the absence of workshop training should now-a-days hamper a woman more than it does a man. Do not mistake my meaning. Education cannot create the gift of design, for designers, like poets, are born not made; but it fosters and encourages this gift and calls out the highest faculties when they do exist in the student. No amount of training will make the deaf and dumb to sing; but, for all that, training is invaluable, not to say essential, to a singer who means to do his voice justice. If I may be allowed a misquotation:—

"Books, gowns, degrees will leave a fool a fool,
But designs are best when the designer's been to school."

Granted, then, that woman is fully competent as far as the æsthetic and scientific sides of the profession are concerned, there remains the economic side to be considered. This covers all the business transactions that take place between the architect, client and contractor, and involves the exercising of a large amount of tact in order to make matters run smoothly. Without tact a business man will not go far, and this indispenable quality seems universally acknowledged to be dealt out more generously

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to woman than to man. In France, every woman is born a business man, and her taste is never questioned, whereas in England it is the exception to find a man who combines artistic talents with business qualities.

The stumbling-block in the business seems to be that the architect is responsible for the quality of the work done and so has to oversee and direct the workmen. This, for some reason, is supposed to be beyond the powers of a woman; I am told it is objected, she cannot use the necessary amount of strong language to keep the workmen up to the mark. But surely there are other ways of enforcing your will than through the medium of unseemly language. There is not one man in twenty who has realised that gentleness may be a force. A man will boast of his want of self-control; he flatters himself that abusive language shows him to be a man of strong character, a master; he would count himself less manly were he less violent, and yet you must confess that some of the gentlest men you know happen to be those who always get their own way and compel people to carry out their wishes whether they will or no. St. Paul's Cathedral, one of the finest examples of Renaissance work we have in England, is a living example of what workmen can produce without the stimulus of abuse. Wren had the "ungodly custom of swearing" in such abhorrence that he posted up an order to the effect that, upon sufficient proof, the clerk of the works should dismiss any labourer guilty of this crime, and further that "if any master working by task shall not upon admonition reform this profanation among his apprentices, servants, and labourers, it shall be construed his fault, and he shall be liable to be censured by the Commissioners." Besides, swearing at one's subordinates is really not as fashionable as it used to be. In the Army and the Navy, where formerly the slightest order was accompanied by a volley of oaths, the change is strongly marked, and the officer who now so far forgets himself as to swear at his men lays himself open to a severe reprimand from those who are of superior rank to that which he holds.

I think I have touched upon most of the points which might be brought forward as objections to women practising architecture, and I trust we shall all be agreed that the obstacles are more imaginary than real. But there is one other point I ought to refer to before closing, and that is the "new style" some people are clamouring for. Since women began to study architecture it has been suggested that they may supply this pretended want, but as yet there has been little to warrant the conjecture that the fresh inspiration will come from that quarter. Women make intelligent interpreters and passionate disciples, but, to judge from the testimony of bygone centuries, their power stops short at creation. It may be wrong to assume that woman is totally wanting in inventiveness, and it may all be a question of upbringing and training. Hitherto men have always led the way, for the race is to the swift and the battle to the strong, and men have been the swift and the strong since women's upbringing taught them only dependence and reliance, and in no way fostered originality. But now-a-days women are expected to think and act for themselves, and this self-dependence and self-reliance may prove to be the generating spark which will rouse to activity the originality and creative power which, for all we know to the contrary, may have long lain dormant within them.

But in any case this want of creative faculty would not hamper a woman architect. Architecture is a logical art, and no change has taken place in it without a very obvious reason, and when no reason can be adduced for original and capricious designs, such productions are grotesque and not architectural. The truest architects are not distinguished for brilliancy of invention so much as for careful attention bestowed on the smallest details of their work, and women, "as a whole," possess the faculty of worrying out details so small that they often are apt to escape the attention of the more comprehensive mind of men.

If I do not stop now you may go away with the impression that I consider women more fitted to practise architecture than men, and nothing could be further from my thoughts. May I, in concluding, repeat what I said at the beginning of my paper, that it is not a question of men *versus* women, but that it is entirely a case of the capacity of the individual.

The Chairman, in inviting discussion, said they must all congratulate Miss Charles upon her admirable paper and the admirable manner in which she had delivered it.

Mr. Arnold Mitchell, in proposing a hearty vote of thanks, said Miss Charles had presented her case so clearly and fairly that she went a long way to disarm criticism; at the same time, they were there to discuss the paper, and Miss Charles would be the last to complain if the views which they might give expression to were different from those which she held. He had been struck by one remark in the paper, *i.e.*, "Art has its limitations." So had sex. It was all very well to deal in generalities, but of course it was the smaller matters which they were concerned with in dealing with this problem—for undoubtedly it was a very serious problem, and one which was likely more and more to become a pressing and burning one, *i.e.*, this problem of sex and of the woman taking up work which the man up to the present had been accustomed to consider his own particular province. What did one mean exactly by "the limitation of sex"? It was a difficult thing to define, but take an illustration from actual practice. The architect had to deal on the one hand with his client and on the other with his builder. The architect, in dealing with his client took that client's instruction, prepared the scheme in accordance with his client's wishes, and gave all the thought and skill to the work of which he was capable; so far he could go with Miss Charles in saying that, given equal education and natural ability there is no reason why a man should do better than a woman; but there were other people to deal with besides the client. There was the contractor, for instance, and it seemed to him that it was here that the limitations of sex came in. A woman architect would have to go to a building that she was carrying out, and she might have to reject material, perhaps. Now, however much we might disagree with the point of view, it was a most difficult thing under such circumstances for a man to take orders from a woman, more particularly when there may be an honest difference of opinion. All nature in the man seemed to resent accepting such orders, and with all the tact in the world difficulties, which he thought were insuperable, would occur in the actual carrying out of the work. One might crystallise this point of view by saying that women might do designing work as well as men, but that the execution of the work was outside their powers. Even if one eliminated the contractor, with the inevitable dealings with the foremen and with men, it was impossible to conceive circumstances under which a woman could always be successful in those dealings, and without continuous success she could not hope to make a success of her practice. No doubt there were other views to be brought forward, but beyond this question of the limitations of sex he did not see that they need go. It required much thought and preparation to be enabled to discuss properly the question raised by a paper which had been thought out so carefully. There was one point, however, that he might refer to, and he thought that most of them would be in agreement with what he had to say. It was in reference to the bogey Miss Charles had set up only to knock down: the bogey of strong language. He had had twenty-three years of architectural experience, and he had never, either as assistant or in his own practice, or acting with other architects, heard a single word of strong language—that was to say, swearing—used in condemning materials or in dealing with men. It was a bogey of Miss Charles' invention, but it ought never to have been put up. They must all of them have felt it to be a great pleasure to listen to such an admirable paper, and they must all heartily thank Miss Charles for the trouble she had taken and the courage she had shown (for it did want courage to address a body of men on a subject such as this, where some opposition might not unreasonably be expected.

Mr. Leonard Stokes, in seconding the vote of thanks, said it was not often that they heard such an excellent paper delivered with so much sense and understanding. Miss Charles had certainly taught them a lesson in delivery, and she had shown that a woman could be, at any rate, thorough; and if she had shown nothing else she had distinctly shown that a woman could beat a man very often in thoroughness. Whether it was due to cricket, football, billiards, and perhaps smoking, he did not know, but men, as a rule, did not seem to be so serious as women, and the success of women in some directions had shown that men must look out if they were not to be left behind. Whatever woman took up she seemed to put her whole soul into, and men did not always seem to do the same. Miss Charles said that men were responsible for a vast amount of ugliness all round us; that was perfectly true, he was sorry to say, but Miss Charles had not shown, for she could not, that if women architects were in the same proportion to men architects, there would be any less ugliness in architecture. That remained to be proved. At all events, Miss Charles had made out a very good case for allowing women to try what they could do. As to the question of strong language, he was glad that Mr. Mitchell had heard so little of it, but that was not the experience of all of them; in any case, he thought Miss Charles scored a point in saying that persuasiveness was often quite as effective as anything else, and in his opinion it was not at all necessary for violent language to be used when one went on to the works. It was not easy, however, to imagine how a woman was to deal with a difficult contractor. Perhaps it would prove to be quite an easy matter, but as it was hard enough for a man to do so sometimes, it would seem to be still more difficult for a woman to overcome that difficulty. Of course, a woman had sometimes to deal with a cantankerous cook, and a cantankerous cook was as difficult to manage, perhaps, as a cantankerous contractor; but, still, the fact remained that women, as a rule, could not bring themselves to put their foot on a cockroach, and how could they then be expected to put their foot down upon a contractor when it was necessary? As to climbing ladders, it might be that women could do so as easily as they rode bicycles, but we were certainly not used to seeing women climbing ladders. That might be old-fashioned, and we might get used to the innovation, but, in any case, it was essential that a practising architect, whether man or woman, had to get about the building. In a large work the clerk of works might be looked to to do a lot of that getting about, but on a small building on which a clerk of works could not be afforded, the architect ought to do it. A man could easily do so, could a woman? He did not know whether it would be possible or desirable to provide a basket for her always in place of the ladder. But even if a woman escaped the scaffold business, there was the awful problem or prospect of matrimony, which upset so many plans and calculations. A woman took up some pursuit or profession with a light heart and made great preparations by study and hard work, and then this business of matrimony came along and upset everything. If a woman architect thought she could carry on her practice as well after as before marriage he was afraid she would find she could not—that was if things were to be done as they were now. As a woman was expected to look after her house—of course that might be considered an unreasonable expectation; but so long as it was expected, he did not see how she could, if an architect, look after her practice as well: either house or practice would have to be given up, or both would go to the dogs. He supposed that Miss Charles would agree that when a woman married it was one of her duties—he did not know whether it was her first duty—to keep a more or less happy home over her husband's head, and he was afraid that if she looked after builders and climbed scaffolds her husband would be made somewhat uncomfortable. Another little difficulty which appealed to him somewhat was what a woman architect would do if she had to travel a long distance to attend a work—say to Ireland or Scotland. She would have to put up at little inns, and would that be agreeable to her? And was she to take a chaperon with her or not? And would she mind driving across country (as a man architect frequently did) with a mere man driver? Was she to do this, and, if not, would she be thought foolish for not doing so?

Mr. R. H. Weymouth, in supporting the vote of thanks, added his testimony to the excellence of the paper, and to the way it was read, but, he said, he did not think the paper had carried conviction. He thought Mr. Mitchell had indicated how far it was possible for a woman to go in work, and he (the speaker) held very strongly that it was undesirable for a lady architect to superintend work generally. At the same time with regard to

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office work and designing and planning, it was quite possible that such work could be done admirably by women, and he saw no objection to that. Miss Charles, in her reference to the thoroughness with which women went into detail, seemed to suggest how far a woman might practise architecture, *i.e.*, in the smaller matters connected with house-planning—matters like cupboards, fireplaces, dressers, kitchen and scullery arrangements generally; all the matters, in short, where minutiæ were necessary, for they had an aptitude in that direction which was unquestioned. All architects knew, especially in connexion with early practice, how difficult it was to satisfy the lady client in such matters as dressers, cupboards, and things like that—things which helped to make a house comfortable—and often the arrangement of such matters was left to the builder, who did the work badly, and the architect got the responsibility for it. In all that sort of work, which did not necessitate going upon a building in its rough and uncouth state, or climbing ladders and scaffolds, &c., there was an admirable field for the lady architect, and in that sphere she would, as a rule, be better able to do the work than men. Decorative work, and inside details and finishings, which fell into the hands of architects, and which a great many men did not know how to do properly, could very well be left to women. He felt that the "rough and tumble" of life was for man, and that the more refined and less arduous work, in the main, was for women. As to women who did chain work and other laborious work, the sooner that was altered the better. Though it might be old-fashioned, he did not think that women should be called upon to do such work. He did not think there need be any clashing in a division such as he had suggested of architectural work.

Mr. Butler Wilson, having congratulated the lecturer on her paper, said they were in the habit of hearing in that room that there was a difference between building and architecture. He was of opinion that, fully to carry out the duties of an architect in the highest sense, it was impossible for any one man to cover the whole of the ground. The same fact had been shown in medicine and other professions, and it had been gradually proved in architecture, as they saw around them. They found one man building asylums, and another man building houses of such a character as to fill the asylums. He always thought, in regard to the interest of women in architecture, that if there was one department in which woman might come in as a specialist it surely was in domestic work. The several apartments of a house were very often designed with the idea, he supposed, of being left to the builder to finish off, and the furniture, &c., which should be artistic and elevating in its tendency, was often selected without any such consideration. Any of them who had had much to do with housework knew that there were occasions when they not only selected the pictures for a man's house, and even paid for them, but they bought and fixed his furniture and ornaments for him, and, in short, they made what they felt was a home when they left it—they often felt it was a home to them, but how often was it a home to the owner? It was often a very uncomfortable place. Now, a woman "architect" might very well take the place of a man in such matters and be more successful, for, having more leisure than a man, as she probably would, she could consult the client more, and not only get to know his wishes, but could make suggestions, and might, in that way, gradually improve the taste of the public in matters of design. There was a field for the lady architect or lady decorator; he was rather inclined to think that decoration was the largest part of architecture.

Mr. H. P. G. Maule, having referred to the lucid and logical character of Miss Charles' paper, said it seemed to him that the whole point of the matter was summed up by what Miss Charles said, *i.e.*, "It is not a case of man or woman being best fitted to practise this art, but it is entirely a case of personal capacity"; and so it was. If any woman had a desire and a feeling to "scorn delights and live laborious days," why should she not? If she had a desire to practise architecture and a wish to see if she could overcome a fractious and disagreeable builder, why should she not? If they tried and failed, they would drop out, for success came, as a rule, only to those who had capacity. But by all means let them have the opportunity of trying what they could do. John Stuart Mill said, "Institutions, books, education, society, all go on training human beings for the old long after the new has come: much more when it is only coming." Do not let that be the reproach against architects, though he thought there would be less likelihood of that reproach being necessary after the paper they had listened to that evening. As an Association he thought they might be congratulated on being the first body in this country representing architecture before which a paper by a lady had been read. To open up the study of architecture to women, and to give them an equal opportunity with men, was not only justice, but it doubled the chance of finding those who could do good work. As Miss Charles said, there were a great many men who did not do good work, and no doubt there would be many women who would do the same if they practised architecture, but the chance of getting good work was doubled, and for that reason alone the opportunity should be given to women to practise architecture.

Mr. F. T. W. Goldsmith said that Miss Charles had looked at the matter from the right point of view, viz., that in so far as a woman was intellectually fit to do architectural work, she should be allowed to do it, and that in her own way. Miss Charles did not say that every woman was qualified to be an architect, and while she pointed out that architectural atrocities had been perpetrated by men, she did not say that women would, taken as a whole, do better. So long as a lady architect remained single he saw no reason why she should not carry on the work of superintending the erection of her buildings just as a man did, and he thought it might in some cases be an easy matter for her to deal with the builder. A married man architect, as a rule, knew that a woman's resource in the management of her home had never been surpassed by a man in dealing with a contractor. At the same time the resource and management he referred to were exhibited in the privacy of home and not in public, on the scaffold, or in the midst of a number of workmen. He did not think that any woman would be able to tackle a contractor on the job, under the gaze of unsympathetic clerks of works, foremen, and workmen, in the same way that she was able to tackle her husband in her own domain, her home. That was one of the sex limitations which had been referred to. He could not help thinking that if women architects became as general as men are to-day, they would be a varying quantity. Sometimes there would be a great many of them practising, at other times, in the natural course of things, through marriage, there would be fewer. He did not think a client would appreciate the enforced absence of his lady architect from the work because she had a family and a home of her own to attend to, nor would he be willing to pay 5 per cent. to a lady architect who could devote only half her time to her employer's interests. That seemed to him to be another insuperable obstacle in the way of lady architects becoming general practitioners. It had been said that evening that lady architects would be very efficient in the work of an office, in decorative work, &c., and it was suggested that they should confine themselves to those duties. Now that course he objected to very strongly. An architect ought not to dissociate such work from the general outside work of his practice. If a lady architect were to do the decorative work and other work that had been mentioned, and the poor man architect were left to do the mere shell of the building, they would, perhaps, find by and by that the lady was doing the whole—and quite right too in those circumstances. What a lady might do if she wished to join the profession was to act as a sort of consulting architect, as was the case in America, he believed, and not to expect or be willing to act as architect in the ordinary way. If a lady architect would be satisfied with that there was a field open to her, and the profession would welcome her assistance. Miss Charles referred to a feeling against women architects. He was bound to say that there was a very strong feeling against them, and that he possessed that feeling, based upon practical experience; but that feeling was not against lady architects *per se*, but against unqualified lady architects — against those ladies who passed from designing decorative schemes, &c., into the practice of architecture without the proper qualifications, to the detriment of their clients and their work. In conclusion, he desired to add his testimony to Miss Charles for the fearlessness with which she had propounded her principles and for her excellent paper. He hoped that her career as an architect would be a successful and brilliant one.

Mr. F. W. Marks said that the only thing against ladies practising as architects with any success seemed to be their sex.

Mr. H. A. Satchell, in supporting the vote of thanks to Miss Charles for her excellent paper, said that in discussing whether ladies should enter this profession, or any of the few professions they had not already entered, one was sure to be met with the retort that one's objections were only the same or similar to those which had in the past been raised against the admission of women to other professions, and women could point with pride to the success they had achieved in the professions of medicine and law. He thought the objections to ladies practising as architects were not made from any selfish point of view, for it would be unkind of men architects to let ladies who were anxious to enter the ranks of architecture think that the profession was a bed of roses, and he was glad that the sex difficulty had been alluded to. As to dividing up architectural work, as had been suggested, he thought that would be very undesirable. There was sure to be more and more specialism as time went on, but it would be a great mistake to call ladies architects if they were to be mere specialists. All would feel sympathy with ladies who studied architecture in order to take an intelligent interest in the work of their male friends, for it added to domestic enjoyment when an architect's wife could discuss her husband's profession with him in an intelligent way. There was one way out of the difficulty, and that was collaboration, as suggested by Sir Walter Besant in reference to novel-writing. Sir Walter contended that lady novel-writers' as a profession, were a failure, but that the highest success in that sphere was obtained by collaboration—the collaboration of man and woman. That arrangement, however, according to Sir Walter Besant, was unfortunately not always a success, because it often ended in marriage, after which the lady had no time, and yet she objected to any other lady taking her place.

The Chairman, in putting the vote of thanks to the meeting, said they all knew how qualified Miss Charles was to speak to them. She had been through the whole student's course for qualification as an architect, and she had passed the Institute of Architects examination, and for that reason they could not lightly set aside what she had to say to them. It was remarkable that they should be asked to recognise the admission of ladies to be competitors with them in such a highly technical art as architecture; and it was an important subject, not only because of the novelty of the proposed departure, but also because of the large preponderance of women over men in this country. A very large number of young women had no object in life at all of an intellectual character, which was a very sad fact, and it would be a delightful thing if some of them would, or could, devote themselves to a study of architecture; whether they practised it in the future or not. From that point of view he thought they should encourage the study of architecture among women. It would add enormously to women's interest in life, for the intellectual field an architect had to travel before he was qualified, and the delights which that knowledge would give, were enormous. Moreover, if she remained single it would be the means of providing her with a livelihood, and if she married an architect she would be able to enter more into her husband's life and work than she could at present. Although it might be said that women had been emancipated intellectually for centuries, it was only about fifty years since that they had been really educated, and now they were carrying off some of the first honours at our universities, while in America they practised as consulting architects. They could not but feel sympathy with Miss Charles's views, and possibly they might find them become more general in the future. Perhaps the most important point touched upon in the whole discussion was the essential difference between men and women, and the difficulty of men dealing with women in business matters exactly on the same footing as they would with men. While the spirit of chivalry remained—and long may it remain—it was difficult for a man to

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treat a woman exactly as he would a man in any matter of business. Moreover, it was quite conceivable that some women would take advantage of a man in such circumstances. The question of the admission of women to the study of architecture in the Association had been discussed under the presidency of Mr. Mountford, when one or two ladies were nominated for membership. The Committee came to the conclusion that ladies should be admitted to the classes of the Association as students; whether they were to be given the whole run of the privileges of the Association was another matter. The Committee thought it would be to the advantage of the Association, and it must not be forgotten that ladies were admitted to all the classes of the polytechnics, associating on common grounds with the men in those classes. When the Committee's views were placed before a general meeting of the Association, however, those views were rejected. Perhaps the members of the Association thought that women would be important competitors, and that they would be willing to take less than the usual commission for their services. That always had been a difficulty with women's work in the open market. He was sorry that Miss Charles weakened her arguments by stating that women never had been creators or designers, for that was the whole question before them that evening. He quite agreed with her that there were few women who had achieved renown as musical composers, but as decorators they had come very much to the fore in designs for wall-papers, fabrics, metal-work, &c. Considering how recently women had entered these branches of work, the results pointed to successes in other directions. One point which should be remembered was the probability that if women were admitted to the profession, or to certain departments of it, the public would be more quickly influenced in matters of taste than in any other way. Women had far more opportunity than men for putting their views on such subjects before the public generally, and the great stumbling block in the way of progress in architecture was that the public were so unappreciative of art, especially the art of architecture, which was not taught, even scarcely hinted at, in any of our public schools or universities.

The vote of thanks was then put to the meeting and very warmly agreed to.

Miss Charles, in reply, said very little remained for her to say, for one speaker had answered another. Her paper was said to be not conclusive. How could it be? She had no proof to offer, and one must have proof if one wanted to be conclusive. For 6,000 years women had been sat upon by men, and they could not all of a sudden show what they could do; they must be educated up to it.

The Chairman announced that the next meeting would be held on March 7, when a paper would be read by Mr. J. Miller on "The Glasgow Exhibition."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

II.—ROYAL COLLEGE OF SCIENCE AND VICTORIA AND ALBERT MUSEUM, SOUTH KENSINGTON.

ON the 15th inst. the second spring visit of the session of the Architectural Association was paid to the Royal College of Science and Victoria and Albert Museum, South Kensington. A large number of members met at the Royal College of Science opposite the Imperial Institute, where Mr. Aston Webb, the architect, kindly met the party. A plan of the building had been put up on a screen, and Mr. Webb explained the various difficulties and requirements of the scheme. The site occupies practically the same length as the Institute and the main entrances are axial to each other.

The whole scheme is full of intricate detail on account of the many requirements of experimental science, one of the difficulties being the necessity of eliminating all ironwork, which would have a disturbing effect upon the delicate instruments in use. To illustrate the importance of attention to detail, Mr. Webb explained that it was found necessary to make quarter scale elevations of every wall of every room, as well as plans of floor and ceiling, in order to determine and show exactly how and where each pipe and appliance was to be placed.

The accommodation comprises lecture theatre for demonstration work, chemical and physical laboratories, classrooms, galleries in which various instruments will be placed for public inspection, and Professors' quarters, &c. Special provision has been made for the most accurate scientific experimental work of various kinds, and the arrangement of concrete vaulting over these rooms was examined with much interest. After most careful consideration, it was decided to adopt the Plenum system of ventilation and warming, and to a certain extent this seems to have had considerable influence on the plan. Warmed and purified air will be forced in by two sets of 9-ft. fans placed in the basement at each end of a long corridor which runs from end to end of the building, the corridors being made use of for the hot air passages. Inasmuch as the lowest of these in the basement will be under the ground floor corridor, and as the rooms on either side are of considerable height, the upper part of the corridor will on each floor be used for the air duct. These ducts will have hollow walls and will be lined with glazed bricks and paved with tiles, laid and pointed as neatly as possible to minimise dust, and they will be of sufficient height to enable people to walk through and keep them thoroughly clean; light will also be admitted by double windows to areas. Short flues will be formed in the walls from the duct to the various rooms, the flues being built in Fletton bricks neatly pointed. The air is admitted near the ceiling of each room. Provision is made for mixing cold and heated air, to obtain a heat of about 60 deg. on entrance to the rooms.

As the building is only in a very early stage it is not possible to give any description of the general architectural effect, but enough was seen to convince every one that all possible care has been taken to give the scientific workers of the nation a habitation worthy of their work.

It should be noted that the Government have made special arrangements for the supply of the Portland stone which is being used on both of Mr. Aston Webb's great buildings, one quarry being entirely devoted to the work, and every stone being passed by the Government inspector before it leaves the quarry. Great care also is being taken to prevent the discolouration of the face of the stone by Portland cement.

After Mr. Aston Webb had conducted the party over the whole site, explaining and noting interesting things by the way, a move was made to the new museum buildings in Cromwell-road. Here, also, the clerk of works, Mr. Tanner, had arranged a ground plan on a screen, and Mr. Aston Webb explained the general outline to the party. Some alterations have been made from the original competition plan, and though the building has little more than foundation work completed at present, much useful information was gained.

The side-lighted galleries, comprising three floors, facing Cromwell-road, are set out on a curve following the curve of the road, and the difficulties of the angle at the south-west corner are very cleverly got over in consequence. Behind these galleries is placed the great main court, some 700 ft. long, 50 ft. wide, and 50 ft. high, with a semi-circular apse at each end. The ultimate effect of this must be fine. The entrance in the centre to Cromwell-road is surmounted by a tower. The whole of the site is covered with splendid gravel, and when the foundations for this tower were got out it occurred to the architect that it would be well to find out how far this gravel extended. It was found that at one end only 7 ft. of gravel remained between the bottom of the excavation and the London clay. It was, therefore, decided to excavate the remainder, and it was then found that the clay was dipping at a sharp angle, and at the other end of the tower was 30 ft. lower!—a good illustration of the necessity for the utmost care in foundation work. The Plenum system of ventilation will be used, but radiators will be placed in the galleries.

The interior walls will be lined with Cranham bricks and plastered. These bricks give a good fixing for wall exhibits. Externally, brick and Portland stone will be the materials, terra-cotta having fortunately been discarded in favour of the more certain weathering qualities of Portland stone.

Members of the Association will, no doubt, keenly look forward to the future visit so kindly promised by Mr. Aston Webb. It is scarcely too much to say that the whole building is magnificently planned, and its completion will at last give the country a fitting home for the priceless treasures it possesses, and it is indeed a fortunate thing for the nation that the building of this, the greatest art museum of the Empire, should be in such capable hands.

ARCHÆOLOGY IN LONDON: A PASTIME FOR A BUSY MAN.

UNDER the above title Mr. Edwin Freshfield, LL.D., delivered an interesting lecture at the London Institution, Finsbury-circus, on Monday evening last. Prefacing his remarks by saying that the lecture was founded partly on his own experience, Dr. Freshfield said that when he was about ten years old an extraordinary wave passed over England. It was one of the phases of the great tide in favour of mediæval revival which set in with Sir Walter Scott and found its great triumphs under Sir Gilbert. It was a mania for rubbing monumental brasses. He (the lecturer) came into the whirlpool, and, assisted by his brother, who was older than himself, became with him a very ardent brass rubber. That practically settled the direction of his relaxation for the rest of his life, to be the study of history and antiquity—not that it began and ended in brass rubbing. The earliest monumental brass now remaining in England was in Surrey, at Stoke d'Abernon, near Leatherhead, the date of it being 1277. The latest would be difficult to fix, but it would be safe to put it about 1650. So that these two monuments covered a space of, roughly, 400 years. The main collection of brasses in London were in the churches of St. Helen's, Bishopsgate, and All Hallows, Barking, but there were others in several of the churches not destroyed at the fire, and together they formed a representative collection of smaller brasses of the fifteenth century and onwards, consisting of priests, knights, citizens, and ladies. By far the most interesting were in Westminster Abbey. He recommended to the attention of his hearers interest in monumental brasses, for in preserving them they were preserving valuable history. The visiting of churches for the sake of rubbing brasses naturally led, said the lecturer, to the visiting of the churches for themselves, and he would like to say a few words as to how an antiquary might, without going out of the limits of a two-shilling cab fare from the Bank, see examples of a great many of the various styles of architecture prevalent in England. Dealing first with the Roman period, there were, he said, some remains of Roman architecture, mainly in the city walls. Whenever those were excavated to a sufficient depth, and that was from time to time happening, the original wall with the Roman construction of stones with bands of brick was found. The last and almost perfect specimen which was uncovered was near the Money Order Department of the Post Office, close by the Church of St. Botolph Without, Aldersgate, but from time to time other portions were uncovered. He believed that the portion at Aldersgate was preserved—he knew a promise was given that it should be so—but the process of uncovering occurred from time to time, and an antiquary might reasonably hope to see a portion of the wall uncovered to the bottom. There were portions of it still visible above: a considerable portion in the churchyard of St. Giles, Cripplegate, a small portion in the churchyard of S. Alphage, and another portion near All Hallows in the Wall. There was a great deal more when he first began. Pavements were constantly being discovered, and an antiquary ought always to mark the site. Of Saxon architecture there still remained some portions of old buildings of the Confessor at Westminster. One of those buildings, about which, however, he believed some doubt had recently been raised, was the chapel of the Pyx. That building was not easy to be visited; it required a special order from the Chief Commissioner of Works, which in former days was not readily granted, though the fact that the chapel was no longer used for the special purpose for which it was employed, viz., a sort of treasure house, ought to render the possibility of visiting it more easy. The next building in order of date was undoubtedly Norman. It was the chapel in the Tower. That was the most perfect specimen of very early Norman work, not only in London, but he should think

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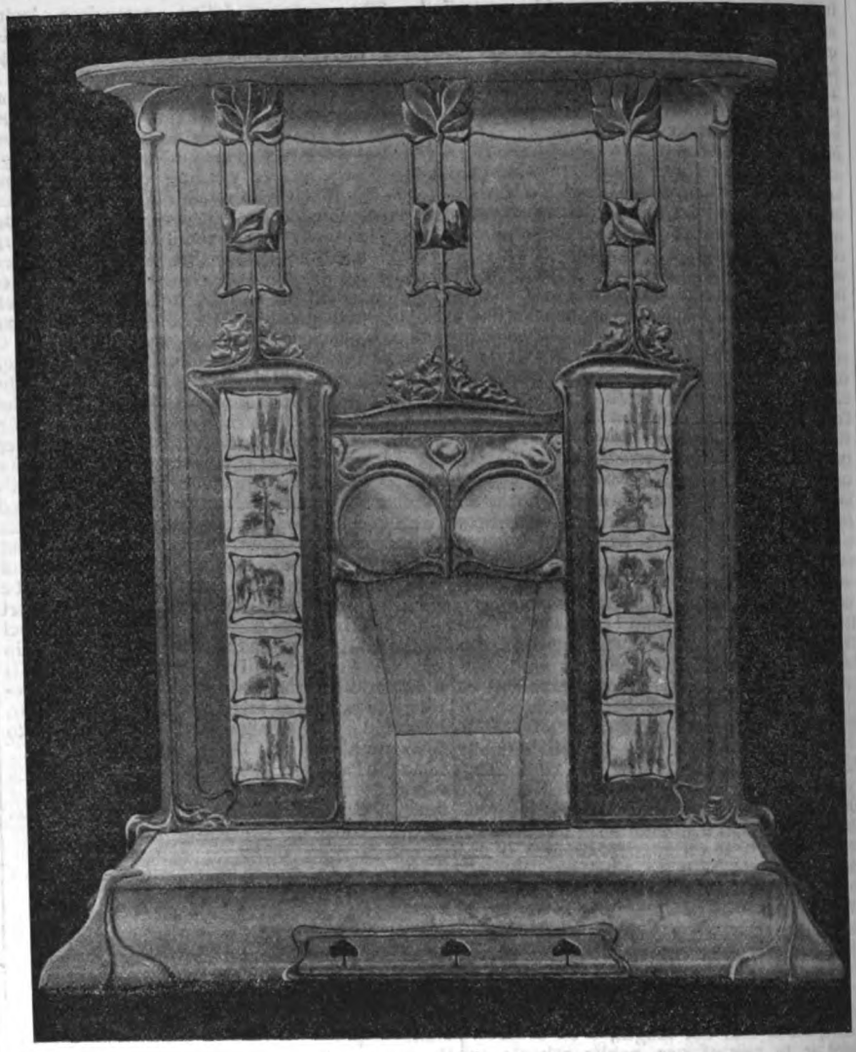
anywhere in England. It had never yet been touched, it had never been restored, and they would have to go to Normandy itself to find a building exactly like it. It consisted of a nave with an aisle, with a semi-circular apse at the end. The capitals of the pillars, too, pointed to a very early date. The next building in order of date was the crypt under Bow church, also in part Norman. That crypt was always accounted to be Norman, but there were some peculiarities about the walls which made him think that it was partly Saxon, or perhaps Saxon built with Roman bricks. Anyhow, it was a very fine specimen of early work, and as it had always been treated as Norman, it might be treated as such. There was a peculiarity about the crypt in that it was square at the east end. A fragment of another building might be seen which also fell before the end of the eleventh century, viz., a portion of the outer west wall of Westminster Hall. That building was built by King Rufus. The hall was practically rebuilt in the time of King Richard II., but a large portion of the old wall was left and still remained; and when the law courts, which abutted on the side, were being pulled down about twenty years ago, the Norman work was plainly visible. It was easily distinguished from the later work by the difference of the colour of the stone and the tooling, and by the fact that all the Norman work was covered with the masons' marks of the period. The next building, which fell into the next century, was also Norman—the Priory Church, now the parish church of St. Bartholomew the Great. That, like the church in the Tower of London, ended with an apse. That building showed an advance in decoration on the work in the chapel in the Tower, but there was a strong similarity between the general features and the arrangement of the two buildings. The next three buildings which fell into that century were the round part of the Temple church and crypt, and a small portion, which remained, of the round church of the Knights of St. John of Jerusalem in Clerkenwell, and the church of St. Saviour, Southwark. The Temple church that we now knew was called in the old records the new Temple. The old Temple was situated in Southampton-buildings, near to the Holborn end of Chancery-lane. Some years ago, when the houses between Southampton-buildings and Chancery-lane were pulled down, the foundations of the old church, a round church, were visible. The Temple was removed from Southampton-buildings to the present site, and the new church consecrated, in the year 1185 in the reign of King Henry II. It was quite clear from an examination of the buildings of the Knights of St. John of Jerusalem at Clerkenwell, that there was an earlier church there also. The existence of a round church was never suspected until two years ago, when the present rector, Mr. Woods, with the energetic churchwarden, Mr. Fincham, on clearing away the western end of the crypt for the purpose of making an entrance, discovered sufficient of the remains of the round church to be able clearly to identify it and its size. From the manner in which this round church was applied to the crypt, it was quite clear that that was an addition, and that as in the Temple Church, so in the Church of St. John at Clerkenwell, there was an old church to which the newer round church was added. As a fact, both the Temple and the Church of St. John were consecrated in the same year by the same prelate, Heraclius, Patriarch of Jerusalem, and therefore the date could be accurately fixed. In passing, it was worth remarking that the Angevine stonework of the building of the Hospitallers was covered with masons' marks, in the same way as the wall of Westminster Hall, to which he had referred. The next building, which he took to be only slightly later in date, was the Church of St. Saviour, Southwark—St. Mary Overy. The chancel of that church formed a very beautiful specimen of what was called Transition Norman, but which he had called Angevine architecture, and about that church there was a very interesting feature. There was a very peculiar ornament of a leaf description round the arcade of the church. A similar ornament might be seen at New Shoreham Church, in Sussex, at Reigate, in Surrey, and there were features which, he thought, showed that those three, together with the church at Carshalton, were all built by the same architect. If one drew a line from Shoreham to Southwark, they would find that it passed nearly straight through those two towns. It seemed to him not a monstrous suggestion that the same gang of builders were employed in the four churches, and that they went straight from Shoreham to London. But there was something still more interesting about this ornament—he did not know any other place in England where it was to be found, but it was very common in the East, and might be found as a decoration in the group of churches built in the neighbourhood of Antioch round the great church of St. Symeon Stylites. Coming to the reign of Henry III. in the thirteenth century, Mr. Freshfield referred in detail to the beautiful three-aisled church of the Templars, which was added on to the round church of Henry II.'s reign, and to the still more beautiful building, the Chapter House at Westminster Abbey. This latter building should be compared with the Temple Church, and the extraordinary advance in architecture between those two dates—1185 and 1250—was especially remarkable. Westminster Abbey, which was in some respects by far the most interesting building, not only in London, but in England, was rebuilt in the reign of Henry III. It was not built by an English architect, the arrangement was entirely French, and the design was no doubt French, but that did not prevent the church being a perfect storehouse of the most beautiful details of Gothic architecture; and the Abbey alone, if there was no other building in London, would itself almost provide examples of every style. Coming to the reign of Edward I., the lecturer said that the most magnificent specimen of architecture of that period—the old east end of St. Paul's—was unfortunately destroyed at the fire. There was one small, but beautiful specimen of this style, a church now, alas, lost to us—the Chapel of Ely House, in Ely-place, supposed to be built by Prior Crawden. Considerable portions of the Tower of London were built at this time, and notably Traitor's Gate, which was an arch without a keystone built in a style very common in the East, where it was used to provide against destruction by earthquake, but not so common in England. The succeeding style, which they called the Perpendicular, commencing with the reign of Richard II. and ending with that of Richard III., had the largest number of ecclesiastical and civil buildings. The nave of Westminster Abbey was a remarkable instance of a Perpendicular building made to accommodate itself to the earlier French style. Westminster Hall was a beautiful specimen of domestic architecture; the Guildhall, and most of the churches in the City which escaped the fire, were also examples of this style. He thought he had said enough to show that in the realm of architecture the citizen who took up antiquities as a study would have no difficulty in finding interest and employment. Having referred to the architectural features of the principal City churches, the lecturer gave some most interesting historical particulars of London life which he had gathered from the parochial records of the City of London. In concluding, Dr. Freshfield commended antiquarian studies, particularly to a quiet contemplative man, who, he said, could get abundant employment therefrom. They were interesting in themselves and were a species of continual education. The longer one studied, the more one found to learn. For an antiquary must be thorough, and of all things seek for the truth. They might never make a great discovery—that was given to few; but they might always be recording facts which would fall into their places in the general history of the world. Nothing that an antiquary did was ever lost.

The lecture was illustrated with lantern slides.



Design for a Fireplace. By Mr. A. Harold Smith.

DESIGN FOR A FIREPLACE.

THE above design for a fireplace is produced in cast-iron, with ornament in low relief, and has been designed and modelled by A. Harold Smith for the Teale Fireplace Co. The panels at the sides are arranged to admit five 6-in. tiles treated in a style to suit the whole design. The hearth is partly fireclay, with a tiled surface,

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and is surrounded by an iron fender 6½ in. high; this height is rendered necessary in order that the hearth may form a front for the fire, which is sunk 3 in. below its level and burns in a grate beneath which is an ashpan, easily removable through the front of the fender for taking away the ashes whilst the fire is still alight. A. HAROLD SMITH.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Battersea Borough Council 6,200*l.* for electric-light installation and meters; Stepney Borough Council, 678*l.* for street improvement; Woolwich Borough Council, 6,000*l.* for purchase of electric-light undertaking; Poplar Borough Council, 720*l.* for underground convenience; and Shoreditch Borough Council, 20,000*l.* for electric-light installation.

The Works Department.—The same Committee submitted the following report:—

"The Council has before it a report from the General Purposes Committee recommending certain changes in the arrangements for the control of the Works Department. The financial control of that department has been delegated by us to a standing sub-committee. The sub-committee have informed us that their experience leads them to the opinion that the best method by which the Council could execute its own works would be to place the responsibility for the execution of those works in the hands of either the Architect or the Engineer, according to the nature of the work to be executed. The sub-committee have been in existence for nearly five years, and considering the experience which they have gained during that period we think it our duty to lay before the Council the opinion at which they have arrived.

A long debate then took place on the following recommendations of the General Purposes Committee:—

"(*a*) That an advertisement be issued inviting applications for the appointment of Manager of Works, and that the salary to be attached to the position be 1,500*l.* a year, as at present.

(*b*) That a standing Committee, consisting of seven members, be appointed for the supervision of the Works Department, and that such committee be styled the Works Committee."

Sir John Dickson-Poynder, M.P., moved, as an amendment: "That the Works Department should only be continued for the purpose of completing the works in hand, and no new constructive works be undertaken, and accordingly that it be referred to the General Purposes Committee to report fully as to the appointment of a temporary manager." He said the Report before them was characteristically meagre in dealing with so important a subject. He presumed that the recommendations implied that the Works Department was to be maintained in its entirety in the future. His proposal was that a Works Manager should be employed temporarily. He wanted to make it quite clear that he did not wish to interfere with the proper carrying out of the duties of the Works Manager as long as there was outstanding work to be done. If he had his own way, so grave did he consider the matter, and so unsatisfactory had it proved, that he would wind up the Department to-morrow. But, of course, that Department had developed, and was a large undertaking, and could not be wound up in a day. Besides that, nearly 750,000*l.* worth of work was now being carried out by the Department, and he proposed that they should all co-operate together to carry out that work on the clear understanding that no new work should be placed with the Department. He contended that such a winding-up could be carried out without abnormal expense, and certainly the cost would pale in comparison with the expense of continuing the Department. He was opposed to placing the work under the Architect and Engineer, as some members proposed, because the appointment of a Manager was the only check over the Works Department. Three points were advanced by those who advocated the system of direct labour of this kind; (1) it prevented a ring of contractors artificially putting up prices; (2) that the maintenance of the Department prevented the undue pressure of labour under the contract system, and (3) that the Council should have such a department so as to secure to the ratepayers the contractors' profits. As to the ring of contractors, there was no evidence of anything of the kind ever having taken place among the contractors employed by the Council. But even if it had been possible for the London builders to combine for such a purpose, there was nothing to stop the Council going to builders outside the county—anywhere in the country, in fact. It seemed folly to say a ring had been formed when there was such a large open market. As to undue pressure on labour under the contract system, that could not honestly be said in view of the conditions of contract in force under the Council, those conditions being extremely rigid. He strongly contended that the contract system could not be said to encourage undue pressure on labour. The third argument was purely theoretical, and it was unnecessary for him to argue against it as a profit had never been made by the Department. The Council's whole experience showed that contracting was satisfactory and direct employment a failure. In the last five years the Department had carried out 700,000*l.* worth of work for the Housing Committee, and the excess over the measured value and the detailed prices of the officers was no less than 65,000*l.* But the officers' prices were based on the fact that there would be a profit to the contractor, so that not only did they lose the theoretical profit, but they lost 65,000*l.* which was irrecoverable. On the other hand, contractors had carried out 187,000*l.* worth of work for the same Committee, and the saving on the officers' estimates, based on the quantities and detailed measurements, was over 15,000*l.* They would be told that there had been bad management, but they had always made a failure, and he considered they had enough experience now to make it perfectly clear that the contract system was the best. With regard to the Labour members, of course one of their functions was to safeguard the interests of the workpeople and the Trades Unions. There was a vague idea running through the Trades Unions that the conditions under which they worked for the Works Department were preferable to those under the contract system. The Labour party were not there to be led by the Trades Unions, but they should lead the Trades Unions, and he asked them to acknowledge that they had so far backed the wrong horse, and that in the interests of London it would be better to revert to the contract system. He was convinced that a gigantic labour bureau controlled by a Municipality was impossible.

Mr. Beachcroft seconded the amendment. He did not intend to "pile up the agony" by further exposing the failures of the Works Department, but he would point out that the Department had been no happier in dealing with engineering than with building works. The Council had now come to the meeting of the ways, when they must either mend or end the Department. He did not think that making the architect or engineer responsible would be a success, because that would leave the Council without any direct check. The alternative was the re-appointment of the Works Committee, who were to be the directors of this gigantic municipal enterprise. He predicted that they would again fail, as they had failed in the past, because they had no inducement of gain before them, such as railway and other directors had always in view. He was driven to the conclusion that in the interests of the ratepayers the Council should at once cut the loss. Were the Council to carry on this huge business at a continual loss, merely for the sake of the privilege of employing 2,000 out of the 200,000 workmen and labourers employed in the building trade of London? Advisedly, he said "No." The Council should recognise that discretion was the better part of valour, and should give up the impracticable experiment of the Works Department. It could not be said that the Department had been starved. In 1898-99 the value of the work undertaken by the Department was 216,000*l.*; in 1899-1900 it was 164,000*l.*; in the next year it was 344,000*l.*; and in the first half of the past year it was 147,000*l.*

Earl Carrington thought there must always be a danger of contractors forming a ring against the Council. The remount and meat scandals showed the necessity of a Works Department in connexion with the Government, and he believed that the Council, with a reconstituted Works Department, would be able to show a saving and a secure service. He defended the principle of the direct employment of labour, believing it to be in the best interests of those whom the Council represented.

Sir Arthur Arnold thought that the past five years' management of the Department under the Finance Committee was a huge mistake. With regard to Sir John Dickson-Poynder's statement that there had been a loss of 65,000*l.*, he denied that there was any foundation for it. They had always given four or five times more work to contractors, and until they could compare the accepted tenders of the contractors with the officers' prices they could not say there had been a loss. He believed the Department had a useful future before it, and he asked for one more trial for it under a Committee.

Mr. A. T. Williams remarked that the Department had failed with architectural work and with engineering work, and now they heard that jobbing work could be done at a considerably lower price than at present. Therefore, he considered there was no case for further trial.

Mr. Bruce said he could see no reason why the Works Department under a new Committee and with a new Manager, and aided by experts in architectural and engineering works, should not prove successful.

Lord Welby, Chairman of the Finance Committee, pointed out that in regard to estimated works executed by the Works Department during the past four and a half years, the total amount given to the Department was 466,000*l.*, calculated on the final estimates. Those works actually cost 473,000*l.*, or an excess of 7,000*l.*, but it should be mentioned that if they removed from the total the North Woolwich drainage, upon which there was an excess of 16,000*l.*, there would have been a saving of 9,000*l.* If they added to the totals the jobbing works carried out during the same period, they found that the total estimates came to 601,950*l.*, and the actual cost to 602,327*l.* That only showed an excess of 377*l.*, or 8d. in every 100*l.* That was a result of which they need not be ashamed, and before taking the serious step of abolishing the Department, the Council should pause and consider whether, after all, the Department had not something to say for itself.

Mr. Cohen supported the amendment. Their experience of the Works Department had been not only unfortunate, but almost disastrous.

Mr. M'Dougall said it was very difficult to discover whether the Council were losing by the Works Department. His opinion was that the Council had gained immensely by it. The improvement in the work done by contractors for the Council during the past ten years was due to the creation of the Works Department.

The amendment having been defeated by a large majority,

An amendment by Mr. Sears, to appoint an Advisory Committee to consider the question of the reorganisation of the Works Department prior to the appointment of a new Works Manager, was moved and lost.

Mr. E. White proposed a further amendment to substitute 1,000*l.* for 1,500*l.* He remarked that the Department was over-capitalised, and, whoever was appointed, the losses would continue. He believed that that day the Department was going to embark on a third and final stage.

Mr. Steadman seconded the amendment. The Department was overburdened with expense, and it was quite possible to get a good manager for 1,000*l.*

Mr. Dickinson said it was necessary to pay a good salary to get a good man. There was no doubt that the failure of the department had been largely a personal one, for, unless it was felt that the post was a permanent one, the best men would not apply.

On a division, the amendment was defeated by 73 votes to 41.

The Council then divided on recommendation "*a*," which was carried by 76 votes to 39.

Mr. W. Peel moved on recommendation "*b*" an amendment to refer it back for further consideration.

Mr. Sidney Low, in seconding the amendment, remarked that the leaders of the Progressive party ought to have given them some little more explanation of what they were proposing, and the main reason why he supported the amendment was because no explanation had been forthcoming for their remarkable change of policy. Up to that afternoon they had been given to understand that the Works Department was regarded as a great success, and it was only that afternoon

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they hea d to the contrary when his friends developed their attack.

The amendment was defeated, and the recommendation was carried by 82 votes to 26.

The Architect's Department.—The Establishments Committee recommended and it was agreed—

"(*a*) That authority be given for the retention for a further period of six months of the services of the ten assistants on the unestablished staff whose services were authorised on December 10, 1901, and for the employment of additional assistants on the unestablished staff in the general constructional section of architect's department at a total expenditure, including the pay of the ten assistants referred to, of not exceeding 100*l.* a week.

(*b*) That authority be given for the expenditure of a sum not exceeding 450*l.* for providing tables, fittings, cost of removal, and provision of artificial light in some of the rooms at 19, Charing Cross-road, in connexion with the employment of the staff referred to above."

Strand Widening and New Street from Holborn to Strand.—The Improvements Committee reported as follows :—

"In connexion with the Strand Improvement, authorised by the London County Council (Improvements) Act, 1897, and the Holborn to the Strand improvement sanctioned by the London County Council (Improvements) Act, 1899, considerable progress has been made, and we desire to report as to the extent of the work already completed.

As soon as the Acts in question were obtained, we served notices to treat in respect of the property in the Strand needed for the improvements, and commenced negotiations with the owners with a view to the acquisition of the land. Every effort has been made to expedite the improvements, and the Council is now in possession of practically the whole of the property between Catherine-street and the Law Courts on the Strand frontage, as well as the whole of the land between Holywell-street and the Strand. Nearly all the houses have been demolished, and considerable progress has been made with the sewer, subway, and paving works.

During the acquisition of the property, we gave much consideration to the important question of the arcitectural features connected with the improvement, and we consulted the Royal Institute of British Architects in the matter. The Council, upon our recommendation, obtained from eight selected architects suggested designs for the elevations of the buildings proposed to be erected fronting on the Strand and on the crescent road to be formed between Wellington-street and Clement's Inn.

It will be within the recollection of the Council that the Act of 1899, which authorises the construction of the new street from Holborn to the Strand and the widening of the Strand east of Wellington-street, makes provision for the reinstatement of the Gaiety Theatre, Gaiety Restaurant, and Messrs. Shorts, Limited, at the western end of the site which will be formed between the new crescent road and the Strand, and the Council has given its approval to a design by Mr. Ernest Runtz, based upon Mr. Norman Shaw's sketch design, for the elevation of the new theatre and restaurant, proposed to be erected on the site in question, and the company have made much progress with the foundation work for the new buildings.

The Act of 1899 also makes provision for the reinstatement of Carr's restaurant on the north-eastern frontage of the proposed crescent road close to the Law Courts, and the Council has approved an elevation for the new restaurant.

The work of forming the new street from Holborn to the Strand and clearing the insanitary area at Clare Market is being undertaken as one scheme. In the Clare Market area about 3,038 persons of the working class were displaced, and the scheme sanctioned by the Home Office was that accommodation should be provided for 750 persons on the cleared land at Clare Market, and for 1,500 persons at Millbank. For the new street about 3,700 persons of the working class will be displaced, and the scheme sanctioned by the Home Office is that accommodation shall be provided as follows : 250 on the Duke's-court and Marquis-court sites, 790 in a lodging-house in Drury-lane, 1,081 on the Reid's Brewery site, 680 on the Herbrand-street site, and 200 at Millbank.

In carrying out the complete scheme of improvement it will be necessary to acquire in all forty-nine licensed houses, and the Council has decided to continue the policy hitherto maintained, and to abandon these licences.

The work of widening the Strand has involved the acquisition of portions of the churchyards of St. Mary-le-Strand and St. Clement Danes. The Act requires the Council to undertake the removal and reinterment of all human remains which may be found in the parts of the churchyards required for the improvement. The Council accordingly made arrangements for the removal of the remains and their reinterment in the consecrated portion of Brookwood Cemetery.

The work of excavation for the sewer in the Strand and the work of constructing the sewer has been almost completed, and more than half of the subway for pipes, wires, &c., has been formed. The paving work is well in hand, and it is expected that all the work connected with the widening of the Strand will be completed in May next, and we hope in the course of a few months to be able to form the new crescent road which will commence at Catherine-street and will re-enter the Strand close to St. Clement Danes Church."

The Council adjourned shortly before eight o'clock.

Illustrations.

ADDITIONS TO BROCKLESBY PARK.

THE eastern block of Brocklesby Park, the seat of the Earl of Yarborough, was completely gutted by fire in the spring of 1898. The old walls were very irregular on face, and all of them were battened, the battens being fixed to wood plugs built in, the result of which was that the space between plaster and walls acted as a flue, and it was impossible in consequence to master the flames.

The part of the house burnt dated from the early part of the eighteenth century, and built in to the walls were fragments of a sixteenth-century house ; but the arrangements of the old place were very inconvenient, and on rebuilding the plan was completely rearranged, only the old dining-room and staircases occupying the original position. A new drawing-room, 70 ft. long, was formed along the south side, and a new hall formed in place of the old drawing-room, with a new vestibule and front entrance, and the whole of the eastern block of the house was rebuilt.

The materials are small red bricks and Ancaster stone. In the vestibule the columns are monoliths of green Cippolino with statuary caps and bases, the paving being of Cippolino and Piastriaccia marble.

The general contractor for the works was Mr. J. A. Hunt, of Hoddesdon. The ceilings were executed by Messrs. G. Jackson & Son, the wood-carving by Mr. Bessant, and the stone-carving by Mr. Aumonier from the architect's drawings.

New terraced gardens on the east and south sides are now being formed from the architect's designs. The architect is Mr. Reginald Blomfield, of London.

HEARTS OF OAK SOCIETY'S OFFICES COMPETITION.

WE give the elevations and plans of the design, by Messrs. Essex, Nicol, & Goodman, of Birmingham, which obtained the first premium in the recent competition for new offices for the Hearts of Oak Benefit Society.

The design was described and commented on at some length in the review of the competition designs in our issue of January 11. We, however, applied to the architects for any further and more detailed description they might wish to give, but they have unfortunately referred us to the Report accompanying their design, which is not, of course, in our hands.

DESIGN FOR A LECTERN.

THIS design, by Miss S. Thompson, is one which obtained a silver medal at the last International Art Competition at South Kensington.

The whole work stands 5 ft. 2 in. high to the highest point, and is intended for cast bronze, but might be carried out in any other metal.

We give the general elevation of the front view, and larger drawings of some of the details.

COMPETITIONS.

OFFICES, DARTMOUTH.—The first premiated design in the competition for offices and dwelling-house, for the Channel Coaling Co., Dartmouth, was sent in by Mr. A. S. Parker, Plymouth. The second premiated design was by Mr. J. J. Smith, Bideford ; and the third by Mr. P. Kerley, Exeter.

BAPTIST CHURCH AND SCHOOLS, SOUTH BANK, YORKSHIRE.—The designs submitted by Messrs. George Baines, F.R.I.B.A., and R. Palmer Baines have been accepted for this scheme. The accommodation provided in the church is for 542 adults. The estimated cost is 4,380*l.*

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS.—At the ordinary meeting on the 13th inst. Mr. Charles Hadfield read a paper entitled "Notes on some South Yorkshire Churches." He said that his object in noticing the neighbouring South Yorkshire churches was to illustrate from their mode of plan and construction the state of technical education as regards building matters in England while the national architecture flourished. Mr. Hadfield proceeded to notice the following parish churches :—Rotherham, Treeton, Handsworth, Aston, Ecclesfield, Sheffield, and Laughton-en-le-Morthen, giving outlines of their history from Domesday and other sources, and describing by aid of plans which he had prepared the date and mode of their construction. The surveys of most of them were prepared during works of repair done by himself during the past thirty-five years. The influence exercised upon the art of the district by the great Archbishop Scott, or Rotherham, a native of either Rotherham or Ecclesfield, was pointed out, and allusion was made to his college at Rotherham and his work in rebuilding the church there.

BRISTOL SOCIETY OF ARCHITECTS.—The ordinary monthly meeting of this Society was held at the Fine Arts Academy, Queen's-road, on the 10th inst., Mr. Frank W. Wills (president) in the chair. After the routine business, a paper was read by Mr. Alfred H. Dykes, Assoc.M.Inst.C.E., M.I.E.E., on "Electricity as Applied to Buildings." The lecturer in his opening remarks said the field covered by the title was a very wide one, but he proposed to confine himself principally to the consideration of the alterations in the design of factories and works necessitated by the growing use of electrical energy and methods of distributing the current inside buildings. When electrical power was used in a works the various machines could be disposed exactly where found most convenient, without any regard having to be paid to the question of shafting. The whole building could be made lighter, and in the case of large works a central power-house with one or two large economical engines, and a battery of boilers equipped with mechanical coal and ash-handling plant, would take the place of a large number of scattered engines and boilers each requiring separate attention. Examples were given of two different classes of installations, the first a printing works, and the second a group of large mills, and it was pointed out that the electric method was the more economical in both cases, although the conditions were entirely different. In the first case the various machines were continuously being started and stopped, and the use of separate motors enabled any press to be run at any time without long lines of counter shafting having to be kept in motion, whereas in the second case the demand for power was constant, and the economy effected was due to the ability to use one concentrated power station with few units, thus securing the most economical engines and greatly diminished wages bill. Where space was limited it was possible, by using electrical driving, to dispense with the room otherwise required for engine and boiler houses and take current from a station somewhere outside the works, a good instance of this being furnished on the Tyne, where Messrs. Armstrong, Whitworth, Wigham Richardson, and other shipbuilders, being cramped for room, had thrown out their own engines and boilers and were now supplied with power from a public power supply company. After entering into a short explanation of electrical terms, the author next proceeded to trace the various methods which had been employed for distributing current inside buildings. Until recently vulcanised rubber was practically the only material used for covering wires conveying the current, and in dry situations it gave very little trouble. It could not, however, be relied on for use where it would be alternately wet and dry. The use of wires, insulated with paper and lead covered, and also with vulcanised bitumen, was touched upon. Wooden casing as a protection for the wires was fast being superseded by simplex tubing, screwed iron barrel, or brass tubes. Attention was drawn to the advantages of "concentric wiring," in which only the inner conductor was insulated, and the author described a modification introduced by himself, combining the advantages of the flexible concentric system with the ability to replace any faulty or

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damaged conductor without disturbing decorations or plastering. In conclusion, it was urged that the electrical work in a building should be started in good time, and not left till the structure was too far advanced.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The members of the Leeds and Yorkshire Architectural Society held their annual dinner at the Queen's Hotel on the 11th inst. Mr. Butler Wilson, the President, was in the chair. Mr. J. Hepper proposed the toast of "The Royal Institute of British Architects and Allied Societies," and observed that every man ought to have a high ideal in his profession. Unless his ideal was above himself, he had not the incentive to make the best of himself. Mr. Hepper went on to refer to the fortunate position of the architect who combined in his work both the capacity for scheming plans that were essentially practical and useful and the capacity of artistic designing at the same time, without additional cost. The President, who responded, briefly alluded to competitions. So long as architects had to start without clients and so forth, they must continue to go on the market, and find a start in life in the competition world. But they had a right to expect that the assessors in these competitions should be men who had had a practical experience in the particular class of buildings that was under consideration. Otherwise, their awards could scarcely give general satisfaction. Continuing, Mr. Wilson said that there was to-day a very strong movement in the direction of dealing with architectural problems in a quiet manner, and with a consideration for the requirements of their clients, without any regard to style or period. The advanced school had carried out this idea to an extreme degree. It appeared to him unreasonable that men should be asked to forget the architectural beauties of Yorkshire, for example. They must not be asked seriously to ignore the great store of knowledge which the world had placed at their disposal. There was no reason why they should not store themselves with this knowledge, and, at the same time, be prepared to deal with every architectural question put before them strictly on its merits. In conclusion, such societies as theirs, said the President, must, to be successful, be based upon unselfishness. Alderman Wurtzburg gave "The Leeds and Yorkshire Architectural Society," and incidentally, when speaking of the architectural improvements that had been effected in the city during the past few years, said that Leeds people used to be known as "loiners." In view of the number of arcades that had sprung into existence, he thought that Leeds might now be called Arcadia, and its people Arcadians. Mr. G. F. Bowman responded. In giving the toast of "The Guests," Mr. W. H. Thorpe deprecated the evils that the competition system brought with it. Architects were put to a great deal of expense, and with no return in the majority of cases. He suggested that the evil might to a certain extent be minimised if a system of limited competition were adopted, by which, say, half a dozen members of the profession would be invited to send in plans, the unsuccessful competitors to receive an honorarium for their work. The toast was responded to by Mr. J. W. Brooke.

DUNDEE INSTITUTE OF ARCHITECTURE.—On the 8th inst., Mr. Charles J. Menart delivered a lecture before the Dundee Institute of Architecture in the Technical Institute on "British and Continental Architecture," Mr. J. P. Bruce presiding. Mr. Menart said that in his travels abroad he had found that the various styles of architecture in their native countries were often beautiful, but they were something very different when taken to other countries without any attempt being made to adapt them to their new surroundings. The architect of the Wallace Monument at Stirling was a true artist, but the man who proposed to erect a copy of the Parthenon on the Calton Hill, at Edinburgh, was not, and it was perhaps fortunate that the latter building was not completed. The architects of Greece and Rome suited their buildings to the climate. Owing to the bright sunshine their buildings did not require much window space, whereas in this country some buildings were nearly all glass in front. The Gothic churches were intended for processional purposes, and were designed accordingly, but it was a mistake to copy them for a Presbyterian form of worship, where the sermon was the chief part of the service. Dealing with Scottish architecture, he said the baronial castles were the true expression of the country and its people. There had been talk of putting a crown on the Old Steeple, but he thought that would be a mistake, as the steeple was beautiful as it stood.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—At a meeting on Tuesday evening (the President, Mr. H. G. Luff, of Devonport, in the chair), a lecture on "Bacteria in relation to Sanitation" was delivered by Dr. Ransome Pickard, with illustrative diagrams and microscopic slides. After dealing with the classification of forms and reproduction of bacteria, the lecturer proceeded to describe their functions in the process of decomposition, especially with regard to the microbe action in the purification of sewage, as brought into play in the septic-tank treatment. Important points with regard to hospital construction were touched on, attention being drawn to the production of spores and the difficulty of dealing with them and of destroying some of the bacilli with ordinary means of disinfectants, and the precautions adopted in the modern operating theatres to guard against infection. Ventilation was discussed, and also the problem of sanataria, which is being daily more forced upon the attention of the public and the medical profession at large, who were, however, not quite decided as to the question of the best sites.

ST. CATHERINE CREE, AND ST. JAMES, DUKE-PLACE, UNITED BENEFICE.

THE Corporation and the Bishop of London, the Master and Fellows of Magdalene College, Cambridge, and the Ecclesiastical Commissioners have just ratified a scheme concerning this united benefice, of which Magdalene College and the Corporation are joint patrons, presenting an incumbent alternately. The measure relates to the application of a surplus sum of 2,015*l.* of a certain fund to the endowment or augmentation of the income or otherwise for the incumbent's benefit, a parsonage-house having been recently provided therefrom. The fund arises from the investment of three-tenths of the proceeds of the sale of the site, materials, and furniture of the Church of St. James, in Duke's, since St. James's-place, Aldgate, which was demolished in 1878, when the benefice was united with that of St. Catherine Cree, or Christ Church, in Leadenhall-street. The church was originally built in 1622 for the inhabitants of that quarter, who, since the dissolution of the priory of the Holy Trinity, or Christ Church, had been left with no place of worship in their midst. Their cause was zealously supported by Sir Edward Barkham, elected Lord Mayor in 1621; they addressed a petition to the King, who, it appears, *teste* Stow, suggested the dedication to St. James. The church was rebuilt in 1727, of brick, in a very plain style, and repaired in 1823; the tower had windows dressed with stonework from, it is believed, the former structure and the earlier priory buildings. Mr. H. W. Brewer's drawing, "Aldgate, A.D. 1531," published in our issue for January 2, 1897, delineates the Priory and Church of the Holy Trinity, founded for her confessor Norman, an Augustinian canon, and endowed with her yoke at Aldgate by Queen Mathilda (of Scotland) in 1108, on the site, it is said, of a church which Syder, or Suedyr, a canon of St. Paul's, had erected in honour of the Trinity and St. Mary Magdalene. The priory, suppressed in 1531, became one of the wealthiest in England. King Henry VIII. bestowed the buildings and precincts in 1534, upon his Lord Chancellor, Thomas Audley, Lord Audley of Walden, who, Stow says, pulled down the steeple (perhaps the western tower) and most of the church. He altered the monastic dwellings for his own residence, assigning a lodging therein to Holbein, and gave St. Catherine's to Magdalene College. Margaret, his sole daughter and heir, married, in 1537, Thomas Howard, fourth Duke of Norfolk; their son Thomas, Earl of Suffolk, sold the priory and Audley's mansion-house to the City of London and built Audley End with the proceeds in 1603; in 1650 Oliver Cromwell gave the Jews license to settle there. The *Home Counties Magazine* lately reproduced, with an article by Professor Lethaby, two very interesting and finely-drawn surveys made in or about 1592 by J. Symans, or Symonds, master mason at Dover Harbour, and preserved at Hatfield House, consisting of the "grownd plat" and "second story" of Cree Church with the buildings and precincts. St. James's Church, it seems, was built on the site of the chapter-house, about 56 ft. by 30 ft., which stood between the dorter and the north transept; Mitre-square represents the cloisters, and a court at the angle of Mitre-square, by the warehouses in the south-east of the square which have replaced St. James's Church, marks the site of the north transept.

PAINTING PRACTICES IN THE UNITED STATES.

A REMARKABLE paper on "The Composition of Paints and Pigments" has been communicated to the New York Section of the Society of Chemical Industry by Mr. Maximilian Toch. Many English builders and engineers will disagree with some of the conclusions drawn by Mr. Toch concerning the relative values of the different pigments, but his deductions are made from observations of the durability and covering power of the different paints on exposed buildings and structures, and are of a very practical nature.

The author of the paper discusses his subjects in the following order:—Red lead, white lead, zinc oxide, carbon blacks, oxides of iron, barium sulphate (natural and artificial), zinc sulphide, casein paints, Japanese or China wood oil, tar, benzine, turpentine, maize oil, linseed oil, and hydrocarbon or bitumen paints.

About thirty million gallons of mixed paint (ready for use) were sold in the United States in the year 1901, and, according to Mr. Toch, many manufacturers use a small quantity of water in their mixtures. This water is not regarded as an adulterant when the quantity does not exceed 2 per cent., and "the water used is usually slightly alkaline, and in the case of lime water it forms a calcium soap with linseed oil, and thickens the paint so that it never settles hard in the tin and is easily stirred."

Mr. Toch considers that the value of red lead has been much over-estimated, that it is only good on account of its high specific gravity, and that a paint consisting of 70 per cent. barytes, 10 per cent. carbon black, 10 per cent. zinc oxide, and 10 per cent. graphite, ground in pure linseed oil containing a sufficient quantity of driers, will outwear red lead.

It is stated that in June, 1899, the outside walls of a most exposed building in the city of New York were first coated with a hydrocarbon paint to close the pores of the brick, and that over this two coats of a linseed-oil paint were then applied, the paint being composed of 25 per cent. barium sulphate, 25 per cent. white lead, and 50 per cent. zinc white. The walls are still in perfect condition, no damp has penetrated, and no peeling or disintegration of the paint has taken place. It is claimed that "this proves that barium sulphate fills up the pores of linseed oil, and that this proportion of zinc oxide and lead carbonate, in which zinc oxide predominates, is the most suitable for that locality." It is also remarked that if paint will stand in the atmosphere of the Atlantic coast it will last much longer in the interior, for the best paint rapidly deteriorates at the sea shore.

In conclusion, Mr. Toch remarks that the statement that iron or steel imbedded in concrete cannot rust is incorrect, and that unless the metal be well coated with a varnish paint containing bitumen, it will rust and disintegrate; but that "clean steel, embedded in a coating of cement which is properly trowelled, cannot rust, even though subjected to the worst conditions."

BOOKS RECEIVED.

VELASQUEZ, HIS LIFE AND WORKS. By Hugh Stokes. (Art Record Press. 1s.)

CONDITIONS OF CONTRACT. By Frank W. Macey. (Sweet & Maxwell, and B. T. Batsford.)

CLAY'S SUCCESSFUL GARDENING: Second Edition. (Clay & Son. 6d.)

INVESTMENTS IN HOUSES AND LANDS. By R. Denny Urlin. (National Mutual Life Assurance Society. 1s.)

PROPOSED TOWN HALL, HAMPSTEAD.—It is stated that the Borough Council have under consideration a scheme for building a new town hall, at an estimated outlay of 40,000*l.* for the fabric. The present Vestry Hall, at Haverstock Hill, was erected after the designs of Messrs. H. E. Kendall and Frederick Mew, as joint Architects.

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APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Lewisham.—Houses in Brightside-road, Saravia-road, Elthruda-road, Nightingale-grove, and Mallet-road, Hither-green, Lewisham (Mr. G. Tolley for Mr. J Laird).—Consent.

Clapham.†—A detached house on the north side of Poynder's-road, Clapham, at the corner of Rodenhurst-road (Messrs. R. Price & Son for Mr. S. H. Poulton).—Consent.

Fulham.†—The retention of a shed in the garden at the rear of No. 77, Gunterstone-road, Fulham, abutting upon Glazbury-road (Messrs. Squire & Potter).—Consent.

Hampstead.—A wooden hood over the entrance to a dwelling-house in course of erection on the north-east side of Lindfield-gardens, Hampstead (Mr. W. J. King for Mr. H. W. Preston).—Consent.

Kensington, South.—A building on the eastern side of Warwick-road, Kensington, northward of No. 104 (Mr. W. A. Large for Messrs. Bishop & Sons).—Consent.

Lewisham.—Two houses on the south side of Brownhill-road, Lewisham, to abut upon Hither Green-lane (Mr. A. C. Baker for Messrs. Backhouse Bros.).—Consent.

Marylebone, East.—An iron and glass shelter at the entrance to Bechstein Hall, Nos. 36 and 38, Wigmore-street, St. Marylebone (Mr. T. E. Collcutt for Mr. E. Bechstein).—Consent.

Walworth.—An addition to the Town Hall, Walworth-road, Walworth, to abut upon Wansey-street and Ethel-street (Mr. A. Harrison for the Council of the Metropolitan Borough of Southwark).—Consent.

Westminster.—A portico at the entrance to a block of residential flats on the south-west side of Emery Hill-street, Westminster (Mr. E. J. Stubbs for Messrs. J Allen & Sons, Limited).—Consent.

St. Pancras, South.—That the Council's resolution of December 3, 1901, sanctioning the retention of a wooden facia and cornice fixed round the base of a projecting oriel window at the north-western angle of No. 28, Rathbone-place, Oxford-street, be modified in accordance with the request of Mr. P. Dollar, by the omission of words.—Agreed.

Dulwich.—A three-story bank building on the site of Nos. 64 and 66, and of one-story shops upon part of the forecourts of Nos. 60 and 62, Lordship-lane, East Dulwich (Messrs. R. C. Harrison & Son for the London Joint Stock Bank, Limited).—Refused.

Hackney, Central.—One-story shops on part of the garden of No. 45, Avenue-road, Clapton (Mr. W. Rainbow).—Refused.

Islington, West.†—One-story shops upon the forecourts of Nos. 85, 87, and 89, St. James's-road, Holloway (Messrs. Borges & Rumball for Mr. J. J. Jones).—Refused.

Lewisham.—Houses, with one-story shops in front, on the east side of Ardgowan-road, Hither-green, Lewisham, at the corner of Dowanhill-road (Mr. A. C. Baker for Mr. J. Harwood).—Refused.

Marylebone, West.—A stone portico at the entrance to No. 48, Bryanston-square, to abut upon Upper George-street, St. Marylebone (Mr. C. Young for Viscount Chelsea).—Refused.

St. George, Hanover-square.—Fixing of iron and glass screens on each side, and in front, of the shelter at the entrance to the Buckingham Palace Hotel, Buckingham-gate, St. George, Hanover-square (Mr. W. Woodward for the Buckingham Palace Hotel Co., Ltd.).—Refused.

Strand.—A building on the site of Nos. 27 and 28, Pall Mall and Nos. 24 and 25, St. James's-square, St. James's, with projecting balconies (Mr. F. E. Williams for the Wilkinson Sword Company).—Refused.

Width of Way.

Hackney, Central.—A one-story addition to a building in the garden of No. 97, Lansdowne-road, Hackney (Mr. A. Cook).—Consent.

Bow and Bromley.—The rebuilding of No. 180, Roman-road, Old Ford, with the external walls of the new building at less than the prescribed distance from the centre of the roadway of Dane-place (Mr. R. R. Bostock for Mr. C. J. Bone).—Consent.

Brixton.—A two-story house on the west side of Farmer's-road, Lambeth, northward of No. 86, with the external walls of such house at less than the prescribed distance from the centre of the roadway (Mr. A. E. Symes for Mr. C. Newbury).—Consent.

Chelsea.†—A billiard-room at the rear of No. 61, Cadogan-place, Chelsea, with the external walls of such billiard-room at less than the prescribed distance from the centre of the roadway of Little Cadogan-place (Messrs. Alder & Turrill for Mr. J. Turrill).—Consent.

Hampstead.—The retention of a summer-house in the grounds of the North London Hospital for Consumption, Mount Vernon, Hampstead, with the external walls of such summer-house at less than the prescribed distance from the centre of the roadway of the street (Messrs. Roff & Son for the Committee of the North London Hospital for Consumption).—Consent.

Space at Rear.

Fulham.—A modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of a building on the site of Nos. 67 and 69, New King's-road, Fulham (Messrs. Thorpe & Furniss for Mr. F. Bishop).—Refused.

Width of Way, Lines of Frontage, and Projections.

St. George, Hanover-square.—An oriel window and balcony in front of No. 7, Bolton-street, Piccadilly (Messrs. Cubitt, Nicholls, Sons, & Chuter for the trustees of the Sutton Estate).—Consent.

Marylebone, West.—A one-story addition and three stone steps at the rear of No. 21, Montagu-square, to abut upon Gloucester-mews West, St. Marylebone (Messrs. Smith & Brewer for Mr. G. Lewis).—Consent.

Kensington, South.—An oriel window at the first floor level in front of No. 26, Yeoman's-row, South Kensington (Mr. T. Lott for Miss E. McCallum).—Refused.

Rotherhithe.—A three-story warehouse on the south-west side of London-street, Dockhead, Rotherhithe (Mr. V. Dunkerley for Messrs. W. & R. Jacobs & Co., Ltd.).—Refused.

Wandsworth.—A one-story shop front at No. 253, Upper Richmond-road, Putney, at less than the prescribed distance from the centre of the roadway of Lower Park-fields (Mr. W. J. Renshaw for Mr. A. Gerhold).—Refused.

Lines of Frontage and Construction.

Bow and Bromley.—The retention of an iron and concrete timber-drying stage at Tredegar Works on the south-west side of Ordell-road, Bow (Messrs. Perry & Co.).—Consent.

Formation of Streets.

Lewisham.—A further variation from the plan sanctioned on March 7, 1899, for the formation or laying-out of a portion of Adamsrill-road, Perry Hill, Catford, so far as relates to a deviation in the position of that road (Mr. A. J. Dorrell).—Consent.

Means of Escape from the top of High Buildings.

Strand.—Means of escape in case of fire, proposed to be provided in pursuance of Section 63 of the Act, on the fifth, sixth, seventh, and eighth stories of an addition at the rear of the Grand Hotel, Northumberland-avenue, Charing-cross, next Northumberland-avenue (Mr. W. Woodward for the Gordon Hotels, Ltd.).—Consent.

City.—Means of escape in case of fire, proposed to be provided on the eighth, ninth, and tenth stories of a building known as Salisbury House, on the north side of London Wall, City, abutting upon Circus-place, Finsbury-circus and Weist-street (Davis & Emanuel for Mr. L. Newmann).—Consent.

*** *The recommendations marked* † *are contrary to the views of the local authorities.*

THE CHURCH CRAFTS LEAGUE.

THE first general meeting of the year was held on Monday evening last in the Hall of Clifford's Inn, when a crowded audience assembled to hear Mr. Roger Fry's lecture on "Art Patronage of the Church in Italy during the Fifteenth Century." The Bishop of Rochester was in the chair. Mr. Fry gave a description of the relationship which existed between the church in Italy and the great artists of the fifteenth century. He explained the characteristics of the various painters and sculptors of the time, and gave lantern illustrations of some of their typical works. At the conclusion of the lecture, Mr. Charles Holroyd (keeper of the Tate Gallery) said it was the custom in the fifteenth century for a wealthy family to make itself responsible for the decoration of a certain portion of a church, and to employ the best artist it could procure to carry out the work. He thought that some such plan might be adopted now with good results. Mr. Selwyn Image protested against the idea that one man must be responsible for all the decorative work of a church. If real artists were employed, they would all be actuated by the same spirit, and the result of work done in such a way would not be lacking in unity of purpose. Mr. Henry Holiday briefly mentioned the drawbacks under which modern artists had to learn the technique of their art. Instead of being taught in schools by the best men of their day, the young artists had to spend years of independent labour in mastering technical difficulties.

REBUILDING AT CHARING CROSS.—The block of old houses, distinguished by their bay windows, at Charing-cross, being Nos. 62-3-4-5, will shortly be pulled down to make way for new premises which are to be erected for the Canadian Pacific Railway Company. The four houses stand between the Sun Insurance Office and the Union Bank of London. No. 64 was the shop of the long-established firm of Holtzapffel & Co., machine-tool and instrument makers, who have taken new premises at Nos. 13-4, New Bond-street. Designs for the new buildings have been prepared by Mr. G. Richards Julian.

Correspondence.

THE AMENDMENT OF THE LAW OF ANCIENT LIGHTS.

SIR,—My attention has been drawn to the concluding words of your article on "Ancient Lights" in the *Builder* for the 15th inst. In these words you intimate your fear that the Report of the Joint Committee of the Royal Institute of British Architects and the Surveyors' Institution on the subject is likely to remain without practical result. At any rate, it has passed beyond the report stage, for it was referred back by the councils of the two bodies to the committee, with authority to spend the necessary money and take the necessary advice in order to draw a Bill embodying its provisions. This Bill has been drawn, and I understand that it is under the consideration of one of the Councils, having been already adopted by the other.

On a subject where great differences of opinion exist, it is not unlikely that considerable discussion may have arisen, though I heartily join in the regret you express that so much time has passed. I may point out that if our Bill, in the shape which the Joint Committee approved, becomes law, the view which Mr. Justice Wright's judgment would have established will be enacted by statute. Both Councils are, I think, committed in honour to attempt legislation.

T. ROGER SMITH,
Chairman of the Joint Committee.

COMPETITIONS.

SIR,—I have read with interest a letter from "Non-Competitor" in your number of the 15th inst., in which he instances the Hull competition drawings. I think it but justice to the Committee to state that they quite agreed with my suggestion that no perspectives were to be sent in ; and although some of the competitors, when questions were sent in, wished to be allowed to send perspectives, we replied, "Assessor strongly objects to perspectives in a competition." I think they (except, of course, before a building is erected) are quite unnecessary. I particularly mentioned in the Hull conditions (as I have done in previous conditions) that competitors need not make elaborate drawings, and suggested that they should save themselves as much work as possible.

One cannot but feel that with an assessor who understands what plans and elevations are, pencil sketches (and those one-sixteenth scale) should be ample for all competition purposes.

I think "Non-Competitor" has over-estimated the cost of the Hull drawings, considering there were no perspectives. I was very grieved to see so many drawings, and some of them so carefully done. Unfortunately, though the draughtsmanship was good, in many instances the plans, owing to "so much originality," were obliged to be set aside on the question of cost. I am afraid this is too much an age of utilitarianism for many who compete. I unhesitatingly say that 75 per cent. of the designs in this competition were quite impracticable either in plan or elevation—some in both.

It is very painful to an assessor to see so many designs, but it is not alone in architecture that competition is so keen, as every one must know. Architectural competition has undoubtedly brought many a young man to the front, and one feels that it is a necessary evil ; the only thing for the Institute to do is to ask committees to insist on competitors only making pencil sketches, and those to a small scale. If I am placed in the position of assessor again (in any case), I shall endeavour to carry this view out, but I must say at Hull (this being a small building) we felt it necessary to have ⅛-scale drawings ; though, as I have previously mentioned, we particularly made it clear that competitors were not to take more trouble than was absolutely necessary. In this particular case, I think and hope, the first-placed competition drawings will be of use, because they will no doubt be submitted to some boards for sanction, and it would be necessary, in any case, to make preliminary plans before working drawings were finally made.

The drawings were on view to the public with the reports in every case attached. No doubt in competitions where so many drawings are sent in there must be some heartburning

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(no doubt possible mistakes in assessing), but one can see no remedy except to endeavour not to multiply the work of competitors. It is a subject one might write on to indefinite lengths, but I have endeavoured to express my views as concisely as I can.

SIDNEY R. J. SMITH.

BUILDERS' ACCOUNTS.

SIR,—Having been engaged with "Builders' Accounts" for many years, I was interested by your review of a new book on the subject by Mr. John A. Walbank, and the author's letter in your issue of February 8. Mr. Walbank is to be congratulated on his concise and able treatment of the subject, but I venture to suggest that much of the detail might with advantage have been omitted, and that some attention ought to have been given to detail costs.

The most satisfactory system I have had experience of would not, I am afraid, commend itself to Mr. Walbank. In this system the costs are kept in an independent set of books, with the result that their accuracy is not checked save in a very approximate manner, but they are rendered non-essential, and either detail or general costs could be abandoned under pressure or by small builders.

With regard to "tender" book, the abstracting of labour and materials in tenders is an unprofitable labour, and it would be better to keep the record of tenders and comparison of results in separate books. The stores account need only be kept for home yard, and in the case of small builders is unnecessary, but the plant journal and ledger should never be dispensed with.

All builders who have neither the time nor knowledge of accounts to go thoroughly through their own books should certainly have them audited, but it is a regrettable fact that many otherwise practical builders neglect this department, and their offices are understaffed and underpaid, with the result that the books are too often hopelessly behind and slovenly kept.

THOS. E. BROWN.

NUMBER OF BRICKS LAID IN A DAY.

SIR,—I have made many inquiries on different jobs, and find that the number of bricks laid by each man in ordinary plain work varies from 400 to 600 per man per day. Most foremen agree that some years since each man laid 1,000 bricks.

HENRY LOVEGROVE.

The Student's Column.

PART II.—DRAINAGE.

CHAPTER 7.—HYDRAULICS (*continued*).

IT is not always possible to obtain the gradients recommended in the last chapter. The depth of the sewer and the level of the lowest floor of the premises to be drained may allow only a small fall to be given to the drains. In such cases, the main drain may be laid with a smaller inclination, and periodically flushed by means of an automatic tank at the head. All (or nearly all) the branches can, if this is done, be laid at proper slopes.

An objection often raised to quick gradients is that they necessitate deeper trenches, and that the drains are consequently more costly. This is not true in every case. In houses built on the slope of a hill it is often more economical to adopt quick gradients following in the main the natural slope of the ground, rather than a series of drains of low inclination stepped at manholes and lampholes. Fig. 3 will make this clear. The ground has a general slope of 1 in 20. The full line shows a 6-in. outfall drain laid to a slope of 1 in 24. The dotted lines show the arrangement required if a regular slope of 1 in 60 is maintained. In both cases the drain is at no place less than 2 ft. 6 in. below the surface. The drain with the smaller inclination obviously involves deeper trenches, and (unless the trenches run to a great depth) more manholes or lampholes, on account of the greater number of steps in the drain. The excavation required for the 1-in-24 drain is represented by the oblique shading; the dotted oblique lines in the same direction show the additional excavation required for the 1-in-60 drain if an additional manhole or lamphole is constructed at A. If this is not provided, still more digging will be required as shown by the reversed oblique dotted lines. In either case the flatter gradient involves a deeper manhole at B.

A word of warning must be uttered with regard to the different slopes allowed for pipes of different sizes. Many persons appear to think that if the levels of the drain-inlet and sewer will only admit of a slope of, say, 1 in 60 being given to the drains, 6-in. pipes ought to be used, whereas, if a gradient quicker than 1 in 40 can be obtained, a 4-in. drain may be used. The fact is that the larger drain ought to be used only in those cases where there is a correspondingly greater flow of sewage. In Table III. it was shown that a 4-in. pipe laid to a slope of 1 in 34 and flowing one-third full discharges sewage at the rate of 3·91 cubic ft. per minute, the velocity of the flow being 2¼ lineal ft. per second. To produce the same velocity in a 6-in. drain laid to a slope of 1 in 65, there must be a discharge at the rate of 8·84 cubic ft. per minute. If this larger quantity of sewage is not passed through the pipe, the depth of the flow will be reduced, and the velocity will fall below the assumed minimum of 2½ ft. per second.

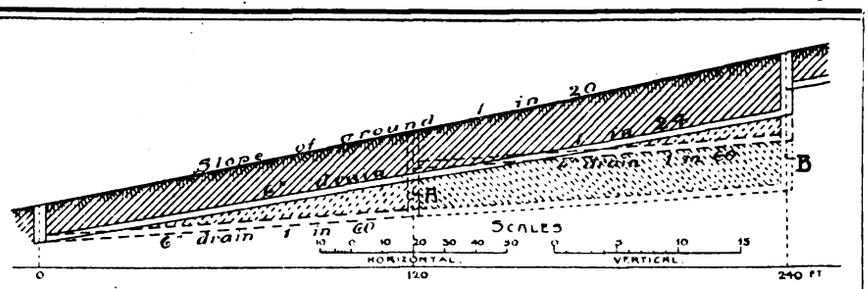

Fig 3.

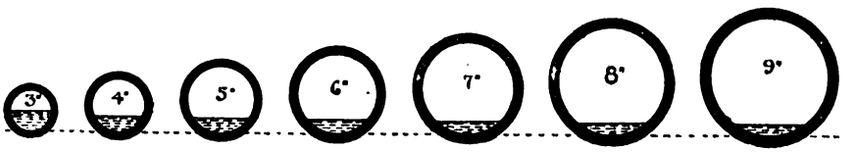

Fig. 4.

For purposes of comparison, reference may be made to fig. 4. A 3-in. pipe laid to a gradient of 1 in 40 and flowing half-full is taken as the standard. This is estimated to discharge 3·32 cubic feet per minute, the velocity of the flow being 2·25 lineal feet per second. In the larger pipes the depth of flow will be as shown, and as the hydraulic mean depth becomes less with each successive increase in the diameter of the pipe, the velocity is reduced, so that in the 9-in. pipe it is slightly less than 2 ft. per second, *although the gradient remains the same.*

If the 9-in. pipe had been laid to give a velocity of 2·25 ft. per second when flowing half-full—thus corresponding with the 3-in. pipe—the gradient would have been 1 in 237, and the velocity of the flow, when 3·32 cubic feet per minute were passing through the pipe, would have been barely 1 ft. per second.

Large pipes, therefore, are a positive disadvantage unless the quantity of sewage is proportionate to their capacity. If the sewage is only sufficient for a 4-in. pipe, and a 6-in pipe must (in consequence of local regulations) be used, the latter must be laid at a slightly steeper gradient than would have been necessary in the case of the smaller pipe.

The Size of Drains.—The model by-laws (both urban and rural) issued by the Local Government Board, and the new drainage by-laws of the London County Council, require every drain "to be of adequate size, and, if constructed or adapted to be used for conveying sewage, to have an internal diameter not less than *four inches.*" This by-law leaves the size of sub-soil drains and rainwater drains to the discretion of the sanitary authority's surveyor or the architect or builder, but prescribes a diameter of at least 4 in. for sewage drains. Many authorities specify that main drains must be 6 in. in diameter, and branch drains 4 in.; others require that branch drains from water-closets to be also 6 in. in diameter; others, again, allow no drain to be less than 6 in. Under certain authorities "combined drains" must be at least 9 in. in diameter, even if only two small houses are served by the drain. The Board of Education considers a 4-in. drain suitable for as many as ten water-closets; for a greater number a 6-in. drain must be used.

Here again, very little can be learnt from official regulations, and the question must be considered with regard to the amount of sewage to be carried away in a given time. This differs enormously, according to the nature and size of the building, the area to be drained, the partial or total admission of rain-water, and other circumstances. The sewage produced in the labourer's cottage is obviously very different in quantity per person from that produced in the squire's mansion. If the rain-water falling on a country house and its curtilage is admitted to the drains, the sewage proper will be a very small proportion of the total flow in a thunderstorm. Subsoil-water, if admitted to the drain, may largely increase the volume of sewage. It is, therefore, impossible to lay down a hard-and-fast rule, but a little consideration will show that small drains will carry away a far larger quantity of sewage than is generally supposed.

In the example given in Chapter 5, the total daily flow from a middle-class house occupied by eight persons was estimated to be 220 gallons. This is equivalent to rather over 35 cubic ft. On reference to Table III. it will be found that a 4-in. drain, laid to a slope of 1 in 34 and running full, will discharge this quantity in about two and a quarter minutes; if the drain is running one-third full, the time occupied by the discharge will be less than nine minutes. Obviously, a 4-in. main drain can convey a much larger quantity of liquid than is likely to be produced in a dozen houses of this class. The branch-drains have still less to do. In such a house there will probably be, at least, six branch drains—say two for sinks, two for baths and lavatories, and two for water-closets. These will receive different proportions of the sewage, probably one-half going to the drain from the family bath and lavatory; the other branches will therefore receive very small quantities. The branch from the servants' water-closet will probably not have a greater daily flow than ten or twelve gallons. Four-inch branch drains are therefore much too large, as far as their carrying capacity and the flow of sewage are concerned.

We will now suppose that the rainwater must also be carried away by the sewage-drains. Taking a severe thunderstorm, with a rainfall of 1 in. in a quarter of an hour, as the basis of calculation, we have a flow of water at the rate of ⅝ cubic feet per minute for every 100 square feet of roofed or paved surface to be drained. If this surface is 4,000 square ft., it will receive 22·2 cubic feet of rain per minute. Some portion of this will be lost by absorption and percolation, but the loss in a storm of this kind will be trifling, and need not be taken into consideration. Referring again to Table III., we find that a 5-in. drain, laid to the minimum gradient of 1 in 48, is capable of discharging 25·72 cubic feet per minute when running full; add 10 per cent. in order to obtain the maximum discharge (which occurs when the pipe is not quite full), and we get a maximum discharging capacity of 28·29 cubic feet per minute, that is to say, 6 cubic feet more than the rainfall. A main drain 5 in. in diameter is, therefore, capable of discharging 6 cubic feet (37½ gallons) of sewage per minute in addition to the rain-water.

The branch drains conveying rain-water to the main drain will probably be at least eight in number, some of which may also convey sewage. The areas served by the different branches will not be equal, but probably no branch will have to carry away more than one-fifth of the rainfall, or about 4·4 cubic feet per minute. A 3-in. drain laid to a gradient of 1 in 21 will discharge more than 9 cubic feet a

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minute when running full ; a 4-in. drain with a gradient of 1 in 34 will discharge more than 16 cubic feet. This quantity of 4·4 cubic feet per minute is not likely to be often reached in practice, as it represents the rainfall on an area of no less than 800 square feet, but even if we have, say, a courtyard 50 ft. square with a single gully in the centre, the maximum rainfall per minute will be less than 14 cubic feet, and a 4-in. drain with a gradient of 1 in 34 will, therefore, be ample.

As far as the combined volume of sewage and rain water is concerned, there is no necessity (save under the most exceptional circumstances) for branch drains of proper gradients to be more than 4 in. in diameter, and in the vast majority of cases 3-in. drains would never be charged to more than half their capacity.

The question which now remains to be answered is this : Is there anything in ordinary sewage which is likely to cause obstructions in small drains? This is a question which can best be answered by practical experience, or (failing this) by experiment. Unfortunately, the by-laws of Sanitary Authorities have in a large measure prevented the use of small drains, and there is probably not a Sanitary Authority in the country which would at this moment allow a sewage drain to be constructed of a less diameter than 4 in. Experience has shown, however, that the successive changes from large brick barrel drains to 9-in. pipes, and from these to 6-in., and from these again to 4-in., have been entirely successful ; and there can be little doubt that the diminution will be carried still further. The reduction of soil-pipes to 3½ in. will probably be followed by a corresponding reduction in the size of branch drain-pipes, and both may eventually be still further contracted.

Many experiments have shown that 4-in. drain-pipes are better than 6-in. for branches. In 1896 Mr. Arthur B. Plummer, F.R.I.B.A., of Newcastle-upon-Tyne, carried out several series of experiments with 6-in., 4-in., and 3-in. pipes, and in every case the 6-in. pipes gave the worst results. In the first series two drains were laid, each about 83 ft. long. One length was formed of 6-in. drain-pipes with a fall of 1 in 40, and the other of 4-in. pipes with a fall of 1 in 60. In each case there was a bend about 12 ft. from the outlet end, and a Buchan trap in the course of the drain. A wash-down water-closet, with a 2-gallon siphon cistern and 1½-in. flush-pipe, was used in the experiments. Artificial fæces composed of soft soap and sawdust were placed in the basin and flushed out in the usual way. The 6-in. drain was first tested. The first flush cleared the basin, but it was not till the sixth flush that half the charge came out at the mouth of the drain, and not till the eighth that the drain was cleared. Summing up this preliminary series of experiments, Mr. Plummer says that "although the 4-in. drain was not of so steep a gradient as the 6-in. drain, and although it also had a much more acute bend in it, the result of these experiments was decidedly in favour of the smaller drain-pipe."

Another series included experiments on 6-in. and 4-in. sanitary-pipe drains and 4-in. and 3-in. glass-lined iron pipes. These were laid alongside each other with a fall of about 1 in 40. The total length in each case was 82 ft., and each drain had an almost right-angled rounded bend 12 ft. from the outlet, and a trap 4 ft. in front of the bend. At a further distance of 8 ft. there was a junction from a water-closet, and at the head of each drain two water-closets were fixed over each other, as on the ground and first floors of a building. Four pieces of paper and a solid mixture of soft soap and sawdust weighing 6 oz. were used at each test, and each drain was tested by successive discharges from the first floor and ground floor closets at the head of the drain and from the closet along the course of the drain. The 6-in. drain was first tested. The three closets were charged and flushed in rotation twenty times, so that sixty deposits in all were passed into the drain. After the fourteenth round the drain was completely blocked ; of 22½ lbs. of soap and sawdust put in, only 7 had passed out. The 4-in. sanitary-pipe drain gave better results, the charge passing through more freely, till a stoppage occurred at the end of the sixth round. The results with the 4-in. iron pipes are described as "satisfactory," and with the 3-in. iron pipes as "even more so—each charge practically came direct through the drain with each flush." A flush of 2 gallons was used in this series of experiments ; with a flush of 2½ gallons the 9-in. pipe worked satisfactorily, and it was therefore not considered necessary to test the smaller pipes.

These experiments seem to show that 3-in. pipes may be safely used, even for drains from water-closets, and that they are indeed less likely to be choked than pipes of larger diameter. Some tests carried out by Dr. Charles Porter, of Stockport, on 6-in. and 4-in. drains corroborate the view that small pipes are better than large ones for house drains. Two drains, 47 ft. long, were laid, one with 4-in. pipes to a gradient of 1 in 40, and the other with 6-in. pipes to a gradient of 1 in 60. Each drain had one rounded bend of 90 deg. and a disconnecting trap of the same bore as the pipe. A wash-down water-closet gave better results than a wash-out basin. With the latter (tested in connexion with a 4-in. drain) the closet-trap was cleared in every case by a 3-gallon flush, but the 4-in. disconnecting trap was cleared only twice. Twelve tests with 2½-gallon and 2-gallon flushes gave still worse results ; in eight cases the closet-trap was not cleared, in five the drain was not cleared, and in every case the disconnecting trap retained a portion of the soil. The wash-down closet worked better ; the closet-trap and 4-in. drain were always cleared by a 2-gallon flush, but in no case was this sufficient to clear the 4-in. disconnecting trap. A 2½-gallon flush was not much better ; but 3 gallons invariably cleared the closet, drain, and trap. With a 6-in. drain (gradient 1 in 60) and a 6-in. disconnecting trap, even a 6-gallon flush cleared the trap only twice in four tests, and smaller flushes proved quite inadequate.

The moral is obvious—never use pipes of greater diameter than 4 in. for branch drains. Smaller pipes cannot yet be used (except in rural districts) on account of the local by-laws, but the time is probably not far distant when 3½-in. iron pipes will be allowed in place of 4-in. stoneware, and still further reductions will probably follow.

Large pipes are not only more likely to retain deposits, but they are also more difficult to ventilate and more costly. This question of cost is worth consideration, especially in country houses where the drains are of great length. The following list prices of stoneware pipes may prove useful in this connexion :—3-in., 6½d. ; 4-in., 9d. ; 5-in., 10½d. ; 6-in., 1s. 1½d. ; 7-in., 1s. 3d. ; 8-in., 1s. 6d. ; 9-in., 1s. 9d. To the difference in prime cost must be added the extra freight of the larger pipes, the extra labour and cement in laying, and the extra cost of the necessary bends, junctions, and traps.

OBITUARY.

MR. STEVENS.—We have to announce the death, in his seventy-sixth year, of Mr. James Stevens, of No. 88, Mosley-street, Manchester, and Chester-road, Macclesfield. Mr. Stevens was elected a Fellow of the Royal Institute of British Architects in 1877, and had been President of the Manchester Society of Architects. He enjoyed a considerable practice as an architect, surveyor, and valuer in Manchester, Macclesfield, and the localities around, and was employed as architect for the building of many large premises for business purposes. In 1882 he was instructed to prepare plans and designs for a complete restoration, with enlargement of the chancel and the north aisle, and new choir and clergy vestries, for the parish church of St. Michael, Macclesfield, as illustrated in our columns of November 27, 1886—three views and a plan. The work was finished, as far as the funds permitted, and the capacity was increased to 900 sittings, in 1892. Mr. Stevens was also appointed as architect, at Macclesfield, for the erection for the Town Council of the Technical Schools on the site of the Useful Knowledge Society's premises at Park Green in February, 1898 ; the enlargement, with a new front and new Council Chamber (1869-70), of the Town Hall (originally built in 1823-4 after Francis Goodwin's designs) ; the Militia barracks in the Crompton-road (1858-9), for which he made the plans and designs after the Gothic style, in conjunction with Mr. Pownall, of London ; the Chadwick Free Library, Park Green (1868-80), a gift to the Corporation by Mr. David Chadwick, M.P., in 1876 ; the School of Art, Park Green, of stone, in the Gothic style, opened in June, 1879 ; and the Infirmary near the Park (1870-2), for sixty in-patients, with quarters for the nurses' training-school.

HOTEL IMPROVEMENT, SHEFFIELD.—Improvements at the Royal Victoria Station Hotel, Sheffield, have just been completed. The architect for the new portion of the building was Mr. William Owen, of Manchester. The decorations have been carried out by Messrs. Goodall, Lamb, & Heighway, Manchester

GENERAL BUILDING NEWS.

THE RESTORATION OF IONA CATHEDRAL.—The Cathedral Church of Iona, which has for many years been in a dilapidated condition, is about to be restored. Founded by Reginald, Lord of the Isles, about the close of the twelfth century, the cathedral was at first used as a monastery, which was attached to a Norwegian diocese. Some of the evidences of its occupation by monks still exist in the remains of the chapter-house, cells, and dining-halls. Although it was first constructed in the twelfth century, most of the architecture is of a later period, probably of the fifteenth century. The cathedral, which is cruciform in shape, consists of a nave and choir, with aisles and north and south transepts, while a tower rises over the choir. The greater part of the building is roofless, including the choir, the aisles, and the south transept, and the present operations are to be confined to remedying that defect and thus making the edifice watertight. The question of roofing the tower and executing other details is at present under consideration. The height and form of the church roof are fixed by the existing east gable, which is entire, and also by the outline of the gable, which is seen against the central tower. It has been decided that the roof will be in strict conformity with the existing marks, and will be of the same dimensions as the original roof. The edifice will give accommodation for over a thousand persons, but it is not intended at present to erect seats. The architects are Messrs. M'Gibbon & Ross, Edinburgh, and the contractors Messrs. Mitchell & Sons, Edinburgh.—*Scotsman*.

CENTRAL HALL, PRIMITIVE METHODIST CHURCH, SOUTHSEA.—Building extensions have been made in Albert-road, Southsea, for the Primitive Methodists. The front elevation consists of a spire some 70 ft. high on one side, and a turret on the other side. There is a window in the front, 12 ft. wide and 16 ft. in height, with ornamental Bath stone work and cathedral glass set in lead. There are two entrances, one on each side. The one on the right-hand side is the main entrance to the hall, 6 ft. wide. The left-hand entrance is to the school. Two shops are provided between the two entrances. The hall is 36 ft. wide and 76 ft. long. The seats are all semi-circular and rise one above another. The orchestra on each side of the organ occupies an elevated position facing the congregation. The organ has been built and supplied by Messrs. Wadsworth Bros., of Manchester. The pulpit, seats, &c., are of pine. The hall will accommodate about 600 persons. The schoolroom will hold some 400 children. There are three classrooms, a kitchen, and a minister's vestry. The buildings are warmed with hot water, and the lighting will be by electric light. The architect is Mr. T. Wonnacott, and the contractors were Messrs. T. Quick & Son.

UNITARIAN CHURCH, ABERDEEN.—A new Unitarian church is to be erected at Aberdeen in Skene-street, at its junction with Rosemount-viaduct. The architects are Messrs. D. & R. J. M'Millan, Aberdeen. The cost will be about 5,000*l*.

FIFE AND KINROSS ASYLUM.—A meeting of the Lunacy Board of Fife and Kinross was held in Cupar on the 11th inst. The committee had before them plans prepared by Mr. Gillespie, architect, for the proposed extensions at the asylum. The Chairman explained that the general idea was to provide another 100 beds. The expense of the additions and alterations was roughly estimated at from 10,000*l*. to 11,000*l*. The committee required the authority of the Board to allow the architect to make detailed plans and specifications and estimates of the cost, which would be submitted to the Board. After some discussion, it was agreed that scheme C should be adopted, and it was remitted to the committee to get Mr. Gillespie to prepare plans and specifications, with estimates, and submit these to the General Board of Lunacy and also to the Board for approval.

ENLARGED PREMISES FOR THE SHEFFIELD CLUB.—At the annual meeting on the 11th inst. of the members of the Sheffield Club it was resolved to enlarge the premises, and bring the building more in harmony with modern ideas. The intention is to build a wing on the new site, and to remodel the whole of the present premises. The plans provide for a coffee-room, new billiard-room, members' bedrooms, elevator, and other accommodation. A competition for the new buildings and alterations recently took place among Sheffield architects, with the result that Mr. J. W. Connon, of Leeds, who was appointed assessor, awarded first place to Mr. J. I. Potter, of Norfolk-street.

LIBRARY, WOLVERHAMPTON.—Wolverhampton's newest municipal building, the Jubilee Free Library, situate at the corner of Cleveland-road and Garrick-street, the opening of which we briefly mentioned last week, has been designed by Mr. H. T. Hare, of London, and erected by Messrs. Wilcock, of Wolverhampton. The site of the structure was formerly occupied by the Theatre Royal, which after the erection of the Grand Theatre in Lichfield-street, was for many years vacant. The walls are of red brick with terra-cotta mouldings and dressings, and the roof is covered with red tiles, but a considerable amount of ornamental work has been introduced in connexion with the main entrance, which has a triple arch and two doorways leading into a vestibule. On the left-hand side of the entrance hall is the magazine-room: 68 ft. long by 30 ft.

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broad, the coved ceiling being supported by pillars with Corinthian capitals. Over a concrete floor has been placed a thick cork covering which will prevent any noise through people moving from one part of the room to another. Light is admitted through six arched windows on either side of the room, with two at the Hall-street end. The news-room is situated on the same floor, and is 50 ft. long by 45 ft. wide. The upper rooms are reached from the vestibule by means of a winding staircase, with polished Hopton Wood stone sides, and balustrade of the same material, which opens into another vestibule with ornamental lights from the ceiling. On the left-hand side is situated the lending library, which is of the same dimensions as the magazine-room. Light is here secured by means of double-arched skylights placed in the centre of the ceiling. Adjoining the lending library is the reference library. There the walls are panelled with oak, and the fittings are of the same material, while provision is made for the care of about 9,000 volumes, though in a room above will be placed the newspaper files and other books which are not so frequently asked for as those in the reference library proper. Special accommodation has been made for the chief librarian.

COLNE AND HOLME VALLEYS ISOLATION HOSPITAL.—On the 13th inst., in one of the rooms at the Huddersfield Union Offices, Mr. F. St. George Mivart, M.D., an Inspector appointed by the Local Government Board, held an inquiry into an application made to that Board for sanction to the borrowing by the West Riding County Council of 23,744*l.*, for the erection by the Colne and Holme Valleys Joint Isolation Hospital Committee of an infectious diseases hospital at Meltham Moor. Mr. J. Berry, the architect, gave a description of the site and the proposed hospital, with the estimates of the cost. The site of the hospital is about one mile from Meltham Station, called Meltham Moor, and adjoins the public highway from Meltham to Slaithwaite and Marsden. The total area of the land acquired is 19a. 3r., and the area of the site intended to be used for hospital purposes is 7 acres. The height of the hospital above the sea level will be 700 ft. The hospital will consist of seven blocks of buildings: — 1, administration; 2, lodge and discharging-rooms; 3, isolation block for six beds; 4, scarlet fever pavilion with two separation wards for sixteen beds; 5, another scarlet fever pavilion, without separation wards, for fourteen beds; 6, typhoid fever pavilion for fourteen beds; 7, laundry, disinfecting-rooms, stable, engine and boiler-house, and mortuary. There will be a porter's lodge near the entrance gates. The isolation block will contain two bed wards, two single bed wards, and two nurses' duty rooms. There will be an open verandah in front of each section, and leading off it will be the water-closets and slop sinks, and a movable bath will be placed under each verandah. The total space of the wards will be 2,028 cubic feet, and will give 150 sq. ft. per bed. Each of the scarlet fever pavilions will have two wards, each with eight beds for females, two other wards each with six beds for males, and there will be two separation wards in one pavilion only. The nurses' duty rooms or ward kitchen will be placed in the centre of the building, and will have four fixed windows allowing complete observation of the four wards. The convalescent-room will be on the first floor in the centre of the pavilion, over the entrance passage and nurses' duty room, and will be approached by a stone staircase from the front entrance. The bath-rooms, water-closets, and slop sinks will be placed at each end of the wards, cut off by a cross ventilating lobby. An open verandah will run along the south-east front of each pavilion. The wards in the scarlet fever pavilion will be of the same total area as those of the isolation block. The typhoid fever pavilion will have six beds in the female ward, six in the male ward, and one bed each in the two separation wards, and the nurses' duty room will be similar to those in the scarlet fever pavilions. There will be no convalescent room to this pavilion. One movable bath will be provided, and the water-closets and slop sinks will be placed at each end of the wards. The total area of the pavilion will be the same as in the other pavilions. The laundry block contains wash-house, laundry, drying stove, receiving-room, disinfecting-rooms, van shed, ambulance, stable, harness-room, covered yard, coal place, engine and boiler house, accumulator-room, long chimney, mortuary, and viewing-room. All the larger wards will be heated by means of open double-fronted stoves placed in the centre of the rooms, and the smaller wards will have open fireplaces. The bathrooms will be heated by small radiators. Fresh air inlets will be provided behind each bed; all the windows will be double hung with sliding sashes, and fanlight made to fall inwards above. Ventilating shafts will be fixed in the ceilings of each ward, and connected to extract ventilators on the roof. All the wards will have 1 square foot of window to every 66 cubic feet of space. All the baths in the pavilions will be supplied with hot water obtained from steam-heated calorifiers.

ADDITIONS TO HOSPITAL, BUCKNALL, STAFFORDSHIRE.—Additions to the infectious diseases hospital of the Hanley, Stoke, and Fenton Joint Hospital Board were opened at Bucknall on the 6th inst. These are the third extensions which have taken place during the last six years, and they include a new eighteen-bed pavilion, with separate wards and annexes; a large addition to the administrative block; a power block, containing steam boiler, engine, dynamo, accumulators, &c., and chimney shaft 60 ft. high; additions and extensive alterations to the laundry block, with modern disinfecting station; new stabling and ambulance house block. The total cost has been about 10,500*l.* The whole of the work has been carried out by the various contractors to the designs of and under the superintendence of Mr. Elijah Jones, architect, Hanley. The eighteen-bed pavilion is planned as per the Local Government Board's requirements for eighteen beds, with 2,028 cubic ft. of air space to each, but like all other buildings on the site, it is furnished for double the number allowed, viz., thirty-six—half the number being children's cots. It has a central entrance leading into a hall, which is heated by a radiator connected with the bath boiler at the back of the range in the nurses' duty-room. Larder and coal place are provided on either side of entrance. In front, on entering, is the nurses' duty-room. Four inspection windows are provided, looking into both wards, and also into separation wards. To the right and left are the principal wards, each being 48 ft. by 26 ft. Entering out of these are the separation wards. At the end of each ward is the annexe, approached by a disconnecting and ventilating lobby (which cuts off this part of the building from the main wards). It contains two water-closets, nurses' slop-sink, bath-room with lavatories, and a small storeroom. The whole of the floors to wards, separation wards, nurses' duty-room and bathrooms, are laid with maple floorboards, polished. The floors of the vestibule, corridors, and annexes, except the bath-rooms, are laid with terrazzo, and the walls are covered with tiles. The painted woodwork to interior and ceiling is finished in "Ripolin." The large wards are heated with Shorland's patent down-draught hot-air faïence stoves (two to each ward), and the separation wards are heated with their patent Manchester grates. Behind each bed is fixed in the wall, near the floor, a patent inlet to admit the air, with as little draught as possible. Air inlets are also fixed in the walls between windows, with Boyle's brackets; also outlets above these in the wall at the ceiling level. In addition to these outlets, grids are fixed in the ceiling connected with air-tight wood channels or troughs, which are in turn connected with Boyle's air-pump ventilators on the roof. The ward windows also assist the ventilation. The laundry block has been almost remodelled, as well as enlarged; it is now a dual system, containing patients' wash-house, staff wash-house, ironing-room, hot-air drying closets, disinfection station, and mortuary. The machinery has been supplied by Messrs. Summerscale & Sons, Keighley. Electric light is provided in the building. The stabling block is built round the coach-house erected for ambulance, and contains now spaces for two ambulances, two-stall stable, loose box, harness-room, loft, and a room which could be used as a bedroom. A large addition has been made to the administrative block. The chief features are the entrance-hall and new main staircase, servants' hall, housemaids' pantry, larder, ten bedrooms, nurses' bathroom, sitting-room, lavatory, water-closet, and linen stores. The finishing of the premises is somewhat similar in character to the eighteen-bed pavilion, the walls having tiled dado, with plaster above instead of all tiling. In connexion with these extensions, Messrs. H. P. Embrey & Co. have been the contractors for the buildings, and included in their contract are the Marsden Tile Co., Burslem, who have executed the whole of the tiling to walls, dadoes, hearths, &c.; Messrs. Diespeker, London, the terrazzo paving; Messrs. George Howson & Sons, Hanley, the whole of the baths, water-closets, slopsinks, lavatories, and sanitary fittings; Messrs. Shorlands, Manchester, the faience stoves and Manchester grates; Messrs. Boyle & Sons, London, the roof ventilators and inlets, except those behind the beds, which are Messrs. Ellison's; Messrs Lockerbie & Wilkinson, Birmingham, the locks, door fasteners, and ventilating hoppers. Other separate contracts are by:—Mr. E Malkin, Hanley, for the furniture; Messrs. Holgate & Small, Stoke, for the bedsteads and ironmongery; Messrs. Summerscale & Sons, Keighley, for the laundry machinery; Messrs. Manlove & Alliot, Nottingham, the disinfector; Messrs. Blackburn, Starling, & Co., Nottingham and Hanley, the engine, dynamo, accumulators (Chloride Co.), and the electrical plant; grates, chimney-pieces, and ripolin, Mr. J. Collings, Hanley; wrought-iron dog grate, by Mr. W. Durose, of Tunstall.

MANCHESTER CUSTOMS OFFICES.—For a considerable time past the Customs authorities at Manchester have pressed upon the Commissioner of His Majesty's Board of Works the necessity of having a new custom house in Manchester to meet the increasing volumes of trade in that city and its vicinity. The matter has now taken tangible shape. Mr. Tanner, on behalf of the Commissioner of Works and Public Buildings, has intimated that the Department is prepared to receive tenders for the erection of the new custom house at Manchester. Messrs. J. L. Lee & Son, architects, of Craven-street, Charing Cross, London, have prepared bills of quantities, and forms of tender may be obtained from them. Tenders may be delivered up to March 3.—*Manchester Courier.*

CORN, &C., EXCHANGE, MANCHESTER.—The new Corn, Grocery, and Produce Exchange, which is being built upon the area bounded by Hanging-ditch, Cathedral-street, and Fennel-street, is approaching completion. The general plan of the exterior of the new exchange is a building of four to six stories, with an average depth of 40 ft. back from the street, the exchange itself occupying the inner triangle thus formed. The site presented considerable difficulties, for it was necessary to preserve the light to the lower stories of the street buildings at the back, and at the same time to secure a simple and symmetrical roof over the exchange. It was found that these two demands could only be satisfied by adopting a form of roof which had its main lines parallel with the three streets. Any regular geometrical form was out of the question. The result is an irregular triangle supporting a circular dome. The main roof is carried on an arcade, parallel with the walls at a distance of about 18 ft., and this space is covered by a coved roof, brought down so far and in such a way that the first floor offices have ample direct light. The arcade supporting the roof is of columns 24 ft. high and arches rising to a height of 36 ft. At a height of 44 ft. is a cornice or balcony, projecting 4 ft., with massive consoles underneath From this point springs a cove, the three sides meeting in a triangle (66 ft. from the floor), and upon this rests the central dome, which is 30 ft. in diameter. The constructional parts are of steel. The building surrounding the central hall is of various heights, from four stories and a basement in Fennel-street to six stories, basement, and sub-basement (or eight in all) in Cathedral-street. The whole of the frontage is faced with dressed Yorkshire stone. The basements and sub-basements of the building will be almost entirely taken up with the produce trades, and some of the ground-floor premises are also being let as warehouses for these trades. When completed, the whole building will contain 350 warehouses, shops, and offices, besides an hotel of forty rooms. The character of the general scheme has been maintained inside the building as well as outside. The corridors and staircases are airy and well finished in tiles and mosaic, and all the floors are fireproof. For artificial lighting electricity has been employed, and a system of heating by means of steam has been provided. The architects for the new buildings are Messrs. Potts, Son, & Hennings, and the general contractors are Messrs. Robert Neill & Sons.—*Manchester Guardian.*

THE NAZARETH HOME, LANCASTER.—A new home in Ashton-road, Lancaster, has been erected by the Order of the Sisters of Nazareth, whose headquarters are at Hammersmith, London. Provision is made for 250 children, but as far as the accommodation will allow the beneficence of the Order will be extended to a few old men and aged women. It is a home for destitute children, strictly speaking for girls, as boys are provided for by the Order at Ditton Hall, in the South. The new buildings are approached by a drive through an entrance gateway situated in Ashton-road. The main front, which faces south-east, has a projecting gable flanked by angle buttresses and having a niche over the doorway containing the figure of St. Joseph; above the niche is an oriel window. At each end of the main front are projecting wide gables, with two stone dormers between on each side of the entrance gable. At the north-east end is a projecting octagonal-ended apse to the chapel, and at the south-west end is a secondary staircase gabled against the main block. Entering through the vestibule, 10 ft. wide, a corridor, 8 ft. wide, is reached, which runs longitudinally through the building. On one side are the chapel and sacristy, sitting-room, schoolroom, and workroom; on the other a large dayroom, sisters' dining-room and pantry, main staircase, and men's sitting-room and dormitory. Corridors also branch off to the kitchen wing and also to the offices and bathroom blocks and garden entrances. The kitchen and scullery are 28 ft. and 21 ft. 6 in. long by 19 ft. wide respectively, and each have access to a corridor from out of which open stores. The first floor is divided by similar corridors to the ground floor, with women's and sisters' dormitory, women's refectory, linen room, guest room, sisters' day room, &c. On the second floor the same scheme of main corridors is repeated, with the various dormitories. babies' day room, children's clothes store, bathroom, &c., opening out of the same, and the offices are in cut-off blocks, one to each side. The basement contains play room, lavatory, and changing-rooms, and various cellars, and heating-chamber. The kitchen wing is all one story. The buildings are of stone lined with brick, and the roofs are covered with green slates. The corridors have tiled floors of fireproof construction. The staircases of stone are also fireproof, and with glazed brick dados running round both staircases and corridors. The laundry and washhouse block, which is a detached block, standing some distance to the north-east of the main building, is a one-story building, with a receiving-room, washhouse, and laundry, together with stable, loft, and piggery. The buildings are in the Tudor style, with mullioned and transomed windows. The work has been carried out by the following contractors:—Masonry

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B. Graham & Sons, Huddersfield; the carpenters' work was mainly executed by Mr. T. Hird, of Keighley, who was the original contractor, and the joinery has been done by Messrs. J. Hatch & Sons, of Lancaster; slaters' work by Messrs. Hill & Nelson, of Morecambe; plasterers' work by Mr. O. Lister, Ilkey; plumbers' work and electric lighting by Messrs. Calvert & Heald, of Lancaster; heating by Messrs. Dilworth & Carr, of Preston; cooking appliances by Messrs. Newton, Chambers, & Co., of Manchester; and laundry fittings by Messrs. Bradford & Co., Salford. The buildings have been erected from designs by and under the superintendence of Messrs. Austin & Paley, of Lancaster. The outlay on the new home has been 15,000*l.*

TOWN HALL, THETFORD.—On the 6th inst. Thetford new Town Hall was thrown open to the inspection of the burgesses and their wives. The new building will cost about 10,000*l.* It consists of basement, fire-engine house, coal store, kitchen, scullery, Mayor's parlour, large hall, council chamber, magistrates' room, county court, entrance hall, and grand jury chamber. A feature is the stone porch, with the flight of York stone steps. The stonework throughout is of Ketton stone, and the outside brickwork has been done in white Cossey bricks. The entrance hall is 10 ft. wide, with a height of 14 ft. The outer doors are panelled oak, and there are double doors opening out of it to the large hall, and the County Court. The large hall is 52 ft. long by 27 ft. wide, with a height of 23 ft. 9 in. to the crown of the ceiling. The floor is carried by steel girders and wood joists, and consists of a 1-in. oak floor laid on a ⅞-in. deal floor. At one end there is a gallery 27 ft. long by 8 ft. wide, with ornamental curved iron front, and at the other the statue of Justice (date 1799) is placed in a decorated niche. The walls are finished in plaster with Duresco colouring. The ceiling, which forms an elliptical arch, is spaced out in panels. There are three central electric light pendants, as well as wall brackets, which latter are only intended for occasional use; arrangements have been made to admit of movable electric lights upon the platform when the room is used for public meetings. This room will be warmed by four hot-water radiators. The county court is 30 ft. long by 27 ft. wide, with a height of 14 ft. 7. in. The floor is of wood blocks laid on concrete, and the room is heated with hot water pipes laid in trenches. The council chamber is 27 ft. long by 19 ft. 6 in. wide, with a height of 14 ft. 2 in., with circular-headed windows on two sides. The magistrates' room is 14 ft. by 12 ft. This will be used by the magistrates as a retiring-room, and will also form a private room for the recorder and county court judge when their courts are in session. At this end of the building there is also a cloak room and lavatory fitted with hot and cold water. The building, which is Queen Anne in style, is lit throughout with the electric light, and is heated with hot water. Mr. H. J. Green, of Norwich has been the architect for the whole of the work, and Mr. C. W. Bullen has acted as clerk of the works. Messrs. E Willmott & Sons, of Cambridge, have been the principal contractors for the building, and the sub-contractors were:—Stonework, Messrs. R. Hall & Son, Thetford; plastering, Mr. W. G. Crotch, Norwich; ironwork and water fittings, Messrs. Barnes & Pye, Norwich; clock, Mr. W. H. Harris, Thetford; County Court fittings, Messrs. Trevor, Page, & Co., Norwich; mosaic work, Mr. J. F. Ebner, London; electric lighting, Messrs. D. Brown & Co., Newcastle-on-Tyne; ventilating pipes and details, Exors. of late W. Clarke, Thetford.

INFIRMARY, ROCHDALE.—A few days ago a new workhouse infirmary, which has just been completed at a cost of 26,000*l.*, was opened at Rochdale. It stands on the high ground behind the Union Workhouse at Dearnley, about two miles and a half from Rochdale. It consists of a centre block, with accommodation for doctor and matron, administrative block behind the same, having receiving-rooms, dispensary, and operating-room. Over the same, accommodation for nurses and staff, and behind this kitchen offices. On either side is a pavilion, two stories high, exactly similar, one for males and one for females. On each floor is the general ward for twenty-eight patients, dayroom, small wards for one, two, four, and eight patients, nurses' duty-room, &c. The total number of beds for patients is 172. The architect is Mr. Butterworth.

BAPTIST SCHOOL, WYCOMBE.—On the 6th inst. a new Baptist school was opened at Wycombe, Bucks. The school is an instalment of a larger undertaking, viz., the erection of a chapel, which it is proposed to carry out in the future, in accordance with designs prepared by Mr. T. Thurlow, architect, of High Wycombe, from whose plans the schoolroom has been built. The school occupies a site at the junction of Oakridge and Jubilee roads, with direct and near access from the main road to Oxford. Accommodation has been provided for 250 persons, while there are also classrooms. The work of construction has been carried out by Mr. J. T. Harris.

NEW MUNICIPAL BUILDINGS AT LLANDUDNO.—At Llandudno on the 10th inst. the new municipal buildings were opened. The site was given by Lord Mostyn in commemoration of the completion of the sixtieth year of the reign of Queen Victoria. The buildings were designed by Messrs. Silcock & Reay, of Bath, and the cost of construction will amount to about 23,000*l.*

HOTEL, BROOMHILL, NORTHUMBERLAND. — The Grey Arms Hotel was opened recently at Broomhill. This is the first of the houses built under Earl Grey's Public-house Trust movement, the leading features of which are that the manager has no interest in the sale of liquor, but has an inducement to sell food and liquid refreshments of a non-intoxicating nature, and that all the surplus profits are to be spent by the Trust for the benefit of the district in which the house is located. The hotel is built of red brick, with Birling stone dressings and green Westmorland slates. There are on the road front two doorways, one leading into the hotel generally and the other into the bar. Entering at the former an entrance hall gives access on the left to the dining-room and on the right to the bar parlour and billiard-room. The bar parlour is furnished with fixed upholstered seating in three bays formed by the pillars supporting the main wall of the front, and is floored with mosaic. The kitchen department lying behind the dining-room is on an ample scale. The bar is a well-lighted apartment, lined with enamelled tiles and fitted with counter, showcases, seats and panelling, in green stained woodwork. Upstairs, over the dining-room, is a tearoom, served by a lift from the kitchen. The two rooms adjoining this are so arranged that they may be converted into one on any occasion demanding a large room. A suite of bedrooms for the visitors and bedrooms for the staff—with bath and storerooms—complete the upstairs accommodation. A large cellar occupies the whole of the basement below the bar parlour and bar. Behind the hotel is the stable block in process of erection. The chief contract has been carried out by Messrs. R. & G. Brown, of Amble, and sub-contracts for specialists' work by the following:—Hot-water heating, Messrs. Emley & Sons, of Newcastle; wall tiling by Messrs. Henry Walker & Sons, of Newcastle; mosaic flooring, by Messrs. Diespeker & Co., of London; lifts, by Messrs Waygood & Co., of London; counters and bar fittings, &c., by Messrs. T. Robertson & Sons, of Alnwick; acetylene gas installation, by the British Illuminating Co., of Newcastle. The heraldic painting on the swinging sign is by Messrs. Atkinson & Philipson, of Newcastle. The hotel was designed by Mr. Geo. Reavell, jun., of Alnwick, and the work has been carried out under his superintendence.

COUNTY SCHOOL, DENBIGH.—On the 13th inst. the foundation stones were laid for a new county intermediate school for boys at Denbigh, on Rhoffty Crown, near to the girls' and infants' board schools. The classroom accommodation provided is for eighty boys. There is also a workshop for eighteen boys, and a chemical laboratory for twenty students, and a science lecture classroom to accommodate forty. The building will be of limestone from the Graig Quarry close at hand. The work is being carried out from the designs and under the superintendence of Mr. James Hughes, architect, Denbigh. The contract has been let to Mr. G. H. Marshall, of West Smethwick.

BUSINESS PREMISES, SHEFFIELD.—Shops and offices are about to be erected at the corner of Angel-street and King-street, Sheffield, for the Corporation. The buildings will consist of four shops, with basements suitable for showrooms or workshops, and with a yard at the back. There are four upper floors of offices. The building is to be of Huddersfield stone and French Renaissance in style. The office corridors and staircase are to have mosaic floors and tile walls, and the building throughout is to have fireproof floors, covered with wood blocks. The architects are Messrs. Gibbs & Flockton.

WHOLESALE MARKET, LEICESTER.—On the 13th inst. Councillor Hilton opened the new wholesale market in Halford-street, which has been erected at a cost of 60,000*l.* The market contains at the Halford-street end a building having an office set apart for the officials of the market, offices for business purposes, lock-up shops and stores. The building is divided on the front below the first floor by a large central archway and road, for vegetable carts and waggons, to be used as an entrance only. On either side of the archway entrance the offices have their entrances direct from the street, while access is also obtained through doorways leading direct from the market. At each end of this building a lock-up shop is placed, and over the same, on a mezzanine floor, storerooms are provided. The superintendent's office and committee-room are situated on the first floor, in a central position overlooking the market. The weights and measures inspector will use one of the lock-up shops. Lavatories and conveniences are situated on the mezzanine floor. The whole of the other portion of the site is to be used by the wholesale vegetable and fish merchants. A roadway, 25 ft. wide, runs through the market, and at the sides of this twenty-three vegetable stalls are placed, also twenty-one fish stalls, with offices over, each pair being approached by a staircase. The stalls between the market roadway and Yeoman-street have double doors, so that goods can be delivered from the latter as well as the former. The vegetable stalls are all fitted with collapsible gates. The roof runs at right angles to the roadway. A fish washing-room for the hawkers is provided near to the large exit in Yeoman-street. Between the main walls of this portion of the building, which is carried on an arcade of elliptical arches and piers, is a 51-ft. steel-spanned roof covered with pantiles, and having light introduced on the north side. The floor which covers the basement is constructed with rolled steel joists and girders, supported by steel stanchions. A refreshment-room for the stallholders' use is placed on the first floor over the trolley way. On either side of the large exit in Yeoman-street there are conveniences for stallholders and buyers. The total capacity of the cold stores, situated in the basement, is 32,500 ft. The engine-room contains a 32-h.p. Crossley gas-engine. The whole of the market is lighted by electricity. All the offices contain gas-stoves as the heating medium. Most of the front building is faced with terra-cotta, having a semi-glazed plinth. The dressings of the other external portions of the buildings and portions of the interior are of the same material. The external facings of the market proper are Woodville sand-faced bricks, and the internal facings are of Whitwick white bricks. The roof of the front building is covered with Broseley tiles, while the whole of the other building is covered with pantiles and glazing. All the large archways are fitted with folding collapsible gates, with decorative wrought-iron scroll-work over. The roadway is formed of asphalt, and the stalls and standings have been laid with granolithic concrete. The lobbies of the front building are laid with Roman and Venetian marble mosaic. Mr. Walter Brand was the architect, Mr. Thomas Herbert the builder, and Mr. W. C. Lee the clerk of the works.

SANITARY AND ENGINEERING NEWS.

THE NEW BERMUDA FLOATING DOCK.—There has just been launched the great floating dock which has been built to the order of the Admiralty by Messrs. C. S. Swan & Hunter, of Wallsend-on-Tyne. The structure is 545 ft. long and the side walls are 53 ft. 3 in. high. The general shape in cross section is that of a letter U, but on the outside the rounded bottom is square, so that the exterior outline is rectangular like a barge. The width between the walls is 100 ft. clear, and, as the walls themselves are over 13 ft. across, the total width of the structure must be about 130 ft. The dock is capable of lifting out of the water a ship of 17,500 tons in weight and drawing 32 ft. of water. The dock is intended to take the place of the existing structure of the same kind now at Bermuda. The price of the dock has been stated to be 250,000*l.* The new dock has been built from the plans of Messrs. Clark & Standfield, of Westminster. As it has no end gates it will take ships of the greatest length within its lifting capacity as to weight. Its first duty is to lift line-of-battle ships of the first class of about 400 ft. long and 15,000 tons displacement, which will have a bearing length on the keel blocks of 343 ft. The dock consists of five chief parts. They comprise three pontoons, which form the main lifting portion of the dock. There are the two side walls, which are chiefly designed to afford stability, although they afford a certain amount of lifting power. The centre pontoon is 300 ft. long and is rectangular in shape, whilst the two end pontoons, which may be described as the bow and stern, have each a length of 120 ft., of which a portion is formed so as to afford a somewhat bluff bow. This will make the dock much easier to tow across the sea. What are known as the altars of a graving dock are formed in the side walls so as to facilitate shoring-up when a ship is docked. For docking armour-clad ships special provision has been made for supporting the belt by working in a strong channel to take the heels of the vertical shores. The side walls have in them two large openings by which light and air are more readily admitted to the bottom of the dock. The pontoons are divided into forty chambers, and the side walls have sixteen divisions in all. Each of these divisions has its separate suction pipe leading to the pumping machinery by which it can be emptied. Very complete provision is made for rendering the pumping arrangements interchangeable. There are four 18 in. centrifugal pumps placed in each wall, together with their motive machinery and boilers for generating steam. The working of the whole of the arrangements is carried on from a central position at the top of each tower. There are the usual warping bollards, capstans, fairleads, &c., as well as an electric light installation. There are also travelling and swinging electric cranes, which are driven by a separate electric machinery. Both the lighting and lifting installations are, however, interchangeable.—*Times.*

THE LONGTOWN WATER SCHEME.—The Longtown District Council, having on hand a scheme for the supply of two rural parishes, including the village of Longtown, with water, at an estimated cost of 17,000*l.*, decided recently to accept the tender of Messrs. Drummond, Dumfries, to do the work for 10,317*l.* Messrs. Drummond declined to sign the conditions, on the ground that while the specifications on which the contract was based provided that the pipes should be "of even thickness and true bore throughout," the conditions stated the specific way in which the pipes ought to be cast, viz., "vertically cast, socket downwards, in dry sand." The contractors' contention was that the ordinary trade reading of the specifications was that

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the pipes should be cast on the slope, and that if the conditions were insisted upon their tender would have to be increased by 1,793*l.* This made their tender 522*l.* higher than another which had been passed by. They intimated their willingness to withdraw from the contract provided that their expenses up to date and the claims of founders, who had refused other work in order to fulfil Messrs. Drummond's order, were paid by the Council. The Council's engineer expressed the opinion, which he said was supported by five of the firms who had contracted for the work, that the trade reading of the clause "of even thickness and true bore throughout," was that the pipes should be vertically cast, as this was the only means of ensuring even thickness and true bore. The Council had accordingly offered to make the condition to read the same as the specification, but had received no acceptance of the altered conditions from Messrs. Drummond. The Council accordingly decided to enter into negotiations with the firm whose tender was next on the list, viz., Messrs. Brebner & Co., Edinburgh. They had tendered to do the work for 11,588*l.*

SOUTH WEST INDIA DOCK EXTENSION. — The new entrance lock to the South West India Dock was formally opened on the 12th inst. In order to meet the growing demand for more accommodation for large vessels in the Port of London, the directors of the company have for the last two years been carrying out extensive alterations and new works at the eastern river entrance to the South West India Dock. These works have just been completed, and vessels 450 ft. long and of a carrying capacity of 6 000 tons will be able to enter the dock by the new lock. The dock is now, with the exception of Tilbury, the deepest in London, having a depth of 29 ft. With its basin it has an area of 32 acres, and the quay walls are of sufficient length to accommodate twelve ships each 450 ft. long, in addition to a few smaller vessels. The length of the old entrance lock has been increased from 300 ft. to 480 ft., while the original depth of 27 ft. on the sill in the centre, reduced to 24 ft. at the sides of the invert, has been increased to 29 ft. on the sill and invert. In order to carry out the work the water was excluded from the site by means of a timber caisson across the lock at the river end and a semicircular dam in the basin. The extra pair of gates required for the extension were obtained from another part of the dock where they were no longer required. As the mud in the docks causes great inconvenience in working the gates, iron pipes connected with the sluice culverts have been embedded in the concrete of the new gate platform, so that the act of lowering the water in the lock draws away the mud from the roller paths. The sluices are in duplicate, one set being worked by hydraulic power, and the other by hand, in case of a breakdown. In addition to the reconstruction of the lock, a sewer has been constructed under the lock for the London County Council to carry the drainage of the Isle of Dogs, and to replace the old sewer in the bed of the river, which was in a rather dangerous position across the entrances to several docks. The cost of the works, including the sewer, has been about 52,000*l.* The design and carrying out of the works were entrusted to the company's late engineer-in-chief, Mr. H. C. Baggallay, and the contract was let to Messrs. C. H Walker & Co., of Westminster.

LEEDS NEW WATERWORKS.—A description of the Leeds waterworks, with special reference to the scheme recently sanctioned by Parliament for the extension of the undertaking, was the subject which engaged the attention of a meeting of the Yorkshire College Engineering Society on the 10th inst., the lecturer being Mr. E. J. Silcock, M.Inst.C.E., of Leeds. The lecturer, whose remarks were illustrated by maps and diagrams, reminded his audience that prior to 1837 the water supply of the city was pumped from the river Aire in the neighbourhood of Leeds Bridge; and a water-wheel, the framework of which was still in existence, was used to develop the necessary power for the distribution of the water to the population. It was hardly necessary, he thought, to say that the source from which this water was obtained was now, and had for some time been, totally unfit for the purpose of drinking. Proceeding, he described the formation of the Leeds Water Company, and the subsequent taking over of the works by the Corporation in 1852. He also described in some detail the extension of the works in the Washburn Valley, the drainage area of which, he said, was 22,000 acres. The area above the embankment of the Swinsty reservoir, from which the supply of Leeds was taken, was 17,047 acres; the available supply of water from the valley being 18,500,000 gallons per day. At the present time the consumption of water in Leeds was at the rate of 16,000,000 gallons per day, and it was the nearness with which the actual consumption approached the available supply that rendered it necessary for the Corporation to secure powers for the construction of additional storage reservoirs in the valleys of the Burn and the Laver. The present waterworks of the Leeds Corporation in the Washburn Valley were surrounded on the north and west by the gathering grounds of Bradford, Yeadon, Shipley, and other towns; while in the valley of the Nidd the ground was also occupied by the Bradford Corporation, so that, excluding the ground already occupied by existing or projected waterworks, there remained no area which could be utilised for the purpose of collecting water on any scale at all commensurate with the requirements of the city other than that in the valleys of the Burn, the Laver and the Skell. In estimating the quantity of water required, a consumption of 40 gallons per head per day was fixed upon as being probable within a short time. The present normal consumption in the country was 20 gallons per head per day, but Leeds was considerably above the normal standard, and the rate was increasing by 2½ per cent. per annum. The rate of increase in the consumption during the past decade in Leeds had been 16·75 per cent. while that in all other county boroughs outside the London area was only 13·25 per cent. The problem to be faced was how to double the present supply of 18½ million gallons per day, and it was found that the valleys of the Burn, the Laver, and the Skell would provide 21·4 million gallons. Harrogate, however, secured about 3,000 acres of the area, representing two million gallons, and owing to the opposition of the riparian owners, and particularly of Lord Ripon, the projected extensions in the Skell Valley were abandoned, with the net result that the increased supply for Leeds had been reduced to 15·6 million gallons per day. This would be collected in three reservoirs in the Burn Valley, known as the Colsterdale, the Leighton, and the Healey reservoirs, with a total capacity of 4,086 million gallons; and two reservoirs in the Laver Valley, known as Carlsmoor and Laverton reservoirs, with a capacity of 1,555 million gallons. These reservoirs, said the lecturer, would discharge into the Swinsty reservoir by means of iron pipe aqueducts and a tunnel passing through the ridge dividing the watersheds of the Nidd and the Wharfe, and entering the Swinsty reservoir at a point 10 ft. above the present top-water line. Having dealt with details of construction, the lecturer concluded by referring to the cost of the undertaking, the original estimate for which amounted to two and a half millions sterling, a figure which, for the modified scheme, has been reduced to 2,200,000*l.*

FOREIGN.

FRANCE.—M. Girault, the architect of the Petit Palais, has obtained the Lheureux prize; the decision which we have already suggested as the only right one.——M. Rodin's sculpture pavilion, which will be remembered at the 1900 Exhibition, has been rebuilt at Meudon.——The remains of a fortified Roman camp have been found at Mont Jouer, near Guéret, in the course of some excavations.——The town of Valence is about to open a competition for the laying out of a new public garden, to be called the "Parc Jouvet."——The exhibition of the works of Falguière is open at the Ecole des Beaux-Arts. One of the works exhibited, the "Combat des Bacchantes," has been purchased by the State for the Luxembourg Museum.——An establishment is to be opened shortly in the Boulevard des Italiens, near the Opéra Comique, for the sale of Sèvres porcelain manufactures.——M. Coutan has been commissioned to complete the bust of Mme. de Sévigné, commenced by the late M. Massoule, and which is intended for the small town of Grignan.——The jury in the competition opened by the town of Royau for the construction at Pontaillac of a sea-bathing establishment, has awarded a second premium to M. Piquard, of Epernay, and a third to MM. Sonès and Geslin, of Paris. The first premium was not awarded.——M. Paul Raffet, architect, of Tours, and a member of the Société Centrale des Architectes, is dead, at the age of fifty-five. He was a pupil of Constant-Dufeux, and the architect of important buildings in many of the Departments of France—mairies, private houses, villas, &c.——M. Louis Grolleron, known for twenty years as a military painter exclusively, is also dead, at the age of fifty-four. He began as a decorator, and became subsequently a pupil of M. Bonnat. His first pictures were works of *genre*, but in 1882 he obtained notice for his military painting "Combat at a Mill in the Outskirts of Paris, 1870," and subsequently devoted himself to this class of picture, for which he received awards and medals in several subsequent years, including a bronze medal of the Exhibition of 1900.

AUSTRALASIA.—An influential deputation, representing the Institute of Architects of New South Wales, has recently waited upon the Under Secretary for Works to impress upon the Government the desirability that designs for public buildings of a national character should, in future, be thrown open to competition, especially in the matter of the proposed model dwelling tenements to be erected in "The Rocks" area, Sydney. As matters stand at present in New South Wales, all the principal public buildings are carried out by the Government, and this means that all the designs come from one State office—the Government architect's branch of the Public Works Department.——The interior of the new stock exchange, a building recently opened in Pitt-street, Sydney, has been largely decorated with marble from the works of Messrs. Creak & Ford, and New South Wales marble generally is attracting considerable attention amongst architects in the colony.——A large hotel is now being erected opposite the railway station, Parramatta. It is to be of four stories, and to contain about forty rooms. The building will be divided into two parts, one for residential and the other for business purposes. The architect is Mr. Varney Parkes, of Sydney.

AUSTRIA-HUNGARY.—The Minister for Fine Arts in Vienna has invited sketches from Austrian architects for a Roman Catholic parish church, with a view to encourage the purely artistic aspects of the profession. The first and second premiums are 3,000 and 1,000 kronen respectively. It is not stated whether the accepted designs will be utilised or not, and we gather that the chief object is to encourage young architects to pay more attention to church architecture than they have been doing for the past few years.——The same Office has also invited designs for a reliquary from Austrian sculptors.——The Municipality of Buda-Pesth are about to erect a large monument to the memory of Kossuth, and the architectural bureau has thrown open the competition to all Hungarian sculptors. As this is to be an imposing architectural feature in the city, and as much as 13,000 kronen are offered as premiums to the three first-placed competitors, there will doubtless be a spirited competition.

UNITED STATES.—A movement is on foot in Boston to erect a new City Hall. It is estimated that by collecting together the various branches of the municipal offices, which are at present scattered over the city, one large building to house these departments would be much cheaper than by continuing the present method. The movement has the support of the Mayor and other influential citizens. ——A new post-office, a court-house, and some other public buildings are to be erected in Cleveland, Ohio, and it is suggested that the buildings shall be so arranged as to improve the effect of all by suitable grouping. The Federal Government has pledged itself to do all that lies within its power to further the scheme, and has already purchased some of the land on the proposed site.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —The Scottish Freestone Quarries Co. (Thornhill, Dumfriesshire) have appointed Mr J. Percy Day, of 3 Victoria-street, as their London agent for the sale of their "Closeburn Red Freestone," and Messrs. Kirkpatrick Bros., of Trafford Park, Manchester, as their agents for Lancashire. Messrs. Kirkpatrick will keep a large supply of the stone at their yard. ——Mr. J. F. Fogerty and Mr. W. Clifford Parnell, architects, of Bournemouth, have entered into partnership under the style of "Fogerty & Parnell," at Belfast House, Gervis-place, Bournemouth, where the businesses of the late firms of Pinder & Fogerty (formerly Kemp-Welch & Pinder) and Pearce & Parnell (formerly Pearce & Offer) are now combined. ——Mr. Edwin O. Sachs, architect, of 3, Waterloo-place, has taken into partnership Mr. G. Spencer Hoffman, and the firm will practise under the style of Edwin O. Sachs & Hoffman.

THE "GARLING" PATENT SASH.—Messrs. Ellen & Co., of Fenchurch-street, have submitted to us a model of this patent, in which the sash is clipped by small metal balls in the exterior stiles working into holes in the window-frame, and pressed forward by springs behind them, which allow them to give and pass the holes as the sash is raised, until it is left in the desired position and the balls clip into the nearest holes and keep the sash in position. It of course does away with pulleys and weights, but it is rather noisy in lifting and lowering, owing to the rattling of the balls in passing the holes; and of course a spring is always an element of weakness in these contrivances; but the sash is made so that the springs can be repaired and replaced. It may answer for small sash windows. None of the contrivances of this class are applicable to large and heavy sash windows, which must have some balance weight to render them convenient and safe in working.

OVERCROWDED LONDON.—Before the Society of Arts, on the 12th inst., Mr. W. L. Madgen, Member of the Institution of Electrical Engineers, read a paper on "Industrial Redistribution" as the remedy for the overcrowding of large towns. London being taken as a crucial instance, Mr. Madgen declared against the proposals of the County Council on the ground that while conquering the space problem, it was creating a time problem. For how was a resident as Tottenham or Norbury to be whisked through the air to his work in the industrial quarters? Even if its most idealistic schemes were temporarily successful, London would become so much more attractive, and the population would increase faster than ever. The author's belief was that the best practical way to deal with the congestion of population was to aim at the creation of home colonies, in which factories and cottages, places of recreation, and so forth, may all grow up together. Looking through the directory you find lists of makers who could carry on their work more comfortably and efficiently elsewhere. Instead of the County Council's ideal of leaving the factory at Bermondsey, with the proprietor at Hampstead, the manager at Sydenham, the clerks at Forest Gate or Wimbledon, and the workmen at Tottenham or Norbury, all struggling twice a day to find room in railway carriages or tramcars, you might have business and homes within short walking distance, the staff better

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housed, better fed, more comfortable, more able, and contented. London would have been happier if it had not been allowed to grow into one of the largest manufacturing towns in the world; if we had never been left to puzzle why Peek, Frean, & Co. should make biscuits at Bermondsey, while Reading was good enough for Huntley & Palmer; or why Cadbury's chocolate can find quarters at Bourneville, while Crosse & Blackwell's jams and pickles settle down in Soho; or why the London and South-Western Railway works should be at Nine Elms and the Great Eastern should employ 5 000 men at Stratford, while such places as Crewe and Swindon suit the purpose of other great railways? Mr. Justice Grantham had observed that "Doultons bring their clay from Dorsetshire and Cornwall, their coal from the Midlands, their salt from Cheshire, to London; they then use an enormous quantity of valuable and costly water, and having made their pipes and sanitary ware, send them back to the source of origin of their component parts, as well as to all parts of the world." He instanced also the great furniture factories and engineering works which are out of place in London. In Mr. Madgen's opinion the necessary conditions to bring about this change are the provision of cheap driving power for machinery, increased traffic facilities by light railways, the improvement of the canal system by the use of mechanical haulage, and the intelligent design of industrial building estates. The first three of these requisites will be supplied by electricity, but at the dawn of the twentieth century the Legislature still allows local authorities the power of veto over comprehensive electrical projects. There exists already a tendency for industry to scatter over a larger area and settle in smaller centres, and this movement should be encouraged by the breaking down of local obstruction. If the migration of industry once set in on an important scale, if the example of those few manufacturers who have within recent years settled on such districts as Bedford, Chelmsford, Lincoln, Loughborough, Newark, and Rugby be accelerated by cheap power supply and improved traffic facilities, no question need arise of compelling the factories to move away.

HISTORY OF ARCHITECTURE.—The first of a series of lectures on the "History of Architecture," by Mr. Hugh Stannus, F.R.I.B.A., was given in the Municipal School of Technology, Whitworth-street, Manchester, on the 12th inst. The lectures will be given every Wednesday evening until July 23rd, and the subject of architecture will be treated in three divisions: Ancient, Romanesque, and mediæval and modern architecture. On the 12th inst. the lecturer dealt with the evolution of remote Egyptian architecture, and dealt with the geography of the Nile Valley. He explained that the granite and stone blocks in the cliffs at the edge of the Nile Valley at Assouan were floated down. Timber being scarce, except the expensive cedar from Lebanon, they modelled their stonework on their own use of the branches of the palm. He showed how the cavet and torus mouldings were designed from the use of the palm branches in primitive structures. Views of the cliffs of rock, some 1,000 ft. high, were shown, and those of the Valley of the Tomb of Kings, the Necropolis of ancient Thebes. The evolution of the Egyptian column, as seen in the tombs and temples, was demonstrated as first square, then octagon, and so on, until finally the flat facets in the hexadecagon columns were fluted. The primitive use of maize stalks in bundles was the source of the ideas applied to architecture in stone. The favourite types of capitals were the lotus bud, the flower, drooping leaves, the Ptolemaic, and the Hat-Hor. At first the lotus flowers were tied round the tops of the pillars in rejoicings for a good inundation of the valley after which the lotus was most luxurious. The second type probably sprang from the flower of the papyrus. The third was only found in one temple, and was copied from the capitals in the Troad, Mesopotamia, and Asia Minor generally. The Ptolemaic was an Egyptian adaptation of the Corinthian. Very interesting, too, was the demonstation of the evolution of the lotus shaft or pillars. The lecturer then dealt with the national character of the people, the feature being their intense seriousness and their superstition. The next lecture will be on Egyptian remains. The course, of twenty lectures, is illustrated by lantern slides.—*Manchester Courier*.

ST. MARK'S COLLEGE, CHELSEA.—An appeal is made for subscriptions towards a sum of 5,000*l.* to meet the cost of proposed additional buildings—comprising new lecture-rooms, a workshop, a science laboratory, and improved accommodation for the resident staff—in order to place the institution in a condition of modern educational efficiency. The buildings, and grounds of about eleven acres, were purchased for, it is said, 9,000*l.*, as a training college by the National Society in 1840; Blore added the quadrangle some ten or twelve years afterwards. The house, formerly known as Stanley, or Stanley Grove, House, had been the home at intervals in 1815-40 of William Richard Hamilton, the virtuoso, who added an east wing for his collection of casts of the Elgin marbles; it had been occupied by Admiral Sir Charles Wager, Walpole's intimate friend, who died there May 24, 1743, and was buried in Westminster Abbey. The property was afterwards bought, in 1777, by Mary, Countess of Strathmore, who there cultivated many rare exotics. The house had been built at the end of the seventeenth century on the site of one built for himself by Sir Arthur Gorges, the friend of Spenser, whose widow sold it, together with some adjacent land known as the Brickills, in 1637, to their only daughter, the widow of Sir Robert Stanley, whose descendants lived there until the death of William Stanley in 1691.

THE LAND REGISTRY, LINCOLN'S INN FIELDS.—For the new buildings of the Registry the demolition has been begun of the block of houses and shops, Nos. 4, 5, 6, and 7, Serle-street, and Nos. 1, 2, and 2½, Portugal-street (north side). On April 1, 1892, the Middlesex Registry of Deeds, established by an Act passed in Queen Anne's reign, was incorporated with the Land Registry, of which the offices were transferred a few years ago from the terrace, Staple Inn, to Lincoln's Inn Fields. Consequently upon a considerable increase of the business of the Middlesex Registry additional space for it was obtained in September, 1899, by the conversion of the offices and courts vacated by the Official Referees in Portugal-street, where at No. 6 on the ground floor a large room has been fitted up for the inspection of ordnance maps in respect of the new compulsory registration of title to land, upon sale, in the City and County of London. Colonel F. P. Washington, late R.E., was appointed to the directorship of the map department.

YORKSHIRE FEDERATION OF BUILDING TRADES EMPLOYERS.—About 150 members of the Hull Branch of the Yorkshire Federation of Building Trades Employers attended the annual dinner at the Grosvenor Hotel, Hull, on the 13th inst., Mr. E. Good, the President, in the chair. Mr. T. Marsden, Vice-president, proposed the patriotic toast, coupled with the names of Mr. B. S. Jacobs and Mr. P. T. Runton, architects. Mr. J. Watson, surveyor (Hull), proposed "The National and County Federations." He said that trade throughout the country was at a low ebb, and the question arose how the difficulty would have to be met. He thought it would be very much to their advantage if, instead of decreasing wages, they directed their efforts to the weeding out of inferior workmen. They might also formulate a better system of apprenticeship. He was closely connected with a charity under which 300 fatherless children were apprenticed, and a considerable number of them belonged to the building trades. These children had the advantage of attending technical classes, and here he would emphasise the fact that the welfare of this country in future depended largely upon apprentices taking proper advantage of technical education.—Mr. J. Dawson, Vice-president of the Yorkshire Federation (Huddersfield), replied. He regretted the existing antagonism between capital and labour in the building trade. There was no necessity for it, and on the part of employers it was very much against their wish. With regard to the lowering of wages, the employers wanted to do what was right and fair, and if they had a good man they wanted to pay him a good wage. The Yorkshire Federation long ago passed a resolution asking its members as far as possible not to reduce wages, but to combat restrictions and interference with the employers' liberty of action, which was detrimental to the trade and absolutely un-English. If there was one body that was responsible more than another for the "go easy" principle, it was the Corporations, which employed their own workmen. If there was a gang, say, of fifty men, twenty-five of them would be idle, and that was a state of things which no private contractor could afford. He urged the young men present to stand by the Federation, and they would be able to stand up to the men face to face on their own ground. Mr. J. M. Dossor proposed "The Hull Branch," and the Chairman replied. Speeches were also delivered by Mr. F. Beilby, Alderman Larard, Councillor Scott, and others.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointments of Messrs. J. V. Snowdon and J. Owner as sanitary inspectors in Deptford, and of Mr. C. V. Nutley as sanitary inspector in Hammersmith.

THE ELECTRICAL FITTINGS CO.—On Wednesday afternoon last, by special invitation, we inspected the new showrooms of the Electrical Fittings Co., 38, Conduit-street, New Bond-street, W. A large variety of artistic fittings for electric lighting was shown, and all the ordinary accessories exhibited were of high-class workmanship.

CROYDON AND DISTRICT BUILDERS' FEDERATION.—The annual dinner of this Federation was held on the 18th inst., at the Greyhound Hotel, Croydon. The company present, numbering between seventy and eighty, included Messrs. Samuel Page (President), David W. Barker (Vice-President) in the chair, David Waller (Hon. Treasurer), Chas. Wall (President of the Institute of Builders of Great Britain), F. W. King (President of the London Master Builders' Association), and others. The loyal and patriotic toasts having been duly honoured, Mr. Charles Hursey, J.P., proposed the "Croydon and District Builders' Federation," and urged the need for Arbitration Boards to decide between builders and the various trade unions. The Chairman, in replying, spoke of the work of the Association during the past year, and said that the need of organisation was being more and more felt in the district. He invited those few local builders who still remained outside the Association to become members and still further strengthen the position of builders in the borough.—Mr. S. Page then proposed the "London Master Builders' Federation," and he coupled with the toast the name of Mr. W. F. King, who replied. Mr. King expressed a wish that in the near future the Croydon Association might be able to join hands with the other associations round London in all matters affecting the trade generally, although at the same time reserving to themselves the right to manage their local affairs, as they have hitherto done to advantage. "The Town and Trade of Croydon" and "The Visitors" were also toasted.

CAPITAL AND LABOUR.

DEPRESSION IN DUNDEE BUILDING TRADE.—Dundee building trade is at present experiencing a period of acute depression. Partially owing to general stagnation in the property market, and in a greater degree because of the recent severity of the weather, building operations in all branches have been practically at a standstill, and many tradesmen in consequence find themselves out of employment. Masons in many instances have been idle for three months, while slaters and others engaged in allied trades are in a somewhat similar position. It is the joinery trade, however, that has felt the pinch most acutely. Prior to the New Year holidays, a growing slackness manifested itself, ultimately resulting in wholesale dismissals of workmen from various establishments in the city. Last month the ranks of the unemployed were materially reduced by the removal of about thirty associated tradesmen to situations found for them in London. Since then, unfortunately, no improvement in trade has taken place, and additional men are being weekly suspended from the workshops.—*Dundee Advertiser*.

MAIDSTONE BUILDING TRADE DISPUTE.—The award of Mr. Askwith, Board of Trade arbitrator in the dispute between the masters and men engaged in the building trade in Maidstone, has been received. The masters had made a new rule to the effect that the men should commence work during the months of December and January at eight o'clock in the morning and continue working without any break till the dinner hour, and the arbitrator decides in their favour in regard to this. The men, however, succeed in their contention that the rate of pay for overtime should commence after an ordinary day's work instead of after a ten-hours day as proposed by the Masters' Building Association. The men also gain on a third though minor point in the dispute.

LEGAL.

APPEAL BY CONTRACTORS.

THE case of Laing, Wharton, & Down, Limited, *v.* Spiers & Pond, Limited, came before the Court of Appeal composed of the Master of the Rolls and Lord Justice Mathew on Saturday, the 15th inst., on the appeal of the plaintiffs from an order of Mr. Justice Jelf in chambers, dated January 23, 1902, affirming the order of the Master on a summons for directions whereby he ordered that the action should be stayed and referred under the terms of the contract to the engineer of the defendants.

Mr. Spencer Bower appeared as counsel for the appellants; and Mr. Montague Lush for the respondents.

It appeared from the statement of Mr. Spencer Bower that the action was brought by the plaintiffs, a firm of electrical engineers, to recover from the defendants 1,576*l.* 8s. 1d., the balance they alleged to be due to them under two contracts, one in respect of work done in the electric lighting of the Hotel Metropole at Blackpool, and the other in respect of work done at the Granville Hotel, Ramsgate.

Lord Justice Mathew said he understood that the action was stayed by the Master and the Judge because of the arbitration clause in the contracts.

Mr. Spencer Bower said that was so, and what he wanted to get out of, if he could, was a reference to the engineer of the other party. He should ask their lordships to say that as there were points in dispute under the contract not referred to the defendants' engineer, the whole of the matters must be tried. If there were some matters referred to the arbitrator under the contract and some not, there was authority for saying that the Court would not order two fights, but would direct that the whole of the matters in dispute should be tried together in the ordinary way. He should ask the Court to say that the action should proceed, and then, if necessary, be referred to an official referee. The learned counsel went on to state that the plaintiff company went into liquidation before the work in question was completed, and the defendants alleged that the work was not properly done, and called in other contractors to complete it. Apart from the question of defective work, there were numerous questions with regard to the work and the prices charged for it. The defendants had paid during the course of the work 800*l.* on account in regard to each of the contracts to the plaintiffs. The learned counsel said that one of the main questions in dispute was as to extras or additional work, and which, he con-

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tended, was not under the arbitration clause referred to the engineer of the defendants. The only matters referred to that gentleman were disputes relating to the quality of the workmanship and materials.

The Master of the Rolls: The point is that he is not appointed arbitrator to decide whether extras were or were not extras?

Mr. Spencer Bower: Yes, that is the whole point. I am most anxious that the case should go before an Official Referee. I not only consent to that course but ask for it.

Mr. Lush submitted that on the proper construction of the contracts the question of extras was referred to the arbitrator, viz., the defendants' engineer.

The Master of the Rolls in giving judgment, said he thought it was clear from the terms of the contracts that the parties intended that all disputes arising under the contracts should be referred to the defendants' engineer, and that the plaintiffs must submit to his jurisdiction.

Lord Justice Matthew concurred, and the appeal was dismissed with costs.

ACTION BY AN ARCHITECT.

AT the Manchester Assizes on the 10th inst. Mr. Justice Bucknill, sitting without a jury, resumed the hearing of an action which was part heard at the Lancaster Assizes. The plaintiff was Mr. Herbert Howarth, an architect, of Morecambe, who sought to recover from Messrs. John Gardner and John Scott, joint proprietors of the Alhambra Palace, Morecambe, the sum of 370*l.* 6*s.* 8*d.* for professional services in connexion with the building of the Alhambra. The total cost of the structure was 25,700*l.*, and the plaintiff's charges amounted to 1,539*l.* 19*s.*, of which a sum of 1,160*l.* 12*s.* 4*d.* had been paid. The action was brought to recover the balance. The defence was that the plaintiff did not render certain services for which he claimed, and that the commission to which he was entitled and which he had been paid was 5 per cent. on 22,581*l.* 10*s.* 6*d.*, and not upon 25,700*l.* Negligence was also alleged, and for this a sum of 230*l.* was counter-claimed.

Mr. Marshall Robinson, architect, of Bolton, called in support of the plaintiff's case, gave it as his opinion that the charges were quite reasonable.

Mr. H. Ross, architect, of Accrington, gave similar evidence. He added that there was not at present an established custom whereby architects were entitled to charge commission in connexion with an electric light installation. Electricity was too recent for the establishment of such a custom, but the charge was usual in the case of gas fittings.

Mr. Samuel Wright, building and quantity surveyor, of Morecambe, agreed with the evidence given as to the measurements.

Evidence was then called on behalf of the defendants. Mr. Joseph Parkinson, architect, of Morecambe, stated that, in his opinion, the plaintiff was not justified in charging in respect of the draperies, decorating, or electric lighting. It would have been different if, as architect, he had been asked to get estimates for these things.

Other witnesses were called to prove that the plaintiff should only have charged for those things he actually superintended.

The case was adjourned.

INJUNCTION GRANTED AGAINST A CORPORATION.

THE case of Wilkinson *v.* the Corporation of Newcastle-on-Tyne came before Mr. Justice Joyce in the Chancery Division on the 17th and 18th inst., in which the plaintiffs claimed an injunction to compel the defendants to remove a piece of connecting tram line placed round the corner of the plaintiffs' premises which the plaintiffs alleged was not authorised by their Act and was not shown on their deposited plans. The deposited plans showed a tram line round the corner of Pilgrim-street and Moseley-street, opposite to the plaintiffs' premises, but none round their own corner, and it was the additional line round their own corner to which they objected. The defendants contended that the line in question, although not specifically authorised, was in fact authorised by some general words in Section 7 of the Act.

Mr. Younger, K.C., and Mr. R. J. Parker appeared for the plaintiffs; and Mr. Hughes, K.C., and Mr. T. H. Watson for the Corporation.

It appeared from the opening statement of Mr. Younger that the plaintiffs were a firm of solicitors in Newcastle, and were the owners in fee simple of valuable property situate at the corner of Pilgrim-street and Moseley-street, Newcastle, the site of which they purchased in 1898 for 20,000*l.* On this site the plaintiffs built offices, the ground floor being occupied by the Norwich Union Fire Office, and the rest of the building by other tenants. It was incumbent, said counsel, that express notice should be served on the frontagers in regard to this tramway, which must be not less than 9 ft. 6 in. from the pavement. The defendants denied having contravened the Act and traversed the other allegations in the statement of claim, and said that the construction of the tram lines was completed before the action was commenced. The learned counsel said that if the work of the Corporation was to be justified under Section 7 of the Act, it must be on the ground that it was a junction. He submitted it was not a junction. The word "junction" as used in the Act of Parliament showed that it meant in every case a point of contact between two lines. There was one junction expressly pointed out on the deposited plan, and this was a junction in Pilgrim-street, to the south of the plaintiffs' premises. The court could not construe the words "works or conveniences" in Section 7 of the Act so as to extend to a fresh line of tramway. If these tramways remained opposite to the plaintiffs' premises the free access to them would be practically cut off so far as carriages were concerned. The injury thus caused would be accentuated if the original design of the plaintiffs in regard to their property was carried out, and the premises now occupied by the Norwich Union Fire Office and others were converted into shops. Since the action had been commenced the plaintiffs had been served with another frontagers' notice by the Corporation, who were now promoting a Bill in Parliament to authorise the construction of the tramway they had already made. He asked his Lordship to grant the plaintiffs the relief they sought.

Mr. Hughes, for the defence, submitted that the Corporation, in applying to Parliament, were simply striving to put their rights beyond dispute, and that the works complained of were necessary and proper junctions.

In the result, his Lordship, after hearing evidence, gave judgment, ordering the Corporation to remove so much of the rails as was not shown on the deposited plans; but he suspended the operation of the injunction over August 31, and gave defendants liberty to apply for an extension of the time.

In the meantime, the defendants undertook not to use the piece of the tramway in question.

The defendants were also ordered to pay the costs of the action.

A BUILDING DISPUTE, DALSTON.

REFERRING to the report in our last issue, page 167 *ante*, the building dispute case came on again on Friday last week, the District Surveyor, Mr. Henry Lovegrove (not James, as printed in our last issue) reported that the defendant intended to comply with his certificate, and the work was in progress.

CLAIM BY AN ARCHITECT.

THE case of Battson *v.* Lewis was heard by Mr. Justice Wright in the King's Bench Division last week—an action by the plaintiff, an architect, to recover from the defendant 67*l.* 3*s.* for work done for the defendant in the erection of a house in East-side-lane, Woking.

The plaintiff's case was that in July, 1899, he was employed by the defendant to prepare plans for the house in question. He prepared the necessary plans, which were subsequently altered to the defendant's order. He (plaintiff) superintended the erection of the house, which cost about 2,500*l.* to erect, and gave the necessary directions for certain alterations, such alterations being with the approval, sanction and consent of the defendant. The plaintiff had been paid 60*l.* 10*s.* on account, and now sued for the balance of his fees.

The defence was that the plans were drawn in a negligent manner, causing great expense and damage to the defendant. The defendant counter-claimed against the plaintiff for 110*l.* 4*s.* 1*d.*, the amount he alleged he had to spend in consequence of the plaintiff's plans being defective.

In the result, his Lordship, after hearing evidence, in giving judgment, said it was impossible to get exactly at the rights of the case. The plaintiff had admitted that he had blundered. It was clear to him that the defendant's claim against the plaintiff was well founded to some extent. He did not think that any substantial figure of damage had been made out, but still, when a professional gentleman was paid to do professional work and then it turned out that his plans were imperfect, one did not expect to pay the same fees as if the plans were perfect. His Lordship said he should allow the defendant 30*l.* on his counter-claim, and the result would be that that sum would be reduced from the plaintiff's claim and given to the defendant in settlement of his counter-claim. The plaintiff would have the costs of the claim and the defendant the costs of the counter-claim.

Messrs. Dodd and McCowan appeared as counsel for the plaintiff, and Mr. Montague Lush for the defendant.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

18,457.—A METHOD OF CASTING CEMENT PIPES: *C. F. Kielberg.*—The inner cylinder of the apparatus is adapted so as to ascend and descend without turning, and whilst the mould is rotated and carries the cement round with it, at the same time raising the cylinder as it presses against helical projections therefrom. The apparatus, which is available for making pipes of cement or similar material, is more fully specified in Nos. 18,353 of 1899, and 9,131 of 1900.

18,459.—IMPROVEMENT OF FIREPLACES: *F. Alves.*—The inventor contrives that some air shall flow through the front and bottom bars to a box of the ashpit, and so into a chamber at the back of the grate and thence through lower and upper rows of holes. Confer also No. 4,910 of 1899.

18,463.—APPLIANCES FOR THE DOORS OF THE CAGES AND WELLS OF LIFTS: *P. D Root.*—A spring catch that, when pushed outwards, will be disengaged by a bar that projects from the cage, holds the well-door (that runs upon rollers) closed, on the well door are vertical bars that are passed on their outside by vertical bars on the cage-door; thus, as the one door slides to open on its rollers, the other is carried with it. The cage will be locked at a floor by means of projections which prevent a vertical movement of the bars upon the cage door, so that both doors will become shut before the cage is left free to move.

18,467.—A SAFETY APPLIANCE FOR LAMPS: *G. Grimm.*—In order that the lamp may not be tilted or upset, the base of its pedestal or standard is rested upon a sunken or hollowed disc, to which the pedestal is secured between pivoted arms that are detachably fastened with a chain through their loops. For additional security, the disc may be screwed through its centre by a screw to a socket that will fit into a table, shelf, &c. In another form there are radial wires which join a small middle plate to a ring, and the inner ends of the other wires that hold the lamp standard are chained together

18,486.—MEANS OF HEATING BUILDINGS: *R. Maclaurin and A. F. H. Moffat.*—Radiators utilise hot gases from smokeless fuels and from lamps or gas jets. For a gas or an oil-lamp fireplace the front plate, made of some good conducting metal, is so sloped as to turn the heat down to the floor, a non-conducting back plate being placed against fire-brick, and the hot gases are directed, with baffles, over the front plate on their way to the chimney. Other modifications are specified for a shell-radiator heated with gas jets, and an apparatus wherein gas jets impinge upon asbestos or fireclay balls, &c., and the hot gases flow into a radiator as described.

18,539.—GRATES AND FIRE-BARS: *C. Dieterle.*—For conducting air to the surface of the fire to consume the smoke, double bars steeply inclined are set at the sides of the grate, and projections are fashioned upon the bars, or at their ends only. In another form the grate is fitted with block gratings at each side, which may be extended to beneath the surface of the grate.

18,565. — A HOT AND COLD WATER MIXING VALVE FOR LAVATORY BASINS, BATHS, &C.: *W Thomson.*—Two separated passages convey the hot water and high-pressure cold water into a mixing-chamber, a screw-down valve closes the outlet, and has a conical, or a hollow perforated, plug upon its underside, a lift-valve is attached to the top of the hot-water pipe, and when closed is forced upon its seating by pressure of the cold water; as the screw-down valve is opened the cold water only will flow until its pressure is reduced to allow the valve to rise, and then both cold and hot water will flow, as the valve is farther opened the conical plug shuts off the cold supply, and hot water alone will flow.

18,579.—IMPROVEMENTS OF FILES: *L. M. Stewart.*—Slotted plates which are bevelled on their edges to constitute cutting-edges with their faces ground are clamped upon a core between a sliding piece and a removable head, and inclined cross-cuts are milled in the cutting-edges.

18,583.—AN APPLIANCE FOR SPREADING SEWAGE OVER FILTER-BEDS: *G. E. Ridgway.*—A cover or plate, having curved tangential channels beneath it, is mounted upon the upper end of the supply pipe, the channels are connected to others underneath a rotating stand fitted with projections, in the form of troughs, to which are also attached perforated troughs having discharge areas that can be regulated at will, and which are held up with rods from a cap which rotates upon a stationary pillar.

18,615.—A COMBINED ELECTRICAL CUT-OUT AND ELECTRO-MAGNETICAL CUT-OUT: *E. M. Hewlett.*—Suitable openings take the fuse which is connected to the terminals that are protected with arcing tips connected to them, the electro-magnet has flat extended pole-plates lined with refractory plates, and an open-mouthed box is formed of side pieces. In a variant shape a removable block carries the fuse, and spring contacts which help to keep the box in its position effect connexion with the fixed terminals.

18,625.—A VICE: *F. Long.*—A horizontal opening of the base of the fixed jaw takes a pivot pin secured to the bench, and there is a vertical opening in the base of the fixed jaw, whereby the jaws can be set either vertically or horizontally when the pin is inserted into either the one or the other hole. In the slide of the movable jaw is an adjustment screw to be turned into engagement with a nut in a block that is pivoted on to the fixed jaw and is curved so as to engage with the pivot-pin, which will be gripped to keep all the parts rigid, as the block rocks a little upon its pivot when the vice has gripped the work; otherwise, the block is extended in a forward direction and is fitted with rollers that press upwards against the slide.

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18,653.—A WINDOW-SASH FASTENER: *A. Stevens.*—A bolt, having a bevelled nose, and to be shot with a spring and withdrawn with a knob, is mounted in the meeting-rail of the lower sash, that it may engage with a slot cut in the corresponding rail of the upper sash.

18,666.—A CLAMP OR COUPLING FOR DRAIN-PIPES AND ELECTRICAL WIRE PIPES AND CONDUITS: *W. Bayliff and T. D. Bayliff.*—The clamp consists of two or more parts, each of which is fashioned with a half-rounded rim or ledge about its centre upon which the pipe-ends will rest. A coupling is made with a socket that has mouths, internally threaded and conical, for taking the filling, and has projections that will serve for its unscrewing when the joint is to be broken. For stopping or strengthening a tube or pipe, or for coupling purposes, the flanges of the clamp are adapted to interlock and to allow movement only lengthwise. Other modifications are specified of the contrivance, which is generally available for covering or closing defects, apertures, and so on, and for strengthening or other uses.

18,681.—A FIRE ALARM: *H. Simpson and R. Thomlinson.*—An apparatus for ringing either of two electrical bells has a U-shaped tube, which is joined to a frame, of which the knife-edges are carried by a fixed support. So long as the temperature remains normal a sliding-weight will balance the tube upon the edges in a horizontal position, but with an access of temperature the expansion of some liquid—such as a spirit or light oil—within one limb of the tube will displace the mercury which is contained in the lower limb of the tube, and cause it to flow into an empty space at the end of the limb. As the position of the centre of gravity becomes thereby changed a pointer upon the frame sets up contact with an insulated stopping-piece and rings one bell. Another bell will be similarly rung through a contact with another stop-piece when the temperature has become less than normal. The expanding liquid may be filled into a fixed reservoir in some instances.

18,736.—A CRAMP FOR MITERING: *J. Griffin.*—A jaw, and two bifurcated jaws upon the ends of curved bars that are pivoted together, serve for gripping the work; a screw operates the first-named jaw, being inserted through a boss at the pivot-point of the forked jaws, and the flanges of that jaw are pressed against flanges upon its arms, which draw the two forked jaws together when the other jaw is forced towards them.

18,759.—A VENTILATING CONTRIVANCE: *B. Schroer.*—A cap is fitted on to the top of the chimney or shaft, and consists of a cover which is stepped so as to become wider upwards, and has air-inlets set obliquely in its sides.

18,789.—AN ELECTRICAL ENERGY METER: *F. L. Catenhusen.*—The conductive disc of an induction motor meter for a single alternating current moves through the air gap of an electro-magnet, also between a stationary armature and a horseshoe electro-magnet, which carries highly inductive coils that are connected between the mains. On the first-named magnet are a main current coil and a co operating coil, the latter being connected in series with a high non-inductive resistance between the mains. The disc will be driven by the independent magnetical fields produced by the arrangement. Under No. 18,790 the same inventor devises a regulator for use with electricity, water, gas, and similar meters, comprising a helix which will rotate inside a cylinder containing liquid, and has a spindle that is driven by the meter.

18,794.—AN ELECTRICAL INSULATOR: *W. Chapman.*—The insulator, which is fashioned with a middle opening which can be carried by a ring, or upon a shelf, has an upper projecting shed, to be turned over either outwards or inwards, and a lower shed. Insulating material may be filled in the cavity so as to cover the head of a bolt.

18,801.—APPARATUS FOR USE WITH SAFETY LAMPS: *C. Darrah and J. G. Patterson.*—The inventors devise a portable apparatus for igniting certain safety-lamps after the kind specified in No. 9,462 of 1899, and for obviating any risk of explosion. An air-tight and gas-tight box contains the dynamo, which is turned with a handle and gearing, whilst its rotation in the wrong direction is prevented by the engagement of a pawl with one of the wheels. Pipes from an oil vessel supply a lubricant to the gearing. A plug attached to the lamp is either placed above the lid or connected to the conductors. When the lamp has been screwed on to the plug, it is hung upon a hook projecting from a standard secured to the lid of the box whilst the handle is being turned. Any unauthorised use of the apparatus is prevented by the locking of the handle to the side of the box with a screw for which a detachable key is supplied.

18,808.—A VENTILATOR FOR THE ROOF OF A BUILDING: *F. McRae.*—The portions of the ventilator that are in contact with the roof are made in the shape of a rectangular box, and have their lower and upper ends opened, the lower sides being flared or suitably formed otherwise as the roof may require. A rain-shed, with a triangular or semi-circular cross-section, is fitted above the upper and open side, and the end supports have apertures.

18,810.—MEANS OF SCREWING TUBE BENDS AND SIMILAR FITTINGS: *F. J. T. Haskew.*—For screwing bends, &c., at the tube-ends at one time together, are furnished two running head-stocks set at the angle required upon beds which carry the bend or other work upon a holder which holds the work in its grips. The grips are disposed upon a carrier in the form of a capstan, that can be rotated, and an ordinary expanding screwing-die is mounted upon each of the two head-stocks.

MEETINGS.

FRIDAY, FEBRUARY 21.

Architectural Association Discussion Section.—Mr. F. C. Eden on "The Organ: Its Proper Position and Architectural Treatment." 7.30 p.m.

Royal Institution.—Mr. W. Duddell on "Musical and Talking Electric Arcs." 9 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. Priestley, B.A., on "Duties of Sanitary Inspectors: II.: Indoor." 8 p.m.

Institution of Mechanical Engineers.—Fifty-fifth Annual General Meeting, when the annual report of the Council will be presented to the meeting, and the results of the ballot for the annual election of the President, Vice-Presidents, and Members of Council will be announced. Subsequently, the meeting will be made "Special," for the consideration of a preposal to increase the number of ordinary Members of Council from fifteen to twenty-one, and to provide that seven instead of five Members of Council shall retire annually. The discussion on "Modern Machine Methods" will be concluded, and the author, Mr. H. F. L. Orcutt, will reply. If time permit, the following short papers on the "Fencing of Different Kinds of Machinery" will be presented, with a view to their being collectively discussed on Friday, March 21:—"Fencing of Steam and Gas Engines," by Mr. Henry D. Marshall; "Fencing or Guarding Machinery Used in Textile Factories," by Mr. Samuel R. Platt; "Protection of Lift-Shafts, and Safety Devices in Connexion with Lift-Doors and Controlling Gear," by Mr. Henry C. Walker; "Guarding Machine Tools," by Mr. W. H. Johnson.

Birmingham Architectural Association.—Paper by Mr. E. Wood.

Glasgow Architectural Craftsmen's Society.—Mr. T. S. Fraser on "The Renaissance of Scotland." 8 p.m.

SATURDAY, FEBRUARY 22.

Builders' Foremen and Clerks of Works' Institution.—Annual dinner, King's Hall, Holborn Restaurant. 6 p.m.

Royal Institution.—Rt. Hon. Lord Rayleigh on "Some Electrical Developments" (II.). 3 p.m.

Builders' Foremen's Association.—Paper by Mr. A. S. E. Ackermann, M.Inst C.E., entitled: "Some Engineering and other Observations in 1901, during a 5,000 miles Tour in the United States." 8.15 p.m.

Institution of Junior Engineers.—Visit to the New Baths and Washhouses of the Borough of Fulham, Melmotb-place. 3 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Lambeth Disinfecting Station, Wanless-road, Loughborough Junction. 3 p.m.

Edinburgh Architectural Association.—Visit to the North British Railway Co.'s Hotel at Waverley.

Dundee Institute of Architecture.—Visit to Dunfermline.

MONDAY, FEBRUARY 24.

Surveyors' Institution.—Mr. Rowland Berkeley on "Electric Railways and Street Compensations." 8 p.m.

London Master Builders' Association.—Dinner at the Empire Hall, Trocadero Restaurant, Piccadilly-circus, W. 6.30 p.m.

Society of Arts (Cantor Lectures).—Mr. Cyril Davenport, F.S.A., on "Personal Jewellery from Prehistoric Times"—III. 8 p.m.

TUESDAY, FEBRUARY 25.

Institution of Civil Engineers.—Further discussion on Messrs. W. M. Mordey and Bernard M. Jenkin's paper on "Electrical Traction on Railways." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. J. Priestley, B.A., on "Duties of a Sanitary Inspector"—III. Offensive Trades and Trade Nuisances, &c." 7 p.m.

Royal Victoria Hall (Waterloo-road, S.E.).—Mr. Barry Parker on "Beauty in Buildings and Some Things which Lead to it." 8.30 p.m.

WEDNESDAY, FEBRUARY 26.

Society of Arts—Professor Roberts Beaumont, M.I. Mech.E., on "Recent Inventions in Weaving Machinery. 8 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Soapworks.

City of London College Science Society.—Mr. E. A. Robins on "The Theory and Practice of Photographic Manufactures."

Devon and Exeter Architectural Society (Plymouth, Devonport, and Stonehouse Branch).—Address by Mr. Silvanus Trevail, F.R.I.B.A.

Northern Architectural Association.—Mr. Algernon P. B. Barker, B.A., on "Duties of Building Owners as to Sewers." 7.30 p.m.

Edinburgh Architectural Association.—Mr. W. G. Burn-Murdoch on "Historical Design proposed for the New Municipal Buildings," with limelight views. 8 p.m.

THURSDAY, FEBRUARY 27.

Carpenters' Hall, London Wall (Free Lectures on Matters connected with Building).—Mr. H. H. Statham on "The Architectural Treatment of Bridges." Mr. Aston Webb, A.R.A., will preside. 8 p.m.

Society of Arts (Indian Section).—Mr. Nilkanth B. Wagle, B.A., on "The Industrial Development of India." 4.30 p.m.

Leeds and Yorkshire Architectural Society.—Paper by Mr. W. Burton, F.C.S. 6.30 p.m.

Society for the Encouragement of the Fine Arts.—Conversazione at the Galleries of the Royal Institute of Painters, Piccadilly.

Institution of Electrical Engineers.—(1) Major-General C. E. Webber, C.B., R.E., Past President, on "Electric Shock and Legislation thereon." (2) Mr. F. B. Aspinall on "Electric Shocks." (3) Mr. A. P. Trotter on "Electric Shocks at 500 volts" (illustrated by a demonstration at 500 volts). 8 p.m.

FRIDAY, FEBRUARY 28.

Architectural Association Discussion Section.—Mr. T. H. Russell, M.A., on "Dartmoor Granite." 7.30 p.m.

Institution of Civil Engineers.—(Students' meeting). —Mr. A. M. Arter on "Indicating High-speed Steam-engines." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. A. Wellesley Harris on "Methods of Disinfection." 7 p.m.

Devon and Exeter Architectural Society.—Meeting at Exeter. Mr. A. S. Parker on "Building By-laws."

SATURDAY, MARCH 1.

Royal Institution.—Rt. Hon. Lord Rayleigh on "Some Electrical Developments"—III. 3 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Marylebone Stoneyard, Richmond-street, Edgware-road, W. 3 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 4.—By RENDELL & SYMONS (at Totnes).

Blacktawton, Devon.—Grimpstone Farm, 168 a. 1 r. 14 p., f. £3,100

February 6.—By H. FURZE & Co. (at Croydon).

Wallington.—1 and 2, Cranley-gardens, u.t. 95½ yrs., g.r. 10*l.* 10s., e.r. 74*l.* 695
Onslow-gardens, a freehold building site 125
Stanley-rd., four freehold building plots 100

By WM. HOUGHTON.

Walthamstow.—Hale End-rd., The Royal Oak, b.-h., with goodwill; also a cottage adjoining, f., p. 8,070

February 11.—By HUNTER & HUNTER.

Chelsea.—107, King's-rd., with wheelwright's premises, yard, &c., in rear, u.t. 39¾ yrs., g.r. 25*l.*, y.r. 90*l.* 1,010
South Kensington.—13, Ovington-gardens, u.t. 22½ yrs., g.r. 9*l.*, p. 950

By LEWIS ABRAHAMS (at Masons' Hall Tavern).

Haymarket.—Nos. 51 and 52, Kirk's Restaurant, u.t. 14 yrs., r. 525*l.*, with goodwill 1,575

February 12.—By H. DONALDSON & SON.

Dalston.—29, Colveston-cres., u.t. 54 yrs., g.r. 7*l.* 10s., y.r. 48*l.* 510
Stoke Newington.—14 and 16, Mildmay-rd., f., y.r. 70*l.* 1,145
Homerton.—5, 7, 9, 46, 48, and 50, Holmbrook-st., u.t. 20½ and 22 yrs., g.r. 13*l.* 10s., w.r. 120*l.* 18s. 520
Upper Holloway.—22, Chester-rd., u.t. 78 yrs., g.r. 6*l.*, e.r. 42*l.* 380

By THURGOOD & MARTIN.

Cranbrook, Kent.—High-st., four freehold cottages, w.r. 35*l.* 2s. 480

February 13.—By H. J. BLISS & SONS.

Hackney.—30, Downs Park-rd., u.t. 59 yrs., g.r. 6*l.*, e.r. 40*l.* 465
Bethnal Green.—128, Vallance-rd., u.t. 17 yrs., g r 5*l.*, w r. 33*l.* 16s. 100
4 and 7, Minto-pl., w.r. 62*l.* 8s., also i.g.r. 8*l.*, u.t. 17 yrs., g.r. 16*l.* 165

By ROGERS BROS.

Peckham.—62, Meeting House-lane (S), u.t. 80 yrs., g.r. 6*l.*, y.r. 32*l.* 250

By WESTON & SONS.

Forest Hill.—6, Derby-villas, u.t. 55 yrs., g.r. 5*l.* 15s., y.r. 30*l.* 270
Clapham.—26, 28, and 30, Larkhall-rise, f., w.r. 98*l.* 16s. 1,190
Wimbledon.—Dundonald-rd., f.g.r. 18*l.*, reversion in 86 yrs. 460
Dundonald-rd., f.g r. 10*l.*, reversion in 80 yrs.. 255
Newton-rd., f.g.r. 16*l.*, reversion in 75½ yrs..... 405
Benefit of a profit agreement entitling to moiety of net profits to arise from the Croham Hurst Building Estate, South Croydon, area 16 a., u.t. 99 yrs., g.r. 20*l.* per acre 1,300

By C. C. & T. MOORE.

Commercial-road East.—Nos. 436 and 438 (S), area 2,440 ft., f., y.r. 150*l.* 2,800
No. 655 (s), f y.r. 50*l.* 1,010
No. 657 (s), with off-licence, f., y.r. 55*l.* 1,400
No. 659, 661, 663, and 665 (s), y.r. 235*l.* 3,850
St. George's East.—Christian-st., four railway arches (Nos. 93 to 96), u.t. 939 yrs., g.r. nil, e.r. 125*l.* 1,560
Spitalfields.—7 and 9, Fournier-st. (s), f., y.r. 155*l.* 2,940
Aldgate.—41, Middlesex-st. (s), f., y.r. 80*l.* 2,000
67, Middlesex-st. (s), f., y.r. 90*l.* 2,000
Mile End.—84 to 94 (even), Rutland-st., u.t. 33 yrs., g.r. 33*l.*, w.r. 392*l.* 16s. 2,330
3, Clark-st., u.t. 33 yrs., g.r. 6*l.*, w r. 85*l.* 16s... 550
Limehouse.—22 to 30 (even), Grenade-st., building site, area 2,420 ft., f. 570
St. George's East.—154 and 155, St. George-st., and 38, Denmark-st., f., y.r. 127*l.* 12s. 1,8.0
Bow.—13, St. Stephen's-rd., u.t. 52 yrs., g.r. 4*l.*, y.r. 40*l.* 570
61 and 65, Lyal-rd., u.t. 47½ yrs., g.r. 8*l.*, w.r. 72*l.* 16s. 680
84 and 85, Lyal-rd., u.t. 47½ yrs., g.r. 8*l.*, w.r. 72*l.* 16s. 700

By STIMSON & SONS.

Pimlico.—312, Vauxhall Bridge-rd. (s.), f., e.r. 70*l.* 1,000
Walworth.—58, 60, 62 and 64, Barlow-st., u.t. 31 yrs , g.r. 23*l.*, w.r. 145*l.* 12s. 630
1, 3, 5 and 7, Tatum-st., u.t. 31 yrs., g.r. 29*l.*, w.r. 187*l.* 4s. 830
Harringay.—Umfreville-rd., f.g.r.'s. 26*l.*, reversion in 86 yrs. 680
Umfreville-rd., f.g.r.'s. 40*l.*, reversion in 87 yrs. 1,080
Tooting.—Devonshire-rd., a plot of building land, f. 225
Soho.—133, Wardour-st. (s), with workshop and stabling in rear, u.t. 8½ yrs., g.r. 90*l.*, y.r. 161*l.* 2s. 115
Battersea.—158 to 170 (even), New-rd. (s), u.t. 26½ yrs., g.r. 28*l.*, w.r. 200*l.* 4s. 750
Peckham.—Marmont-st., f.g.r.'s. 30*l.*, reversion in 50½ yrs. 815

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Sydenham.—Hillmore-grove, f.g.r. 27*l.* 10s., reversion in 89 yrs. £700
Forest Gate.—Pevensey-rd., f.g.r. 25*l.*, reversion in 98 yrs. 625
Finsbury Park.—106, Blackstock-rd. (S), u.t. 35 yrs., g.r. 6*l.*, y.r. 32*l.* 240
Stepney.—1 to 11, Black Bull-court, part f. and part u.t. 83 yrs., g.r. 22*l.*, w.r. 187*l.* 4s. 620
Hackney.—85, Morning-lane, u.t. 71½ yrs., g.r. 5*l.*, w.r. 44*l.* 4s. 215
118, Chalgrove-rd., u.t. 71½ yrs., g.r. 3*l.* 10s., w.r. 34*l.* 4s. 185
February 14.—By A. MARTIN NEWCOMBE.
Beckenham.—Mackenzie-rd., Lansdown Villa, f., e.r. 40*l.* 650
Penge.—41, Tennyson-rd., u.t. 73½ yrs., g.r. 4*l.*, w.r. 96*l.* 170

By PEACEY & FULLER.

Bayswater.—65, Artesian-rd., u.t. 44 yrs., g.r. 7*l.*, y.r. 40*l.* 370
32, Courtnell-st., u.t. 44 yrs., g.r. 6*l.* 6s., r. 40*l.*... 370

By TRIST & Co.

Clapham Common.—Balham Hill, Tregothnan, u.t. 65 yrs. g.r. 24*l.* 12s. 6d., y.r. 85*l.* 950

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 11 6	per 1,000 alongside, in river.
Rough Stocks and Grizzles.....	1 9 6	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 5 0	,, ,, ,,
Flettons	1 8 0	,, at railway depôt.
Red Wire Cuts ..	1 12 0	,, ,, ,,
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,, ,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,, ,,
Do., Bullnose	4 10 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 5 6	,, ,, ,,
GLAZED BRICKS		
Best White and Ivory Glazed Stretchers.....	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers .	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers..	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	14 0 0	,, ,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,, less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	32 0	per ton, delivered.
Best Ground Blue Lias Lime..	25 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. 0d. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 3	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks ..	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup)	2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld rly. depôt.
,, ,, ,, 3 in. do.	1 2½	,, ,,

PRICES CURRENT (*Continued*).

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	12 0 0	per 1000 of 1800 at ry. dep.
,, best seconds ,,	11 10 0	,, ,,
16×8 best ,,	6 15 0	,, ,,
20×10 best blue Portmadoc ..	11 5 0	,, ,,
16×8 best blue Portmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green....	12 2 6	,, ,,
16×8 ,, ,,	7 5 0	,, ,,
20×10 permanent green	10 5 0	,, ,,
16×8 ,, ,,	5 17 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles..41	6	per 1,000, at rly. depôt.
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	14 10 0	16 0 0	
Deals: best 3 by 9.....	13 10 0	15 0 0	
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in	10 10 0	11 10 0	
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.	
Deals: seconds	1 0 0	less than best	
Battens: seconds	0 10 0	,, ,, ,,	
2 in. by 4 in. and 2 in. by 6 in. .	8 10 0	9 10 0	
2 in. by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0 0	
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.	
½ in.	1 0 0	,,	
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Swedish balks.....	2 15 0	3 0 0	
Pitch-pine timber (30 ft.).....	3 0 0	3 10 0	

JOINERS' WOOD.

	At per standard.		
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0	
3 in. by 9 in.	20 0 0	21 0 0	
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0	
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0	
,, ,, 3 in. by 9 in.	16 10 0	18 10 0	
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0	
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0	
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0	
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0	
Do. 3 in. by 9 in.	17 0 0	18 0 0	
Battens.....	13 0 0	14 0 0	
Second yellow deals, 3 in. by 11 in.....	15 0 0	16 10 0	
Do. 3 in. by 9 in.	13 10 0	14 10 0	
Battens.....	11 0 0	12 0 0	
Third yellow deals, 3 in. by 11 in.....	12 10 0	13 10 0	
Do. 3 in. by 9 in.	12 0 0	13 0 0	
Battens.....	10 0 0	11 0 0	
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 0 0	15 0 0	
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0	
Battens.....	11 0 0	12 0 0	
Second white deals 3 in. by 11 in.	13 0 0	14 0 0	
,, ,, ,, 3 in. by 9 in.	12 0 0	13 0 0	
,, ,, ,, battens.....	9 10 0	10 10 0	
Pitch-pine: deals	16 0 0	18 0 0	
Under 2 in. thick extra	0 10 0	1 0 0	
Yellow Pine—First, regular sizes..	32 0 0	33 10 0	
Broads (12 in. and up).....	2 0 0	more.	
Oddments	22 0 0	24 0 0	
Seconds, regular sizes	24 10 0	26 10 0	
Yellow Pine Oddments	20 0 0	22 0 0	
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6	
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0	
Small ,, ,, ...	0 2 3	0 2 6	
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6	
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8	
½ in. do. do.	0 0 7	- - -	
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11	
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0	
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0	
Teak, per load	16 0 0	20 0 0	
American Whitewood Planks— Per ft. cube.....	0 3 0	0 3 6	
Prepared Flooring—	Per square.		
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6	
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6	
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0	
6 in. at 6d. per square less than 7 in.			
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6	
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6	
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6	
6 in. at 6d. per square less than 7 in.			

PRICES CURRENT (*Continued*).

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars.....	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars.....	9 0 0	9 10 0
Hoop Iron, basis price.....	9 5 0	9 15 0
,, ,, galvanised.....	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.....	10 0 0	- - -
,, ,, to 24 g.....	11 0 0	- - -
,, ,, to 26 g.....	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.....	14 0 0	- - -
Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g.....	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.....	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 10 0	10 0 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 5 0	- - -
Pipe in coils	14 15 0	- - -
Soil Pipe.....	17 5 0	- - -
ZINC—Sheet—		
Vieille Montagne..... ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet..... per lb.	0 1 0	- - -
Thin ..... ,,	0 1 1½	- - -
Copper nails..... ,,	0 1 1½	- - -
BRASS—		
Strong Sheet... ..... ,,	0 0 11	- - -
Thin ,, ... ,,	0 1 1	- - -
TIN—English Ingots..... ,,	0 1 3	- - -
SOLDER—Plumbers' ... .. ,,	0 0 6½	- - -
Tinmen's .... ,,	0 0 8	- - -
Blowpipe ..... ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths.....	3d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, fourths	4d. ,, ,,
32 oz. thirds	5¼d. ,, ,,
,, fourths	5d. ,, ,,
Fluted sheet, 15 oz.....	3d. ,, ,,
,, 21 ,, ...	4d. ,, ,,
⅛ Hartley's Rolled Plate	2d. ,, ,,
1/16 ,, ,, ,, ...	2¼d. ,, ,,
¼ ,, ,, ,, ...	2½d. ,, ,,

OILS, &c.

	£ s. d.	
Raw Linseed Oil in pipes.....	per gallon	0 2 0
,, ,, ,, in barrels	,,	0 2 10
,, ,, ,, in drums	,,	0 3 0
Boiled ,, ,, in pipes	,,	0 2 11
,, ,, ,, in barrels	,,	0 3 0
,, ,, ,, in drums	,,	0 3 2
Turpentine, in barrels	,,	0 2 6
,, in drums	,,	0 2 8
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	,,	20 10 0
Best Linseed Oil Putty	per cwt	0 8 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gal on £ s. d.
Fine Elastic Copal Varnish for outside work ..	0 16 6
Best Elastic Copal Varnish for outside work ..	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work.....	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work.....	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work....	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 16 0

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Laying-out Pleasure Ground	Aldershot U.D.C.	20*l.*, 10*l.* and 5*l.*	Mar. 1
*Proposed Public Offices	do.	100*l.*, 75*l.* and 50*l.*	Mar. 29
*New Market Hall	Market & Baths Com. Oldham Cpn	50*l.*, 30*l.*, and 20*l.*	April 8

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Broken Granite	Diss (Norfolk) U.D.C.	A. Cooper, Surveyor, The Retreat, Diss	Feb. 25
Granite Road Metal, &c.	Dover Town Council	W. Knocker, Town Hall, Dover	do.
Gritstone Setts (4,000 tons)	Droylsden (Lancs) U.D.C.	C. Hall, Engineer, Council Offices, Droylsden	do.
Three Cottages, Jury-street	Derby Corporation	W. Ward, Civil Engineer, Babington-lane, Derby	do.
Workmen's Dwellings, Ordnance-street	Devonport Town Council	Borough Surveyor, 20, Ker-street, Devonport	do
Office, Shankill-road, Belfast	Directors of the Ulster Bank, Ltd	W. H. Stephens & Son, Architects, Donegall-sq., North Belfast	do.
Car Shed, &c., Laird-street	Birkenhead Corporation	C. Brownridge, Civil Engineer, Town Hall, Birkenhead	do.
Sewerage Works, Minworth	Castle Bromwich R.D.C.	Willcox & Raikes, Engineers, 63, Temple-row, Birmingham	do.
Flints, &c. (700 tons)	Southampton Corporation	R. R. Linthorne, Municipal Offices, Southampton	do
Street Works, Albert-street and others	Stanley (Durham) U.D.C.	J. Routledge, Surveyor, Council Offices, Stanley	do.
Church, St. George-on-the-Lea, Darwen		B. V. Johnson, Architect, 20, Victoria-street, S.W.	do.
House, York-road, Killarney	Nottingham City Council	T. T. O'Connor, 60, High-street, Killarney	do
Refuse Destructor and Power Station, Eastcroft	Watford Union	A. Brown, Civil Engineer, Guildhall, Nottingham	do.
*Home for Nurses		C. P. Ayres, Architect, Burvale, Watford	do.
Offices, &c., Bank Foundry, Towerby Bridge, Yorks.	Mr. W. Cooper	W. C. Williams, Architect, 29, Southgate, Halifax	Feb. 26
Shop and House, High Spen, Durham	Manchester Corporation	G. T. Wilson, Architect, 121, Durham-road, Blackhill	do.
Three Bridges over Rochdale Canal		City Surveyor, Town Hall, Manchester	do.
Road Works, Erdington, near Birmingham	Audenshaw (Lancs) U.D.C.	H. H. Humphries, Engr., Public Hall, Erdington, nr. Birmingham	do.
Sewerage Works, Corporation-road	Messrs. Phillips & Sons	J. P. Wilkinson, Civil Engineer, 147, Arcade-chmbrs., Manchester	do.
Large Stables, Newport, Mon.	Litherland (Lancs) U.D.C.	Habershon & Co., Architects, 41, High-street, Newport	do
Kerbing, &c., Linacre-road	Leek (Staffs) U.D.C.	A. H. Carter, Surveyor, Sefton-road, Litherland	do.
Poultry Market	North Dublin R.D.C.	Town Surveyor, Council Offices, Leek	do.
Boundary Wall, Gate, &c.	Belper R.D.C.	J. O'Neill, Council Offices, North Brunswick-street, Dublin	do
Engine House, &c.	Brankesome (Dorset) U.D.C.	J. Frith, Engineer, Baslow, Belper	do.
Hospital, &c.	Barnet U.D.C.	S. J. Newman, Architect, Branksome, Parkstone	do
*Road Making and Paving Works	Hackney Borough Council	Council's Surveyor, 40, High-street, Barnet	do
*Annual Contracts	Canterbury Corporation	Council's Engineer, Town Hall, Hackney, N.E.	Feb. 27
Underground Convenience	Hastings Corporation	A. C. Turley, City Surveyor, Town Hall, Canterbury	do.
Boundary Walls, Drainage, &c., at Borough Cemetery	Oldbury U.D.C.	P. H. Palmer, Civil Engineer, Town Hall, Hastings	do.
Sewerage Works		J. T. Eayrs, Civil Engineer, 39, Corporation-street, Birmingham	do.
Two Blocks of Houses, Northowram	Maesteg School Board	Walsh & Nicholas, Architects, Museum Chambers, Halifax	do.
School Buildings, Blaenllynvi, Glam.	Hornsea U.D.C.	E. W. Burnett & Son, Architects, Tondu, near Bridgend	do
Shed and Stores	Ugborough (Devon) School Board	W. E. Warburton, Surveyor, Public Rooms, Hornsea, near Hull	do.
Drainage Works at Schools	Hackney Borough Council	A. Warren, Architect, Buckfastleigh	do.
*Cart Shed, Office and Mess Room, Clifden-road		Council's Engineer, Town Hall, Hackney	do
Bungalow, Rose Avenue, Elgin, N.B.		C. C. Doig, Architect, Elgin	Feb. 28
Bridge Works, Lochwinnoch, N.B.	Standing Joint Committee	P. D. Alexander, Civil Engineer, Dunmyat, Bridge of Weir	do.
Chapel and School, Sandbach Heath	Tadcaster R.D.C.	A. Price, Architect, Sandbach	do.
Magazine, Annitsford, Northampton		L. H. Armour, 16, West-street, Gateshead	do.
Renovating Church, Pallaghamcehan, Ireland	Clutton (Somerset) School Board	Rev. P. Brady, Rossinver, near Manorhamilton	do.
Additions, &c., Police Station, Mountain Ash, Glam		T. M. Franklen, County Offices, Cardiff	do
Surveyor's Materials	Llangollen U.D.C.	T. Scott, Surveyor, Aberford, near Leeds	do.
Cottage Hospital, Maryport	Mr. G. H. Wilmot	C. Eaglesfield, Architect, Maryport	do.
School and Residence		W. F. Bird, Architect, Midsomer Norton	do.
Improvements to Cottage, Pandy, Wales	Belfast Corporation	E. Foster, Architect, Bella Vista, Abergavenny	Mar. 1
Additions, &c., to Assembly Rooms		E. F. Jones, Council Offices, Llangollen	do
Theatre, Ashby-road, Loughborough	Hornsey U.D.C.	Barrowcliff & Allcock, Architects, Loughborough	do
Additions to Schools, Bowes, near Darlington	Slough (Bucks) U.D.C.	Rev. C. B. Wardle, The Vicarage, Bowes	do.
Library, Ballymacarratt	Northamptonshire County Council	Blackwood & Jury, Architects, 41, Donegall-place, Belfast	do.
Boundary Wall, St. John's Church, Fenwick-Cum-Mos		Rev. F. H. Allen, Moss Vicarage, Doncaster	Mar. 2
*Road and Sewer Works	Islington Council	Council's Engineer, Southwood-lane, Highgate, N.	Mar. 3
Sewerage Works	Tottenham U.D.C.	W. W. Cooper, Engineer, Mackenzie-street, Slough	do.
Rebuilding Whilton Bridge	Rugby U.D.C.	C. S. Morris, County Surveyor, County Hall, Northampton	do.
Three Shops & Offices, Glebeland-st., Merthyr Tydfil	Lewisham Borough Council	C. M. Davis, Architect, 112, High-street, Merthyr	do.
*Ten Dust Vans	Mountain Ash U.D.C.	Council's Engineer, Town Hall, Upper-street, N.	do.
*Annual Contracts	St. Pancras Borough Council	The Clerk, 712, High-road, Tottenham	Mar. 4
*Temporary Hospital	Fulham Borough Council	Council's Surveyor, Rugby	do.
*Annual Contracts	do.	Council's Surveyor, Town Hall, Catford	do.
Bridge Works, Penrhiwceiber	Isle of Wight R.D.C.	J. Williams, Surveyor, Town Hall, Mountain Ash	do
*Street Girder Work for Power Station	Halesowen R.D.C.	Electricity Department Offices, 57, Pratt-street, N.W.	do.
*Annual Contracts	South Shields Corporation	Town Clerk, Town Hall, Fulham, S.W.	Mar. 5
*Wood Paving and Cleft Oak Fence	Wandsworth & Clapham Union	Council's Surveyor, Town Hall, Fulham, S.W.	do
Water Supply Works, Chale	Metropolitan Boro' of Bermondsey	H. Eldridge Stretton, Council Offices, Ryde	do.
Street Works, Green-lane, Station-lane, &c.	Woolwich Council	W. Whitworth, Surv., Public Offices, Great Cornbow, Halesowen	do
Road Materials	do.	S. E. Burgess, Civil Engineer, Chapter-row, South Shields	do
*Receiving Wards, &c., at Infirmary	Bath U.S.A.	Lansdell & Hamson, Architects, 65, Basinghall-street, E.C.	do.
*Committee Rooms, &c., at Town Hall	Langport R.D.C.	R. J. Angel, Borough Surveyor, Town Hall, Spa-road, S.E.	Mar 6
*Restoration of St. James's Church, Hereford	Batley (Yorks) Town Council	Nicholson & Hartree, Architects, Hereford	do.
*Water Vans and Carts, and Tar Boiler	Metropolitan Borough of Stepney	Council's Engineer, Maxey-road, Plumstead	do.
*Steam Roller Shed, and Cart Shed	West Ham Council	do.	do
Surveyor's Materials	Commissioners of H.M. Works, &c	City Surveyor, Town Hall, Bath	Mar. 8
*Water Supply Works, Barrington	Bridport R.D.C.	Bailey-Denton, Son, Lawford & Symons, Engineers, 9, Bridge st	Mar. 10
Setts, Kerb, &c.	Liverpool Select Vestry	C. J. Kirby, Surveyor, Market-place, Batley	do
*Paving Jubilee-street and Turner-street	Newmarket Union	Borough Engineer, 15, Great Alie-street, Whitechapel, E.	do.
*Electric Generating Station and Offices	Cheshire County Asylum	Borough Engineer, Town Hall, West Ham, E.	Mar. 11
*Postal Sorting Office, Hull	Tewkesbury R.D.C.	H.M. Office of Works, Storey's Gate, S.W.	Mar. 12
Road Works	Kent County Asylum	J. W. T. Bartlett, Surveyor, 72, West Bay-road, Bridport	do.
*Buildings for Infirmary, Knotty Ash	York School Board	Kirby & Willink, Architects, 5, Cook-street, Liverpool	Mar. 17
*Extension of Union Workhouse		Holland & Sons, Architects, High-street, Newmarket	do
*Drainage Works		County Architect, Newgate-street, Chester	Mar. 22
*Laying Sewers and other Works	Mr. W. Pakeman	Council's Clerk, Tewkesbury	Mar. 24
New Cottages		W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	Mar. 26
*Two New Board Schools	Mr. C. O. Liddell	Demaine & Brierley, 13, Lendal, York	No date
House, Blaenannerch, Wales	Farnborough U.D.C.	R. Evans, Crynga Mawr, Wales	do.
Additions to College, Belfast	Gainsborough R.D.C.	J. J. Phillips & Son, 61, Royal-avenue, Belfast	do
Hotel, Totnes, Devon	The Rt. Hon. the Earl of Denbigh	Starkey, Knight & Ford, Limited, Paignton	do.
Alterations to two Houses, St. John's-street, Coventry	Abingdon R.D.C.	Harrison & Hattrell, Architects, 23, Hertford-street, Coventry	do.
Alterations to St. Stephen's Schools, Elton, Bury, Lanc.	Staines R.D.C.	D. Hardman, Architect, Agur-street, Bury	do.
Alterations to Shirenewton Hall, Chepstow	Colonel the Hon. W. Alexander	Newland & Co., Architects, 19, Commercial-street, Newport, Mon	do.
Stone Kerbing	Primitive Methodist Trustees	J. E. Haigreaves, Surveyor, Town Hall, Farnborough	do.
Road Metal (11,000 tons)	Mr. J. Daniel	R. Maxwell, Surveyor, Gainsborough	do
Sinking Well, Shimpling, near Bury St. Edmunds	Salford Corporation	H. Biddell, Playford, Ipswich	do.
Reservoir Embankment, Ysceifiog, near Mold	W. H. Newall, Esq.	T. B. Farrington, Civil Engineer, Trinity-square, Llandudno	do.
Broken Granite (7,000 tons)		B. & E. M. Challenor, 59, Stert-street, Abingdon	do.
Broken Granite		G. W. Manning, Surveyor, Council Offices, Staines	do.
Alterations to Church Farm, Sutton Veney, Wilts		H. F. Price, Architect, Weston-super-Mare	do.
Chapel, Hereford		W. W. Robinson, Architect, Hereford	do
Four Houses, Pontnewynydd, Wales		G. H. Daniel, Clarence Chambers, Pontypool	do.
Alterations to House, Drinkwater Park		H. Lord, Architect, 42, Deansgate, Manchester	do.
Two Cottages, Hamilton-road, Salisbury		J. Harding & Sons, Architects, Salisbury	do.
*Factory, Leyton, Essex			

[See also next page.

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PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Resident Engineer for New Sewerage Works	Stamford Corporation	4*l.* 4*s.* per week	Feb. 26
*Timekeeper	Metropolitan Boro' of Bermondsey	120*l.*	Mar. 3
*Assistants (Architect's Department)	London County Council	4*l.* 10*s.* per week (not exceeding)	do.
*Architectural Assistants (Architect's Department)	do.	do.	do.
*Sanitary Inspectors (2)	Hampstead Council	120*l* each	do.
*Clerks of Works (2)	Lewisham Borough Council	3*l.* 3*s.* per week each	Mar. 4
*Junior Building Surveyor	London County Council	2*l.* per week	do.
*Inspector of New Buildings and Drainage Work	Hornsey U.D.C.	160*l.*	Mar. 8

Those marked with an asterisk (*) are advertised in this Number. Competitions, *p.* iv. Contracts, *pp.* iv. vi. viii. x. xii. & xxiv. Public Appointments, xvi. & xxiv.

TO CORRESPONDENTS.

M. & F. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ACTON GREEN.—For making and sewering, including branch drains, Temple and Weston-roads on the Kingswood Park Estate, Acton Green, W. Mr. Edward Monson, architect and surveyor, Acton-vale, W., and 22, Buckingham-street, Adelphi, W.C.:—

Meston & Hale	£2,092	F. Smith	£1,568
Kavanagh & Co.	1,881	I. Macklin	1,550
T. Adams	1,835	H. Boyer	1,532
Felkin & Watson	1,828	R. Clarke	1,430
Killingback & Co.	1,702	R. W. Swaker	1,330
C Ford	1,689	W. H. Wheeler	1,307
H. Morecroft	1,678	A. C. Soan	1,280
Carpenter & Willis	1,665	Woodham & Sons, Catford, S.E.*	1,245
Nowell & Co.	1,636		
Wimpey & Co.	1,625		

BATLEY.—For extensions to schools, Hanover-street. Messrs. C. H. Marriott, Son, & Shaw, architects, Church-street Chambers, Dewsbury:—

Masonry.—J. Oldroyd, Batley *
Joinery.—W. H. Clegg, Dewsbury*
Slating.—W. H. Thompson, Batley*
Plumbing.—J. Walshaw, Batley*
Plastering.—Samuel Crawshaw, Batley*
Ironfounding.—Bagshaw & Sons, Batley*

} Estimated total cost of works, £2,800, including furnishings, &c., not included in these contracts.

BEESTON (Yorks).—For the erection of stables and two houses, Millshaw, for Mr. W. L. Ingle. Messrs. T. A. Buttery & S. B. Birds, architects, Queen-street, Morley:—

John Brayshaw, Studley-terrace, Leeds	£150 0 0
Joinery.—J. W. Binks & Sons, Morley	169 0 0
Plumbing.—A. Fawcett, Peel-street, Morley	25 10 0
Plastering.—E. Wilson, Morley	15 2 4
Slating.—J. W. Binks & Sons, Morley	42 0 0

CAMBRIDGE.—For erecting the Cambridge and County Boys' School, Hills-road. Messrs. A. P. MacAlister & E. J. Tench, architects, Cambridge:—

	With Terra-cotta Dressings.	With Stone Dressings.
J. Shillitoe & Son	£8,200	£8,130
S. Foster	7,850	7,723
J. P. White	7,777	7,654
A. J. Bateman	7,670	7,573
W. Sindall	7,642	7,500
W. Saint	7,624	7,498
W. Bell & Sons	7,324	7,397
The Oak Building Co	7,221	7,213
Willmott & Son	7,102	7,059
Gimson & Co.	7,099	7,044
H. J. Linzell	6,986	6,908
Kerridge & Shaw	6,892	6,924
Coulson & Lofts, Cambridge*	6,720	6,630

CORK.—For the erection of two pairs of semi-detached villas, Blackrock-road. Messrs. W. H. Hill & Son, architects, South Mall, Cork:—

J. A. O'Connell, Clarkes Bridge, Cork* .. £2,000

DARLINGTON.—For the erection of a pair of semi-detached cottages, Corporation Farm, for the Corporation. Mr. Thos. Smith, Borough Surveyor, Town Hall, Darlington. Quantities by Borough Surveyor:—

Excavating, Bricklaying, Stonemasonry, and Plastering Work.

Wm. Robinson, Barton, Darlington* £335 10 0

Carpentering and Joinery Work.

J. H. Stephenson, Darlington* £163 2 0

Slating Work.

Wharton Bros., Darlington* £53 10 10

Plumbing and Glazing Work.

Thomas Armitstead, Darlington* £52 0 0

Painting Work.

Wm. Hornby, Darlington* £12 6 8

DOWNDERRY (Cornwall).—For the erection of a villa residence, for Mr. H. W. Rook, of Plymouth. Mr. J. H. Vincent, architect, 74, Old Town-street, Plymouth. Quantities by architect:—

W. E. Blake	£1,019 0	W. Stephens	£783 16
R. & J. Andrew	935 0	A. E. Rickaby	768 4
J. H. Blackell & Son	925 0	A. Truscott, 19, Market-street, Stonehouse, Plymouth*	760 0
A. Andrews	880 0		
W. Gibson	810 0		

GWYRFAI (Carnarvon).—For the execution of waterworks, for the Rural District Council. Mr. E. Evans, C.E., 8, Castle-street, Carnarvon. Quantities by engineer:—

David Owen	£3,971 14 6	E. Ariel Chase	£2,466 12 3
Wm. Thomas	2,935 0 0	Robt. A. Crowe, Deansgate, Manchester*	2,389 16 4
Evan Jones	2,850 0 0		
Richard Jones	2,564 3 5		

HULL.—For the erection of cement kilns, offices, &c., Stoneferry, for Messrs. Burstall & Co., Ltd. Messrs. Gelder & Kitchen, architects, 76, Lowgate, Hull:—

Geo. Jackson & Sons, Wittsans, Hull* £1,126 3 8

LEEDS.—For the erection of a police-station and library, Harrogate-road and Town-street, Chapeltown, for the Corporation. Mr. W. H. Thorp, architect, 61, Albion-street, Leeds. Quantities by the architect:—

Masonry and Bricklaying.—J. Richardson Chapeltown*	£1,670 0 0
Carpentry and Joinery.—Banks Mawson, Sheepscar, Leeds*	1,295 0 0
Plumbing and Glazing.—Bedford & Son, Chapeltown*	836 17 0
Ironfounding.—Dixon Powner, Hartley Hill, Leeds*	463 14 6
Slating.—J. Season, Hunslet-road, Leeds*	146 0 0
Plastering.—T. Moore, Concord-street, Leeds*	433 0 0
Painting.—Jenkins, Tollerton, & Co., Merrion-street, Leeds*	101 0 0
Electrical Engineer.—Dixon & Son, Boar-lane, Leeds*	198 0 0
	£8,203 11 6

LONDON.—For extensions to electric light station, Coronet-street, for the Shoreditch Borough Council. Mr. J. Rush Dixon, C.E., Town Hall, Old-street, E.C.:—

Johnson & Sons	£3,454	Chas. Ansell	£2,250
Pollard & Brand	2,700	H. L. Holloway	2,230
H. B. Neal	2,554	Gardner & Hazell	2,216
Chessum & Sons	2,497	Yates & Co.	2,199
W. Reason	2,399	Spencer, Santo, & Co., Ltd.	2,152
Kiddle & Sons	2,385	Wilson Bros. & Lamplough, Notting Hill, W.*	2,069
W. H. T. Kelland	2,347		
F. G. Minter	2,312		
Smith & Son, Ltd.	2,279		
A. Porter	2,251		

[Borough Surveyor's estimate, £2,300.]

LONDON.—For alterations and additions to the Victoria House, Burdett-road, for Mr. F. Baker. Mr. J. M. H. Gladwell, architect, Boston House, 63 and 64, New Broad-street, E.C.:—

W. J. Maddison	£524	A. E. Symes*	£498
Cocks, Ltd.	498		

LONDON.—For the erection of a warehouse on the south-east quay of the Limehouse Basin, for the Regent's Canal and Dock Co. Plans and quantities by Messrs. Thomas & Thomas, Paddington:—

Patman & Fotheringham	£7,183	Sheffield Bros.	£6,495
Bull & Esdaile	7,000	Johnson & Co.	6,473
Johnson & Sons	6,962	Kirk & Randall	6,443
Godson & Sons	6,924	W. Gladding	6,388
Chessum & Co.	6,700	Holliday, Greenwood, & Co.	6,387
Perry & Co.	6,659	Lovatt & Co.	6,340
J. C. Richards	6,633	Watts, Johnson, & Co.*	6,157
J. R. Ward	6,526		

MARPLE.—For the erection of National School buildings. Messrs. Jas. Hunt & Son, architects, 4, Warren-street, Stockport:—

Neil & Son	£2,500 0	J. Briggs	£2,220 0
Partington & Son	2,500 0	Daniel Edie	2,178 0
James Pott	2,342 0	M. Lane	2,150 0
Broadhurst & Co.	2,300 0	Robinson & Sons, Hyde*	2,119 0
Jos. Broadhurst	2,290 10		

NOTTINGHAM.—For the erection of a pair of semi-detached villas, Sherwood Rise. Messrs. Cellyer & Slater, architects, 8, Bridlesmith-gate, Nottingham. Quantities by architects:—

A. B. Clarke	£1,200	A. T. Key	£1,033
Hutchinson & Son	1,150	W. Appleby	1,020
T. Cuthbert	1,140	W. Maule	1,015
S. Parnell	1,120	T. Whittaker, Traffic-street*	1,010
G. T. Lovett	1,100		
T. Long	1,050		

[All of Nottingham.]

[Plumbing, electric lighting, and painting to be let separately.]

STAMFORD.—For sewerage work. Mr. J. B. Everard, M.Inst.C.E., Leicester:—

Contract No. 1.

Nowell & Son	£9[illegible],144 2 4
J. Mackay	59,911 3 0
T. Phillrick	55,620 0 0
J. Jackson	53,955 6 5
J. H. Vickers, Ltd.	51,111 4 6
C. Chamberlain	49,556 3 3
H. Ashley	47,953 0 0
G Osenton	47,363 5 11
J. T. Binns	45,265 2 11
H. Tyson	44,942 15 0
G. Bell	44,658 0 0
F. Barlow	44,457 7 0
W. G. Willmott	44,[illegible]8 0 0
Johnson & Langley	4[illegible],609 9 0
Jones & Son	41,223 0 0
Perkins, Craig, & Co.	41,[illegible]00 6 0
Moss & Sons	40,66[illegible] 0 0
J. Dickson	40,055 0 0
Cooke & Co.	39,5[illegible]6 0 0
Braithwaite & Co.	39,668 0 0
G. F. Tomlinson	37,590 0 0
Wilkinson Bros.	35,552 0 0
F. N Simpson	34,487 16 4
J. S. Dawson	34,466 11 3
Bentley & Sock	34,131 14 0

Contract No. 2.

Bax & Dawson	£2,507 13 7	Bowman & Son	£1,595 10 0
J. Jackson	2,194 4 9	Riddett & Son	1,587 0 0
W. & M. Hawkes	1,740 17 0	J. Wcolston	1,407 0 0
Moss & Sons	1,726 9 0	T. W. Rowe	1,471 13 6
F. D. Goodwin	1,638 19 6	Hinson & Co.	1,450 19 6
C. Chamberlain	1,600 10 0		

TEIGNMOUTH.—For alterations at Wilts and Dorset Bank. Messrs. Bridgman & Bridgman architects, Torquay and Paignton. Quantities by Mr. Vincent Cattermole Brown, Paignton:—

Fredk. C. Francis	£1,630
Hugh Mills, Newton Abbot*	1,500

[Architects' estimate, £1,550.]

[*See also next page.*

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WEST HAM.—For the erection of a block of school buildings and appurtenances, to be known as the Holborn-road Schools, Canning Town, E., for the West Ham School Board, under the direction of Mr. W. Jacques, 2, Fen-court, Fenchurch-street, E.C., Architect to the Board. Quantities by Messrs. R. L. Curtis & Sons:—

B. E. Nightingale	£32,345	W. Gladding	£29,269
A. E. Symes	31,293	W. J. Maddison	28,995
Battley, Sons, & Holness	29,416	G. Sharpe	28,744
Stimpson & Co.	29,286	Gregar & Son	28,100
		A. Reed‡	27,976

‡ Accepted, subject to the approval of Board of Education.

LONDON SCHOOL BOARD TENDERS.

AT the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect:—

* *Recommended for acceptance.*

FURNITURE STORES (Clerkenwell).—Purchase and clearing away of old metal and wood, on a running contract:—

	Metal. Per cwt.	Wood. Per cubic yard.
	s. d.	s. d.
J. Ashton	1 6½	1 4½
Bird & Co.	1 0	—
J. Kelley	0 9⅝	4 6
A. Learoyd, jun.	1 4	—
Longman & Son	1 7	—
J. A. Richardson	†1 3	3 0
Worms & Son*	1 7½	5 3

† This price is for wrought and cast iron. The contractor also quotes 3d. per cwt. for light iron, scuttles, &c.

GREENWICH (LUCAS-STREET).—Improvements: Providing new halls, 50 ft. by 28 ft., for all departments; new staircases for boys' and girls'; new additional cloak-rooms for all departments; re-dividing and re-stepping and providing additional lighting to existing classrooms for all departments; providing new water-closets and covered playgrounds for all departments; providing new drainage scheme; enclosing, draining, and tar-paving the additional land; new heating scheme by low-pressure hot-water appliances. Revised accommodation: Boys', 318; girls', 318; infants', 318—total, 954. Net loss, 68 places:—

F. & H. F. Higgs	£15,247	J. & M. Patrick	£13,306
W. Downs	14,797	J. & C. Bowyer	13,286
Wallis & Sons	14,234	C. Cox	13,149
Holliday & Greenwood, Ltd.	14,030	Kirk & Randall	12,834
Garrett & Son	13,663	Smith & Sons, Ltd.	12,597
Lawrance & Sons	13,570	Stimpson & Co.*	12,400

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Wenham & Waters, Ltd.	1 7
Robert Clarke	1 5½
The Brightside Foundry and Engineering Co., Ltd.	1 4½
Kinnell & Co., Ltd.	1 4
Unsigned	1 3½
Hayward Bros. & Eckstein, Ltd.	1 0½!

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Thonet Bros.	,,	3 6
Schoolbred & Co.	,,	3 4½
G. J. Levy	,,	2 10½

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	Each.		Each.
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Fisher, Son, & Weaver	1 14 0	R. H. Galbraith	1 2 9
North of England School Furnishing Co., Ltd.	1 7 6	Wrinch & Sons	1 1 0
		H. Bouneau*	0 19 8

IRONING STOVES (Gas):—

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Summerscales & Sons, Ltd.	9 9	Fletcher, Russell, & Co., Ltd. (less 30 per cent.)*	9 9

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LXXXII.—No. 3082. MARCH 1, 1902.

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Syrian Building.

THE difference between the methods of building and construction adopted in Asia and in Europe is perhaps as great as anything else which distinguishes these two great divisions of humanity one from the other. Both in Asia and in Europe the art of building is carried on at the present day with traditions of the past; the mason builds his walls, the carpenter cuts his wood, much in the same way as his forefathers of untold centuries ago; and these primary elements in construction have only slightly been modified by the introduction in recent times of certain economic expedients, chiefly in ironwork. It is curious to find that such expedients, originating in Europe, have been adopted to their fullest extent by the conservative Asiatic, but always in such a manner as to involve a non-European character.

Climatic, and to some extent geological differences also naturally enter into the question. Racial distinctions probably originate in these very facts, and, consequently, the manners and customs of mankind, and above all the primary art of building.

The art of building has always been associated and identified with the religion of the builders. Asiatic building may be divided into two great general divisions surviving at the present day—the style of the Mohammedan races, and the style of the immeasurably greater branch of the Buddhists. The present article, in continuation of a preceding sketch of modern Beyrout, will be confined to a study of the Mohammedan style as practised in Syria and the Nearer East at the present time. On this fringe of Asia, European influences and the immense number of Europeans of all sorts actually resident in the shore towns seem to have very little apparent effect as far as the buildings are concerned. Even the innumerable modern houses and convents built expressly for Europeans in Jerusalem, Haifa, Beyrout, and other places are all, without exception, constructed on Asiatic principles, and the builders are invariably Mohammedans.

When a man proposes to build himself a house in any Levantine country, he first of all surrounds the plot of land selected with as high a wall as he can afford. This is partly with the object of keeping off trespassers, but still more for the purpose of securing his always somewhat vague title to the property. The title deeds (*cushans*) are always so much matters of dispute and intrigue amongst contentious neighbours, assisted by the local officials, that the shortest way out of the difficulty is found to be by securing the confines of the property at once, before anything else is done. In this wall there is but one gate, usually flanked by a hut for the guardian. The plan of the house is then drawn on the ground, usually exactly in the centre of the plot, without any regard to a garden or to the surroundings. As has already been explained, in speaking of Beyrout, the plan of a Levantine house is always absolutely the same, without the smallest variation to suggest the rank or occupation of the owner. The trenches for foundations are dug with a sufficient accuracy, usually down to the rock, and are filled up with large stones packed together with mud mortar. In places where it is possible a well is sunk, but in many districts, such as Palestine, dependence has to be placed upon cisterns for water supply, and indeed cisterns may be considered the more usual method all over the East. These cisterns, often of enormous proportions, are lined with a peculiar cement composed of lime, wood-ashes, and powdered potsherds. The position of the cistern is one of the few things in planning a house where circumstances may occasionally necessitate a slight variation from the received model. The custom is that the cistern should be placed immediately underneath the great central chamber or *lewan* and in places where it has to be excavated in the rock, the stone thus obtained is used in building the house above it. A typical plan of a Levantine house has already been given in describing the modern town of Beyrout.

The Syrian littoral from Alexandretta to Port Said consists of a sandstone formation bordering the sea, with a limestone hinterland. The sandstone is the better of the two for building, the mountain limestone being too hard and consequently expensive for really satisfactory masonry. In both districts lime is very difficult to procure, and terribly expensive on account of the scarcity of fuel for the kilns. But the worst feature about building in the inland districts is the absence of all sand. This most necessary of all ingredients in the mortar is supplemented by a black earth, which is merely a vegetable mould. On the coast, where sand is, of course, abundant, the lime must be brought from a long distance inland on camels.

Many modern houses are now built in Jerusalem and Beyrout with the iron joist and concrete filling-in of the European style, the chief difference noticeable being a much rougher and ruder application of the system. Frequently the concrete of stones and mud-mortar refuses to stay between the joists, and the work has to be tried over again. In every case such a system with such unsuitable materials is very defective and often dangerous. Setting aside this modern innovation of iron and concrete, the old and characteristic vaulted construction is much more interesting to study.

The walls of a Syrian house are always of the substantial thickness of at least 3 ft., both outside and for divisions between rooms. This prodigious thickness is due in the first place to the large size of the stones employed, each one of which is as large as a man can lift. They are about an average of 1 ft. 6 in. by 1 ft. 3 in. by 10 in., and of the most unsatisfactory shape possible from the point of view of good masonry. Broken out of the quarry in a rough wedge, one face is selected for trimming down to a square or parallelogram to show on the face of the wall; the remainder of the stone is left of a wedge or tapering form to be fitted into the thickness of the wall with little stones and mud. All the stones are, in fact, mere "shiners," to use a vulgar expression; outwardly they present the appearance of

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regular coursed masonry of a particularly solid character, but the wall in reality is little more than a mass of mud, lime, and little stones. That such a construction should last any length of time at all is very surprising, but when one discovers that the buildings of the Crusaders, erected in a precisely similar manner, are still *en évidence*, the fact becomes still more surprising.

The marvellously dry climate of Syria sufficiently accounts for the survival of such a mode of construction for hundreds of years. In Europe such buildings would subside into mere heaps after a single winter's rain and frost. During a Syrian winter the rainfall may be almost the same as in some European countries, but the rain comes down almost in waterspouts, fills the cisterns, and within a few hours the atmosphere has regained its normal dryness. Under these condisions a mud wall will endure for ages, more especially when it is protected by a sort of stone sheathing.

Another and equally important reason for the use of such very substantial walls in Syria is the universal adoption of domical vaultings, which, with their solid "pockets," are of immense weight. Wood floors are absolutely unknown in the East, although tiled roofs are common enough, and every house of more than one story must necessarily be vaulted in its lower floors. These vaultings are constructed in a pecular and very primitive manner. Our illustrations show an ordinary one-roomed house or cottage, such as the labouring classes build, in course of erection. The largest eastern house of a Pasha or Bey is merely a collection of such primitive constructions arranged round a central hall. In fig. 1 the walls are shown carried up to the height where the curious mud vaulting is started. Fig. 2 shows the arrangement of the mould or "form" on which the vaulting is eventually constructed. This "form" is made of branches of trees supported from below with struts, and covered over with a neat coating of mud to the lines which it is intended the dome should take. It is needless to say the fashioning of this mould with wet mud, following the traditional outlines and curves in relation to the space and dimensions to be covered, is considered a very special art in itself, and is confided to some old man whose venerable appearance inspires confidence. Plans, diagrams, or calculations as to weight or thrust of arches do not, of course, enter into the question; such aids to a natural style of architecture never have been used at any time in the East. Mohammedans build with a kind of instinct much as beavers do, and their only guide in such matters is the more or less valuable or costly fruit of experience.

The mould of the vault having been prepared, as shown in fig. 2, the building of the vault is carried out with rough stones of the lightest variety of sandstone or limestone procurable, bonded together as well as the builder knows how with his strongest variety of mortar. Sometimes a rib of squared and jointed stones is inserted, showing on the under face of the vault, but this is a mere decoration to relieve the plastering and suggest a strength of construction which has no reality.

It will be noticed in our illustrations that the haunches of the vault are left unfinished externally until the vaulting is completed; this is in order that the stonework of the exterior may be bonded together with the internal construction and tie in the spring of the vault as much as may be possible (fig. 1).

Fig. 1.

The vaulting and external walls being completed to a general level and the "pockets" or haunches filled in, the whole is covered with layer of limestone mud, called "hawa," which is found in the bottoms of watercourses amongst the mountains. The work is then allowed to settle and dry for more than a year before the limestone mud is removed and the top covered with its finished floor or roof of stone slabs or "balats." The interior is then plastered with a mixture of lime, ground up limestone, and chopped straw, the floor is paved with stone or the modern cement tiles, the windows and door are fitted with the usual flimsy woodwork of the Levant, and the house is considered fit for habitation. The construction of the largest house, or assemblage of such rooms, proceeds in precisely the same way. (Fig. 3.)

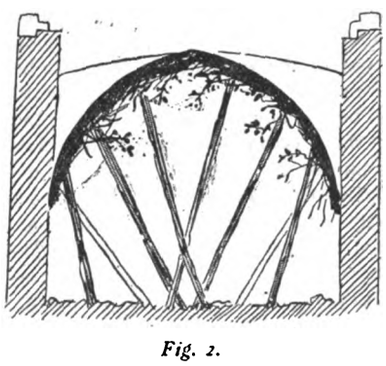

Fig. 2.

Eastern masonry owes its flimsiness in a great measure to the difficulty and cost of working the stone. The soft calcareous limestone of Europe is rarely found at the Eastern end of the Mediterranean, and almost the only monuments with properly squared masonry cut from the hard mountain limestone date from the days of the mighty Romans. Here in striking contrast with the most stupendous of built monuments of the greatest master-masons the world has ever seen, we find in modern days the most unsubstantial and unscientific of architectural styles.

Eastern carpentry is, it possible, even more flimsy and unsubstantial than the masonry. One or two peculiarities of construction are worthy of notice, but these peculiarities chiefly excite wonder at the possibility of such a style being at all lasting. In describing Beyrout reference was made to the enormous roofs of red tiles which cover the great square modern houses. These roofs are, of course, all constructed on one system, which is sufficiently represented in fig. 4. The object in view is to economise wood to the very utmost on account of its great cost. The square space has to be covered somehow, and the cheapest method (perhaps dearest in the end) hitherto discovered is that represented in the diagram. This system probably originated at a time when timber was even more difficult to obtain than it is in our days. The principle of a strutted principal rafter without a tie beam is a very scientific one, and if carried out with a sufficiency of timber, and without too great a demand upon the possibilities of 10 in. by 4 in. rafters, is a very satisfactory one. But the Levantine builders naturally carry things to an extreme in this expensive department of construction, and, apparently satisfied with an almost temporary makeshift to endure for a few decades, they run up a truss, often of spliced timber, which depends on bolts, and even nails, for its solidity. This framing is covered with very widely spaced purlins and common rafters, on which the laths for the "French" tiles are laid. These so-called "French" tiles, which are made in prodigious quantities on the Riviera coast—chiefly at Leghorn and Genoa—are distributed at all the Levantine ports, and the trade to the East, one of the most important of late years, has very much modified the appearance of Eastern towns and cities. "French" tiles are the most unsatisfactory of roof coverings; they are very light, and so admit of such a rubbishing timber construction. They are merely tied on to the laths underneath with wire, and, as a consequence, they are constantly being blown off in winter gales. To repair them is most difficult, owing to the variety of manufactures which are always succeeding each other at the different stores. It will readily be understood that ordinary house roofs in the Levant are continually being repaired and strengthened in patchwork, blundering ways, and the expense of endeavouring to keep them watertight is a very severe tax upon the householder.

Fig. 5 represents a very common type of upper story to a Jerusalem house, with its characteristic roof supported on uprights standing on the inner angles of the four chambers. In this case the *lewan*, of a cross-shape, is often divided in a temporary manner with glazed partitions or curtains into such additional rooms as may suit the convenience of the family.

Apropos of the subject of roofing, it may be of interest to observe that an apparently almost ancient roof of the strutted-principal construction exists over the Basilica of Bethlehem (fig. 6). This was probably put up in the early part of the nineteenth century, replacing a similar one of much more ancient times. Here the mode of construction may be studied to particular advantage, as there is no ceiling to intercept the view. The circular part of the Church of the Holy Sepulchre in Jerusalem during the Middle Ages was covered with an enormous wooden roof, to which many references are made in pilgrims' accounts of the Holy City; and of it there are a few very inadequate representations in old copper-plates of the seventeenth and eighteenth centuries. The span of this roof—about 80 ft. in diameter—was enormous

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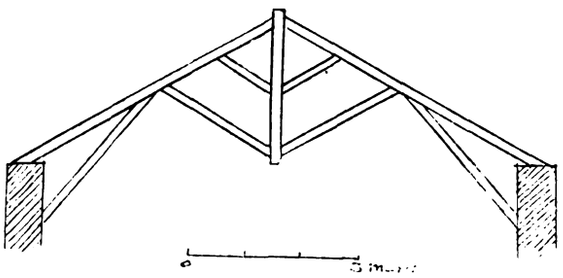

Fig. 4.

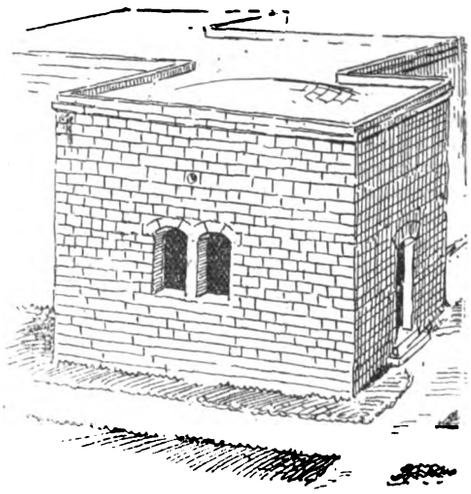

Fig. 3.

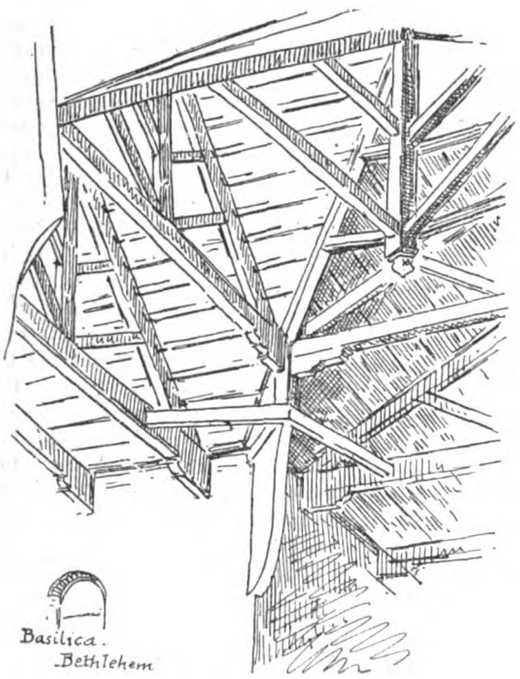

Fig. 6.

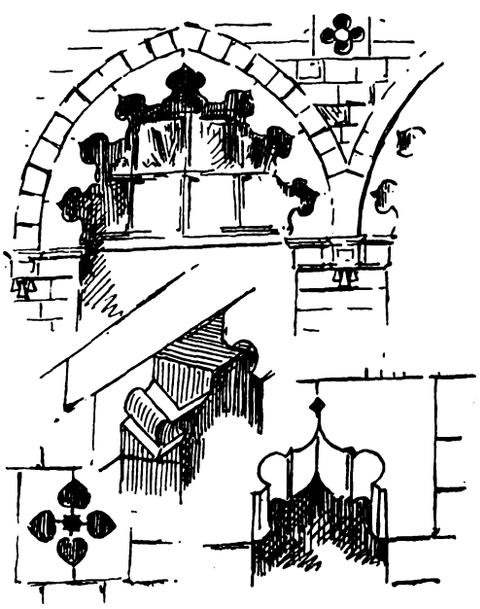

Fig. 7.

under the circumstances. It seems to have been constructed with a large central opening admitting light, rain, and air, on the principle of the Pantheon at Rome. It must, of course, have been designed on some system of trussed or strutted principals, although the inside appearance, to judge from the old representations, presented a surface of simple inclined rafters meeting at the circular curb of the central opening, in a manner which would have been simple, but hardly practical. The construction of this most interesting roof is unfortunately a mystery which can hardly be solved at the present day. It was completely destroyed by the great fire of 1808, which occasioned the rebuilding of the church as it now stands, and even since then the masonry dome, which seems to have replaced it, has again been rebuilt by the Russians with iron trussed girders and a lead covering. Another great roof of wood covering a circular plan is the Dome of the Rock in Jerusalem. This is externally and internally spherical in form, whilst the mediæval covering to the Holy Sepulchre appears to have been a straight-lined truncated cone. The Dome of the Rock is doubtless of ancient construction, but during the nineteenth century it has been subjected to much repair and "restoration." As it is inaccessible and the soffit is covered up with a plaster ceiling, there are no means of discovering how it is constructed. There is no doubt, however, that it is supported by an elaborate system of trussed rafters. The timber used in these old constructions is said to be of cypress, brought in former days from Caramania.

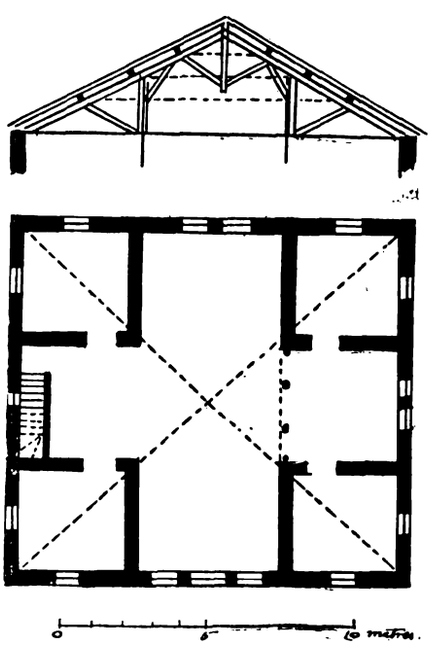

Fig 5.

There is very little more to mention about the art of building in this country, where monumental art has now sunk to the lowest ebb, and where the modern influences of government and social institutions apparently tend to render it less possible than even in former days. As has been shown, cheapness, flimsiness, and instability are the chief characteristics of all work done in the Levant, although large proportions are generally aimed at, and there are curious differences in style from anything European. It is needless to refer to the fittings of such buildings; they are always of a kind which would not pass muster in a cowhouse in England. Ventilation is, however, secured to an otherwise very insanitary interior by a general absence of fit in the doors and windows, and by their occasionally blowing in on a stormy night, even in the best of houses.

A few decorative details peculiar to Levantine architecture are worthy of notice. The great central hall, or *lewan*, of a house is always provided with an enormous window of three divisions, which forms the chief feature of the façade, opening on to a balcony. This great window is always constructed with elegant pointed arches resting on two of the most slender of marble columns possible. The capitals of these columns are usually of the "Doric" or "Corinthian" orders, but sometimes a more natural Sara-

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cenic type, with "pigeon-hole" ornament, is used. The arches are sometimes elaborately cut into foliations. The effect of these windows is generally pleasing, and would remind one, but for a much greater scale in proportions and a general flimsiness, of those in the characteristic mediæval Palazzo of Venice, to which they bear so close a family resemblance as almost to suggest an actual connexion. In addition to these great windows or loggia arcades, the fronts are often decorated with foliated piercings in the walls, usually circular; these are arranged over the windows to give additional ventilation. At first sight many of these foliated decorations, combined with pointed arches, irresistibly remind the European of the mediæval styles of Western Europe, but such an illusion is quickly dissipated by considering the utter difference existing between the two hemispheres of the art world. In the East there is nothing organic in the style, if such it can be called, of the architecture; but all kinds of ornament have, of course, a distinguishing character which makes itself felt under any circumstances. And this ornamental character, which has always a certain childishness and barbarism about it in the East, is fully represented wherever any decorative attempts are made. For instance, the foliations referred to above have all the Eastern simplicity of design; they are mere fanciful outlines of black shadow on a white wall; they convey no sense of intricate cusp or intersecting moulding; in fact, they have not the smallest connexion with the regular styles of European art in reality. Characteristic forms of windows and air holes are given in fig. 7.

A few words may be added as to the modern builders of the nearer East. A very few words indeed are needed to describe a class of humanity which is as unlike the elaborately organised "building trade" of the West as can possibly be imagined. In the Levant "professionalism" is practically an unknown quality in any rank of life, and there is hardly any conception of a "workmanlike" character about any one connected with any particular trade. The man who is handling the trowel or the mason's tools this week may have been occupied in mending shoes or at a baker's oven last week, and he may turn his hand to something equally various next week. At certain seasons of the year building is quite impossible, because the builders are attending to the more pressing claims of the harvest, or the duties of the militia, or—still more important—the religious exercises of the month of "Ramadan." A very few individuals, hardly worth counting, in Beyrout or Jerusalem, have of late years invested capital in plant and stores, and may, perhaps, be considered as "builders," in the meaning of that term in the West, but elsewhere the "trade" and the "art" of building are practised in a very primitive and "natural" manner. Building is looked upon as a very poor way of earning a living, and men take to it when no other work of a more congenial kind offers. A few old "sheiks" have a reputation for building domical vaults, which, perhaps, gives them a certain professional character.

Payment of labour is by the day, varying from the equivalent value of 6d. upwards, carpenters and joiners getting as much as the equivalent of 3s. sometimes. In addition to regular wages the men have an inducement to stay on a job, and even expedite the work, by the custom of a feast taking place at the completion of each domical vault, when a roast sheep with bowls of rice is provided by the employer, and is calculated as part of the cost of the building. In this happy land trade disputes are, of course, unknown, wages vary according to circumstances, and contracts have an elastic character. A general mode of estimating is at the rate of 40 napoleons per room of an average size, 16 ft. by 16 ft.; this is the usual square covered by the domical vault. The cost of a building is calculated by the number of squares of 16 ft. by 16 ft. which it covers, and there is no difference between the ground and first floors. Although so rough and uncivilised, the cost of building in the East is very much in excess of a better type in Europe.

In the East, scaffoldings are never made use of for masonry, the walls, being invariably of the great thickness of 3 ft., are sufficient for the workmen to stand upon and handle the stones; the ground floor is also always finished before the next story is commenced, and the materials are carried up inclined planes of thick planks instead of ladders.

There is, of course, no employers' liability law; accidents are constantly taking place amongst such undisciplined, ignorant people, but the unfortunate sufferers must take their risk. The European employer or superintendent finds the Asiatic working man easy to get on with, if he is treated as he expects to be, and with a certain *bonhommie*. He is very ready to acknowledge the superiority of European ideas, but as to practising what he professes to approve, that is quite another thing, and he very soon succeeds in convincing the European of the hopelessness of altering the customary methods of building—at least in Turkey.

NOTES.

The Housing Question in Glasgow.

MR. BALFOUR'S public approval of the appointment of a Commission to consider the housing question in Glasgow is interesting as showing that the attention of politicians is given to this question, in spite of other avocations. It is certain that in order to deal with this subject in different localities local needs and characteristics must be considered. For example, water communication at Glasgow is easy and cheap, and an extensive building of workmen's dwellings down the Clyde might help to solve the problem in that particular town. We do not for a moment offer this as a solution; we merely state it to indicate the difference in local conditions. As we have often said, the housing problem is very complex; there is no royal road to its solution, and we must be content to utilise each opportunity as it occurs. Thus, while too great hopes should not be aroused by the appointment of the Glasgow Commission, it may result in the production of useful data, and may give indications of the needs of this great town. Unfortunately, many of the conditions of the problem arise from circumstances external to the housing question, as Mr. Rowntree's valuable investigation into the condition of the working classes at York has recently shown.

Clay *versus* Gravel Sites for Houses.

THE current number of the *Journal of Balneology and Climatology* contains an interesting paper by Dr. S. D. Clippingdale on "The Clay and Gravel Soils of London, and the Relative Advantages of Dwelling upon Them." The author calls attention to the widely spread belief that it is better to live upon a gravel than upon a clay soil, and he essays to show that such belief is probably a fallacy. The paper tells us nothing much that is new, except, perhaps, some statistics relating to mortality, which, however, are culled for the most part from official returns, and the bulk of these are old. It is to be regretted that the author has not given us an epitome of what had previously been done in this particular branch of research, or at least have been more copious in mentioning the work of his predecessors. For instance, he arrives at the conclusion that, in estimating the relative advantages of dwelling in London on clay or on gravel soil, the statistics he gives are in favour not of gravel, but of clay. Years ago Mr. G. J. Symons remarked that "a house on a clay soil is not necessarily more unhealthy than one on gravel." More recently Mr. H. B. Woodward (1897), in an official geological memoir on "Soils and Subsoils," says that, in considering the respective merits of clay and gravel, it must be remembered that gravel may hold water, and that on a thin bed of gravel resting on clay the amount so held may be large. Where the foundations of a house have been carried down to the clay, the excavation required for them forms a sort of tank, into which water may, and often does, accumulate from the surrounding gravel. Long before Mr. Woodward's memoir was written we had frequently expressed the same opinions in the columns of this journal. We do not, however, entirely agree with Dr. Clippingdale that clay is *per se* better than gravel, even when efficient damp-courses are provided for the houses. The statistics given refer only to mortality, and the author himself laments the absence of statistics referring to certain complaints and diseases—such as rheumatism. Such diseases do kill sometimes, but the individual attacked usually suffers for many years before yielding much to their effects, and just as often dies of complications usually referred to senility. Another of Dr. Clippingdale's conclusions is that it is more important to attend to elevation above river level than to soil in erecting a house in the London district. We quite agree with him, and he might have found the same opinion expressed in Mr. Woodward's work referred to—"Hence elevation and situation have come to be of more importance than the original soil." As a matter of fact, every site must be chosen on its merits, though it certainly would take much to persuade us to select a site where a thin stratum of gravel rested on clay, even on a sloping surface.

Commons and Footpaths in Kent and Surrey.

THE Report of the Kent and Surrey Committee of the Commons and Footpaths Preservation Society for 1900-1 shows a great deal of extremely good work done. Its business is twofold: to look after commons and help the local authorities in regard to them, and to assist in the preservation of footpaths. Among the work which has been done in regard to commons is the completion of the effort for the preservation of Ham Common,

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the application for a scheme for its regulation under the Metropolitan Commons Act of 1866 having now been sanctioned by the Board of Agriculture; thus another of the open spaces near London is permanently preserved to the public. Attempts are also being made to obtain a scheme for the regulation of Horsell Common, but this has not yet been sanctioned. With regard to the work in protecting rights of way, it is to be noted that in many respects this Committee is really Conservative, and in the landlords' interest. A body which understands legal rights does not attempt to preserve assumed rights of way, but only those which there is clear evidence belongs to the public; thus the landlord is protected from those popular and injudicious attempts which are sometimes made to assert rights of way where they do not exist. The Committee point out the desirability of local authorities keeping all stiles, gates, and other means of passage on footpaths in a good state of repair. We should like to see this power indicated to them by a circular from the Local Government Board, but failing such official circular, societies such as this can do a great deal.

The Lorain Tramway System.

THE first mile of double track of the Wolverhampton Corporation Tramways has now been constructed, and the trial trips of the cars have successfully taken place. The system used is the Lorain surface contact, which has been developed in America, and there are no overhead wires at all. Practically the only difference between the appearance of the line and that of a horse tramway is that there are metal studs at distances of every few yards between the rails. The current is collected from these studs, which are only "alive" when the car is over them, by means of a contact bar under the car, and, after passing through the motors, is returned by the wheels to the rails in the usual manner. The method of making the stud alive is very ingenious. The centre part of each stud is made of manganese steel, which is practically non-magnetic and exceedingly hard, the outer parts are of cast iron and are burned on to the steel. Underneath the car are two long iron bars, which are magnetised with opposite polarities and are each about one inch above the cast-iron portions of the stud. An iron keeper in the box underneath the stud is consequently attracted upwards, and brings two carbon plates in contact, one of which is attached to the high pressure main and the other with the stud and thence through the phosphor bronze bar with the motors. When the car passes over the stud the magnetic circuit is broken and the keeper falls and disconnects the stud from the main. On the successful completion of a thirty-day trial of this mile of track the other eleven miles will be completed. A very valuable feature of this system is that a depth of only 9 in. is required to instal it. We think that difficulties may arise from the magnets underneath the car collecting nails, sheet iron cuttings, &c., from the streets, and that possibly during very wet weather the very large leakage currents may cause the circuit breakers to act and cut off power from the cars. However, the experiments now proceeding will soon settle these points, and we hope to be able to congratulate Wolverhampton on having an economical system of electric tramways without disfiguring overhead wires.

Sanitary State of Prestwich.

DR. THEODORE THOMSON'S report to the Local Government Board on the recent prevalence of diphtheria in the Prestwich Urban District notifies the existence of the class of sanitary defects usually met with in these cases. The report as to the structural condition of the houses (mostly cottages) is better than usual, although there are many courts and yards which are badly paved or entirely unpaved. It is in regard to refuse and excrement disposal and removal that the real complaint, as usual, crops up. Save for a small proportion of houses fitted with water-closets and dry ash-pits, refuse and excrement in the Prestwich district are disposed of by privy-middens, which are usually "capacious, deep, and offensive. They are cleansed by the Local Authority about five or six times a year, and the contents are, as usual in this method, shovelled from the privy-pit to the surface of the ground and thence transferred to a cart. The process is offensive and necessarily entails fouling of the street or yard surface. The mixture of refuse and excrement is then carted off to a 'tip,' where it is deposited and covered over with a thin layer of earth. The chief 'tip' in the district is situated in close proximity to the northern end of Rooden-lane village, and residents in its neighbourhood complain of it as an offensive nuisance." Except as regards houses constructed under recently-framed by-laws for new buildings, house-drains are not, for the most part, efficiently disconnected from sewers. But Dr. Thomson thinks there is great slackness on the part of the Local Authorities, and warns them that they should take steps to prevent the backing-up of sewage in the sewers liable to this occurrence; that measures are called for at Simister-lane to abate the nuisances now created there by accumulations of sewage in ditches and fields; and that every opportunity should be taken of securing efficient disconnexion of house-drains from sewers.

The Price of Incandescent Mantles.

SOME interesting statements with regard to the cost of mantles for incandescent gas lighting have recently been made at public meetings by leading gas engineers. Mr. H. E. Jones has stated that he has been offered, and has bought, incandescent burners of good quality (including mantles, chimneys, rods, and burners) for 8d. apiece complete, and it is stated that the South Metropolitan Company is using in South London mantles of good quality bought at lower rates than those charged by the Welsbach Company. Mr. Livesey has proposed that, if it be lawful, the gas companies should raise a guarantee fund to ensure that the validity of the Welsbach 1893 patent may be fairly contested, and the question finally settled one way or the other in the proper court. Mr. Livesey has rightly pointed out that if the existing condition of the mantle market is to remain unchanged until 1907, when the patent expires, gas will be severely handicapped in its competition with other illuminating agents. It has been suggested that gas manufacturers might themselves manufacture mantles, and as the making of mantles is an extremely simple process, we see no reason why the largest companies should not do so, and supply them at cost price to their customers, provided that such action be legal. If it be illegal at the present moment, we believe that Mr. Livesey could readily persuade Parliament to pass a Bill conveying the required powers. There can be no doubt that gas consumers would be greatly benefited thereby, and the sale of mantles at less than half their present price would render the supply of cheaper gas more feasible, since these mantles yield fully as much light with cheap low-quality gas as with expensive high-grade gas provided that the low-quality gas be of suitable composition. Several gas companies have already promised to subscribe to the guarantee fund, and it is expected that the test case, so long deferred, will come on for hearing during the present month.

University College Hospital, Gower-street.

IN the course of building operations for the erection of the new hospital have been found the foundation-stone, with an inscribed brass plate, and a list, dated May 20, 1833, of officials of the hospital and the University of London, which relate to the establishment of the hospital in Lord Brougham's time. The buildings, now being replaced, were begun in that year; the north wing, 1846, was built after Alfred Ainger's plans and designs. On June 21, 1898, his present Majesty laid the first stone of the new hospital which is being erected by means of Sir J. Blundell's gift to the extent of 100,000*l*. The plans and designs for 290 beds, by Mr. Alfred Waterhouse, are illustrated in the *Builder* of October 17, 1896, and described in our columns of June 25, 1898.

Water Colours by Mr. W. L. Wyllie.

MESSRS. DOWDESWELL have on view at their galleries in New Bond-street a collection of seventy-four small water-colour drawings, under the title, "On Many Waters," by Mr. W. L. Wyllie, one of the few marine artists of the day who can paint shipping as well as he paints sea. Some of these are purely sea paintings; "A Breeze in the Bay" (24), perhaps the best of all, rather looks as if it had been a study for the artist's principal Royal Academy picture of last year. Of the same type is "Lat. 47 deg. N., Long. 8 deg. W." (13); and near each is hung, as if in intentional contrast, a study of a coast sea of the dirty green tone not infrequently seen near the coast, though we cannot think that it has exactly been hit in "Shakspeare's Cliff" (23), which hardly looks real as a representation of sea-water, except in the fine way in which the surf is indicated. Sea-water is, however, as changeable in colour as Proteus in shape, and this effect may be true; but during much time spent at the seaside we have never seen it. There is a great deal of effect and interest in these little pictures; great interest of character and colour evolved from the mere representation of steamers and other craft moored in harbour; several views of Medway barges racing, full of life and movement; a few inland mountain scenes in the Highlands, very true to the character of the scenery; and one oil-painting with the interesting subject, "Total Eclipse of the Sun"—and men-of-war's men making photographs

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of it for a certain eminent astronomer who is said to have

> "Thought himself owner
> Of half the corona"—

a curious study of a special effect of lighting not often attempted in painting. Altogether an exhibition of artistic value and variety quite out of proportion to the small scale of the pictures.

Leighton and Millais.

A CORRESPONDENT of the *Times*, who signs himself "A Friend of Both," draws attention, in words with which we entirely sympathise, to the apparent disparity between the sepulchral honours paid to the two artists. Leighton has a sumptuous monument in a most prominent position in the nave of St. Paul's, while the grave of Millais, whom he rightly calls "the greatest artist of the Victorian era," is recognisable only by an inconspicuous slab on the floor of the ill-lighted crypt. It appears that a monument to Millais is in course of preparation, but it is not to be in St. Paul's Cathedral, where there is "no space," though there is space for a very prominent monument to Leighton; so that the criticism is not without point. Millais was unquestionably the greater artist of the two, as posterity at all events will recognise. Perhaps we may find the explanation in the fact that there was something ornamental, so to speak, about Leighton's whole personality and career, which somewhat took hold of the public fancy in a way that Millais' less showy and simpler character did not. Whatever the cause, the discrepancy between the outward honours paid to the two artists is remarkable, and we are glad that attention has been called to it.

LETTER FROM PARIS.

PARIS has been celebrating the centenary of Victor Hugo's birth, and the programme included the inauguration of the monument erected by public subscription on a site near the poet's former residence. The sculptor, M. Ernest Barrias, has represented Hugo at a time when he was in the maturity of his genius, at the age of fifty or thereabouts, as he is represented in the portraits made at Guernsey during the first years of his exile, with clean-shaved face and long hair. The figure is seated, the head leaning on the left hand, on a rock by the waves, among which the "Pieuvre," the somewhat extravagant cuttle-fish of the "Travailleurs de la Mer," twists its tentacles. Four figures symbolising the Four Winds of the Spirit are grouped around the central figure, while on the right of the pedestal is Dramatic Poetry holding a mask, and on the left Lyric Poetry offering the poet a lyre. Behind him is Fame blowing a trumpet above a trophy of arms and flags. At her side is seated a figure representing Satire, and pointing to the author of "Les Châtiments." The whole composition is very decorative in effect, and the bronze figures contrast finely with the rough granite surface representing the rocks. The pedestal is further decorated by fine bas-reliefs in bronze modelled by M. Allar and M. Barrias. M. Allar represents in one composition the poet at the tribune in Parliament, and in the other his reception on Parnassus by Hesiod, Homer, Dante, Shakspeare, Rousseau, and Voltaire. M. Barrias represents in one of his panels a scene from the "Châtiments"—

> "L'enfant avait reçu deux balles dans la tête"—

and on the other Victor Hugo as a novelist, surrounded by characters from "Notre Dame," "Les Misérables," "Les Travailleurs," &c.

M. Denys Puech, in his marble bas-relief which has been placed on the façade of the Comédie Française, has represented Victor Hugo at the same period of life as in M. Barrias' monument. Three other medallions, which will complete the set, represent Corneille, Molière, and Racine.

At its meeting of the 17th last, the Paris Municipal Council passed the law relative to the construction of the seventh line of Metropolitan Railway in Paris. This line, connecting the Palais Royal to the Place du Danube, will be nearly five miles long, with thirteen stations, and will pass by the Place de l'Opéra to the Boulevard de la Villette and the exterior boulevards. Its estimated cost is 800,000*l.*

The very important work of the new survey of Paris has just been completed under the direction of M. Bouvard, director of the architectural service of Paris, and M. Taxil, the surveyor. The statistics show a total number of 76,586 lots of landed and building property at Paris, occupying a surface of 14,035 acres, composed of 74,025 private buildings, occupying a surface of 10,393 acres; public monuments to the number of 1,007, occupying a surface of 3,392 acres; and private streets and roads to a number of 1,554, occupying a surface of 250 acres.

It is probable that the modified plan submitted by M. Bouvard, architect to the City of Paris, for the arrangement of the Champ de Mars, will be accepted by the Municipality and the State. The new scheme provides for two lines of fine houses the whole length of the Champ de Mars on either side, from the Seine to the Ecole Militaire. The central portion will be formed into an avenue 765 ft. wide, leading from the Eiffel Tower to the Ecole Militaire. This avenue will be the finest in Paris, the Avenue du Bois-de-Boulogne being only just half this width, or 400 ft. The sale of the ground proposed to be built over, a surface of 28 acres, will bring in about 1,120,000*l.* to the State and Municipality. The usefulness of such an avenue is, however, much debated, for, unlike the Avenue du Bois-de-Boulogne, which is much frequented, the proposed avenue, leading to or from no particular centre of attraction, will be nearly always comparatively deserted.

The miserable state of the buildings and installation of the celebrated manufactory and museum of the Gobelins at Paris is a subject of much comment; the present buildings, erected as temporary quarters in 1878, and since remaining, are so damp as to seriously threaten the preservation of the tapestries exhibited therein. A large piece of vacant ground exists on the avenue in front of the Gobelins, and M. Guiffroy, the director of the manufactory, is asking for a credit sufficient to allow the construction of a building for forming a museum more worthy of the magnificent collection of tapestries.

The inauguration of the new Salle Rothschild at the Louvre Museum took place on February 24, under the auspices of the Minister of Public Instruction and Fine Arts. This new room, which contains the numerous treasures of art left to the Louvre by the late Baron Adolphe de Rothschild, is situated above the landing of the Assyrian Museum, and close to the room containing objects of Musulman art. The ceiling of the new room is decorated with sculptured and gilt wood panels of the style of the end of the fifteenth century, the walls are covered with walnut panels in Italian style, the floor is formed of marqueterie. The aspect of the room is somewhat severe, and recalls in a manner some of the large rooms in the palaces of the Doges of Venice. The wall at the end of the room is covered by a magnificent Flemish tapestry of the end of the fifteenth century, with tissue of silk and gold representing the miracle of the multiplication of bread and fishes. The subject was necessarily a religious one, for the whole collection is composed of religious objects. Amongst some of the objects of the collection are:—A marble bas relief by Agostino di Duccio, representing the Virgin and the Child; several wood statues of the Saints and the Virgin Mary of Champenois, and German work of the commencement of the sixteenth century; a number of Spanish reliquaries of the sixteenth century; rosaries of the richest materials from various countries; religious statuettes and bas relief in ivory and precious stones; a sculptured gold cross of the fifteenth century which once formed portion of the treasure of St. Denis, added to the collection by Mme. de Rothschild. The public was also enabled to examine the new Salles de Dessins recently installed at the Louvre.

The new church of St. Jean de Montmartre, now under construction, is still exciting considerable interest on account of the curious state of affairs regarding the building rights. It is known that the Prefect of the Seine had notified the Vicar of Montmartre that he must demolish the nave of his church because it had been constructed without proper authority from the Prefect. By counsel's advice the Vicar asked the permission of the Prefect to construct the proposed tower of the new church, with the result, of a refusal from the Prefect. Appeal against this decision was made to the Minister of the Interior, who, by the intermediary of M. Bouvard, has granted the permission refused by the Prefect. It results, therefore, that the Vicar is authorised to construct a tower on the nave, the demolition of which is exacted by the Prefect. As, however, the refusal of the Prefect is simply on account of the non-compliance with the building laws, which exact that all buildings should be submitted in plan to the Prefect before their construction, and not by reason of the system of construction of reinforced cement (which in the report of the Minister of the Interior was declared to have given sufficient proofs to leave no doubt as to its strength and stability), the refusal of the Prefect as regards the nave will now be withdrawn.

Mr. Formigé is commencing the decoration of the Esplanade des Invalides, now entirely cleared of the last remnants of the Exhibition. The work will be followed up by MM. Bouvard and Vacherot, and the whole Esplanade will probably be decorated by a fine garden à la Française, with statues and decorative work generally in the style of the seventeenth century, to harmonise as much as possible with the palace built by Mansard, the Hôtel des Invalides.

A credit of 320,000*l.* has been voted for the proposed additions and modifications to the Palais de Justice at Paris. The work will be carried out by MM. Daumet and Ulmann, architects; a large number of very old and picturesque buildings now surrounding the Palace will be demolished. Old Paris is gradually disappearing, and this work will destroy another of the well-known picturesque and interesting corners of Paris, despite all the protests made by the Commission du Vieux Paris.

The Senate has now ratified the new law lately voted by Parliament, entitled "A Law for the Protection of Public Health." This law will only come into force in a year's time, and will thus allow the various Sanitary Councils of the towns and departments of France to prepare the way for the proper execution of the law, and draw up sanitary rules and regulations, which are much needed at Paris and in the provinces, and pave the way for better sanitation.

No offers having been obtained at the recent auction of the ground of part of the old Marché du Temple, probably by reason of the price asked being considered too high, 175,000*l.* or 20*l.* per square metre, it has been decided to demolish the old buildings and cut up the ground into several allotments to facilitate the sale.

It has been decided to restore the Pont d'Iéna. This bridge was constructed in 1808-14 by Lamande, by the order of Napoleon, to celebrate his victory of Iena. In 1815 Blucher wished to blow up this bridge, as a piece of revenge, and was with difficulty prevented from carrying out this piece of vandalism.

The tender of 350*l.* for demolishing the Cirque des Champs Élysées has been accepted by the Municipality. The building must be demolished within two months, the present foundations will not be touched below the depth of one metre, so as to allow for their use in the case of some new construction on this site.

The work of constructing the new Cour des Comptes in the Rue Cambon, near the Madeleine, is rapidly advancing under the direction of the architect, M. Moyaux. All the stone employed in this construction comes from the quarries of Coutarnoux, in the Yonne Departement, quarries opened under Louis XIV., and destined by Napoleon I. for the construction of the palace of the King of Rome, which he proposed to erect on the site now occupied by the Trocadero. The fall of the Empire hindered the intentions of Napoleon, and most of the alreadv prepared stone was employed by Viollet-le-Duc for the restoration of the cathedrals of Sens and Auxerre, and now by M. Moyaux for the construction of the Cour des Comptes.

A competition has been opened between architects, students, and draughtsmen, for the construction of an institute destined to provide lodging, food, and clothing gratuitously to 200

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students of both sexes. The competition is organised by a Parisian doctor, M. Sylvestre, and prizes of a gold medal and 20*l.*, a silver medal and 12*l.*, and a bronze medal and 8*l.* will be awarded to the authors of the first three chosen schemes respectively. The establishment is to consist of a very large hall to be used as a library and studio, with an arrangement of movable partitions to form small private studios to permit of quiet work; a large refectory, also divided by movable partitions; and separate sleeping-rooms for each student. The whole is to be as simple as possible, but is to be arranged with every modern comfort.

The new Hospital Marguerite Renaudin at Sceaux, founded by M. Renaudin, and constructed by M. Lequeux, architect, has just been inaugurated by M. de Selves, the Prefect of the Department.

The Government has decided that the new buildings of the Imprimerie Nationale shall be erected in the Rue de la Convention, in the Javel quarter of Paris, and voted a law to that effect after much discussion.

The Société des Amis des Monuments Parisiens has appointed M. Charles Normand, architect, as perpetual president in recognition of his many successful efforts in aiding the Société to carry out its objects.

The annual competition Godebœuf at the Ecole des Beaux Arts, the subject for which was a decorative newel and balustrade in marble and metal for a monumental staircase, was won by M. Wielhorski. The Rougevin competition was awarded to M. Herlofson, pupil of M. Scellier de Gisors.

The Commission de Vieux Paris is petitioning for the protection of three old and picturesque houses situated in the Rue d'Hauteteuille, one of which was inhabited by the mother of Cardinal Richelieu. These houses are menaced by the proposed widening of the street.

Much has been heard recently of the unfortunate disputes between the Government, which owns the Grand Palais de l'Art, and Société des Artistes Français; it was even said that the very existence of this year's Salon was endangered. It seems to be, in fact, a case of much ado about nothing—a question of financing which has nothing to do with art; but the Société des Artistes Français is considered to be hardly well-advised in assuming that its existence is necessary to the interests of art. If the Salon were closed, art would go on all the same; indeed, various illustrious French artists of recent days have pursued their career while avoiding all exhibitions, and many of those now working among us keep themselves aloof from all these disputes and take no interest in them. The Committee of the Old Salon might indeed take a lesson from their experience in the year 1900, when they persisted in holding their exhibition in rivalry with the great Exhibition, and only succeeded in getting together a collection of little value and which scarcely any one visited.

The committee charged to select and collect the works that are to form the nucleus of the permanent art exhibition in the Petit Palais, have already fixed on about 150 pictures scattered about the Hotel de Ville and the Magasins at Auteuil. Among them may be mentioned the curious landscapes of Hubert Robert; the "Naissance de la Vierge" of Restout; a splendid painting by M. Bonnat—"St. Vincent de Paul delivrant les galériens"; the "Saint Bruno" of M. J. P. Laurens; the "Eglogue" which procured M. Henner the medal of honour of the Salon; the "Sieste" and portrait of Proudhon by Courbet; a whole series of pictures by M. Roll; landscapes by Sisley, Cazin, and Guillemet; the "Prise de la Bastile" by Delaroche; the Bailly of Léon Cogniet; various works by de Neuville, Duez, and M. Gérôme; the portrait of Talleyrand by Prudhon; and the celebrated portrait of Mme. Récamier by Gérard. The Committee intends to continue its investigations in various municipal buildings, especially in the Musée Galliera, where the drawings of Puvis de Chavannes have been temporarily stored. Numerous also are the marbles and bronzes intended for the future museum: the "St. George" and the "Héraut d'Armes" of M. Frémiet; the "Premières Funérailles" of M. Barrias; the beautiful "Gloria Victis" of M. Mercié, and the bas-relief modelled by M. Dalou, "À la Gloire de la République."

The exhibition period is now in full swing. The "Union des Femmes Peintres et Sculpteurs" has occupied the Grand Palais with an exhibition not much better than usual. Then has followed the exhibition of "Peintres Orientales," where we may notice the works of the late Marius Perret, who died last year in the course of a Government mission in the Far East. The "Aquarellistes" have opened their annual exhibition, this time in the Georges Petit Gallery, where M. Vibert continues to show studies of Cardinals, and where there are collected some works of remarkable ability, among them a "Retour de la Charge" by M. Detaille, a work of singular conception and remarkably minute finish of detail. As a contrast, we may visit the collection of the works of Sisley at the Durand Ruel Gallery, and those of M. Monet and M. Pissarro at the Bernheim Gallery. At the Sisley exhibition we have landscapes painted at Moret and on the banks of the Seine and the Loing. The execution of this artist, at first light and delicate, became in his later period heavy and coarse, but always preserving a certain expressive power. M. Monet is entirely preoccupied by the study of the play of light, and gives various representations of the same scene or the same building under different effects of light. Some years ago he produced a set of drawings of the carved porch of a cathedral seen under different lights at different hours of the day; a work curious but forced in effect. With M. Pissarro we are in the heart of Impressionism; but he is always interesting, and his recent views of Paris and Dieppe are bright and delicate in effect.

At a moment when France is entering on the period of elections, it is significant to note that the Deputies have taken the initiative in endeavouring to prevent the disfigurement of important buildings by the usual flood of election placards. A law recently voted empowers the local authorities, for the future, to prevent the affixing of such placards on any buildings possessed of architectural character.

The formation is announced of a society for encouraging instruction in religious art. Among its supporters are M. Benouville, the architect; M. Didron, artist in stained glass; M. Albert Maignan, the painter; MM. Roty and Chaplain, the two eminent medallists, and M. Olivier Merson, the well-known decorative artist. The object of this society is to give to ecclesiastics an education in art which is to render them more capable of acting in harmony with the diocesan architects in regard to the treatment and decoration of the buildings under their care. It is hoped that one result will be to put an end to the taste for the kind of ecclesiastical sculpture produced and sold in the St. Sulpice quarter, specimens of which are to be found even in the finest religious buildings of France, side by side with masterpieces of mediæval and Renaissance art.

M. Marcellin Desboutin, the engraver and etcher, has died at Nice at the age of seventy-nine. He entered at the age of twenty-four the atelier of Couture, but subsequently went to Italy for twenty years, returning to France at the end of that time to exhibit at the annual Salons many works of exceptional merit, especially the portrait of Père Hyacinthe Loyson, and his own portrait, now at the Luxembourg, and known under the title "L'homme à la Pipe." He executed a great many fine works in dry-paint, and also etched the portraits of M. Zola, Manet, Henri Rochefort, Edmond de Goncourt, and Puvis de Chavannes, of whom he was a faithful and devoted friend, in spite of the curious contrast between the mystical and essentially aristocratic painter, and the absolutely Bohemian character and habits of the etcher. The attachment, however, was mutual, and Puvis de Chavannes held Desboutin in the highest honour, both as man and artist.

ARCHITECTURAL ASSOCIATION SPRING VISITS.—In the report of the visit to the Royal College of Science, in our last issue, a comma too much made it appear that all ironwork had to be excluded from the building. It should have read, "all ironwork which would have a disturbing effect on the delicate instruments" &c., with no comma after "ironwork."

CLUB BUILDINGS, SHEPSHED, LEICESTERSHIRE.—A new Liberal club was recently opened by Sir Henry Campbell-Bannerman at Shepshed. Externally the building is faced with red sand stocks and roofed with Broseley tiles. Over the main entrance is a balcony. In the gable above will be a modelled plaster panel bearing the name of the club. The plans of the club were prepared by Messrs. Barrowcliff & Allcock, architects, of Loughborough, and the building has been carried out under their supervision by Messrs. Atkins Bros., of Shepshed. The contract was for 1,760*l.*

THE SURVEYORS' INSTITUTION:

ELECTRIC RAILWAYS AND STREET COMPENSATION.

ON Monday evening last a meeting of the Surveyors' Institution was held at No. 12, Great George-street, S.W., the President, Sir John Rolleston, M.P., presiding for a short time, after which the Lord Chief Justice presided. The minutes having been taken as read, and some donations to the Library and Library Fund announced, a paper on "Electric Railways and Street Compensation" was read by Mr. Rowland Berkeley, Barrister-at-Law.

The author first dealt with the right of the public to pass and repass along the highways. The proper conclusion, in his opinion, as to the right of the public was that the public right was nothing more than a right to pass and repass; and consequently there was no title to compensation in them. As to the right of the Local Authorities, their right was a proprietary right to the surface of the highway; and together with the surface, such proprietary right below the surface as was essential to the maintenance and occupation, and exclusive possession of the highway, and the making and maintaining it for the use of the public, so long, and only so long, as the highway was and remained a highway. As to the rights of the owner, the author treated of the right to compensation under each of these heads—first, as to the value of the land taken; secondly, as to damage by severance; thirdly, as to compensation for damage by otherwise injuriously affecting other lands held nigh the lands taken. As to the first point, he said:—

"It will be remembered that both the public and the local authority have rights over and in the *highway soil*—rights that very materially affect the value of the subsoil of the highway; since to the extent of the existence of the public rights the owner has lost the right of an unlimited owner in respect of that soil; he cannot appropriate it, or deal with it by breaking it open, or use it in any way inconsistent with the rights of public user. Conceivably he could make a cellar there; even this within the London district could only be done with the consent of the local authority; and at the depth at which these railways are made, for practical purposes, the making of cellars or the carrying out of any other building operation beneath the highway need not be considered. Confining, then, our attention to London, there are no effective mining rights beneath the highway, and the chance of the land ever becoming valuable to the owner from its situation is beyond the bounds of reasonable probability. The soil beneath the highway, at the depth of which I am speaking, we may then confidently assume to be practically valueless to the owner. A value, it is true, may attach from its special adaptability for the making of a railway through it, supposing such soil to belong wholly to one owner or very substantially so. In London, however, the happening of such a condition of things is highly improbable, and may be disregarded. In assessing compensation under this heading, for the value of land taken, the guiding principle is that the value is neither its market value, nor yet its value to the promotors when they have acquired it, but its actual value to the person from whom it is taken. The question for determination is what is it worth to the owner; and that value is what he is entitled to be paid for it. Stebbing *v.* The Metropolitan Board of Works establishes this. The restrictive rights in that case were not the same as the restrictive rights over the soil of the highway, neither was the land taken for private purposes of profit. A churchyard was taken for the purpose of forming a new street. The plaintiff contended that service of the notice to treat, under the compulsory powers, freed the land from all restrictions and it thereupon became free land; while the defendants objected that the compensation payable was for the land with all the restrictive rights in force. This was determined to be the correct view. . . . The principle is clear. For land which is of no value, or is practically valueless, to the owner no compensation is payable. The land under the highways which is actually taken for these railways is, as we have seen, practically valueless, and the conclusion must be that the owners are not entitled to any compensation in respect of it. I am aware that this view is not universally held to be correct. It is argued that the owner has an interest in

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the soil, even though it is restricted by the rights of the public, and that that interest must be worth something to him. As far as I can find, the only authority to be quoted in support of this contention is the case of 'Goodson *v.* Richardson.' It was argued in that case, *inter alia*, that the plaintiff's right in the soil below the highway was one of little or no value to him . . . . Persons desirous of carrying their undertakings over or through other person's land, must, apart from statutory powers, make their bargain with each owner; and the value of the land these persons seek to acquire is, not its value to the owner, but the value which these persons are prepared to admit rather than sacrifice their scheme. When statutory powers are given, as in the case of railways, the legislature expressly deprives the owner of his power of veto, and in depriving him gives him statutory rights to compensation instead. . . . II. Secondly, as to damage by severance: Can the owners obtain compensation by reason of the severance of their land from other land held with it? Compensation for severance merely, apart from damage, has never been allowed. Damage to other land must be caused by reason of the severance. Damage in this connexion signifies depreciation in value owing to interference with the unity of the estate, whereby the land becomes less useful for the purposes for which it is held, either immediately or at some future time. On a review of the decisions on this part of the section, I am very doubtful whether in the case now being considered there is any such severance, as was contemplated by the legislature. Certainly there is none such as has been considered by the judges. The severing has always been a dealing with the property in such a way that, on looking at a plan of it before and after the severing, some change in the configuration of the estate would be apparent. Still, as has been repeatedly laid down, the question whether there has been severance or not is a question of fact dependent upon its own circumstances; and as there are no general principles whereby this question may be effectually determined, one has to be prepared for a finding that there is here a severance within the meaning of the section. What is the damage? In all cases the principle in assessing damages hereunder is the same. There has been an interference with the unity of the estate, and the land in consequence has become less useful to the owner. He cannot lay it out so effectively as a building estate; it can no longer be used as rifle butts (to quote some instances already decided) and he must be indemnified. The damage, be it noted, must flow from the severing and not from any purpose for which the severance takes place. Can it be said then, that the land here held with the land taken is any less useful by reason of such taking? I think not. The land taken, as we have seen, cannot be used or dealt with by the owner, owing to the existence of the public rights in the land above it. The public rights also affect the land held with it, since the owner cannot use this in any way so as to interfere with those public rights. As in the case of value the fact that the legislature has given someone else the right to turn the land taken to profitable uses, in spite of the public rights, does not entitle the owner to say: 'You are severing a piece of land which may now, by the notice to treat, be turned to use, and therefore you are making the whole of the holding less useful.' The owner is still bound by the public rights, and he can use his other land as well after as before the severance, and for precisely similar purposes, that is to say, he suffers no damage by reason of the severance. As has been said, in each case it is a fact dependent upon its own circumstances whether there be severance or not; but if it should be held that there be severance here, there is clearly no damage, and therefore no right to compensation for such severance.

III. Thirdly, as to compensation for damage by otherwise injuriously affecting other lands held with the lands taken by reason of the exercise of the powers of the Special Act or any Act incorporated therewith. The injuries which may arise from the exercise of statutory powers are of two kinds: (1) the depreciation of the property owing to vibration and noise; and (2) the actual damage to it by reason of the making or using of the line causing a subsidence on the adjacent land. Injuries of this sort may be suffered by all owners of property abutting upon the railways, whether their land be taken or not; but it is now well settled that owners whose land is not taken by the promoters are not entitled to any compensation for these matters, unless caused during construction. The case of such owners is admittedly hard, and has probably led to more divergence of judicial opinion than any other subject of judicial decision. Moreover, it is a curious fact that from the point of view of mere numbers, the majority have been in favour of giving compensation. It is worth while to dwell for a moment upon this point, since it illustrates the position of lessees whose leases are so worded as to exclude any demise of land beyond the front of their buildings or the edge of the pavements upon which these abut . . . ."

In further considering the right to compensation, the author referred to some of the numerous cases which had arisen, his conclusions being:—"To obtain compensation, then, for injuriously affecting land where the land itself is not taken, but injured only, the owner must establish (1) that the injury is an injury to his land or some right incidental thereto; (2) that the act causing the injury was authorised by the legislature; (3) that the injury was suffered as a consequence of the construction of the railway; and (4) that the Company's Special Act deprives him of his right of action at common law. To return to the owner whose land has been taken. As already stated, the Lands Clauses Act, 1845, gives to such owners the right to compensation for the damage they may suffer from the injurious affecting of their other lands, held with the land taken, by reason of the exercise of the powers of the Special Act or any Act incorporated therewith. To interpret this with reference to our subject it is necessary to determine (1) whether the possibility of damage arising from subsidence, vibration, and noise amounts to an 'injurious affecting'; (2) whether the land taken is so 'held with' the other lands as to be within the Act; (3) whether 'the exercise of the powers' refers merely to the building of the line, or whether it extends to the subsequent use of it; and, finally (4) whether the 'injuriously affecting' must be of such a nature as to be actionable at common law but for the Special Act taking that right of action away.

1. I have no doubt that, when land is taken, actual damage from subsidence, vibration, and noise is an 'injurious affecting' of the adjacent land 'held with' the land taken whenever it occurs. Whether compensation can be recovered depends on the determination of whether there has been any previous inquiry to assess compensation for the taking of the land. If there has been no such inquiry compensation can be recovered. If there has been such inquiry compensation cannot be recovered, for there is no power of holding a second inquiry to assess it, since the damage is of the nature of foreseen damage within the principles of Croft *v.* The London and North Western Railway Company. This brings us to the point whether the possibility of damage arising from subsidence, vibration, and noise amounts in itself to an injurious affecting for which the owner may be compensated. The answer is that such possibility, if reasonably apparent, is an injurious affecting. Whether the possibility is reasonably apparent must be ascertained from an investigation of all the circumstances of the case, namely, the composition of the soil, the method of traction, and the known effect of this latter on the structure upon which it is employed. . . . (2) Whether the land taken is 'held with' the other lands depends whether, on the facts, the case will come within the principle enunciated by Lord Watson in Cowper Essex *v.* The Acton Local Board as follows:—'Where several pieces of land, owned by the same person, are so near to each other, and so situated that the possession and control of each gives an enhanced value to all of them, they are lands held together within the meaning of the Act; so that if one piece is compulsorily taken, and converted to uses which depreciate the value of the rest, the owner has a right to compensation.' This principle is a wide one and will cover not only the case of land immediately abutting upon the highway held with the land beneath the highway which is taken for the railway, but also that of property in an adjacent street or square injuriously affected, and in the same ownership.

3. Where land is not taken, compensation for injurious affecting can only be recovered where damage is occasioned during the construction of the works. Where land is taken, compensation may be recovered for damage occasioned either by construction or by the future use. . . . 4. We have now seen that actual damage from subsidence, vibration, and noise, or the possibility that such damage may arise, is damage amounting to an injurious affecting; that, to invoke the application of this principle, it is essential that the lands taken be held with the other lands alleged to be injuriously affected; and that such injurious affecting may arise from the use of the works, and not from their construction merely. The final question is, must the injury be of such a nature as to be actionable at common law, but for the Special Act taking that right of action away? It will be remembered that where no land is taken, the injury must have been actionable at common law, an attempt was made to extend the rule to cases where land is taken. So far as actual damage from the use of the line is concerned, there would, I think, in the absence of negligence, be no right of action. . . . . Whether the bare possibility that damage may arise would be actionable, I am not prepared to say. The point has not been definitely decided, though it has been raised in argument. . . . ."

Before concluding his paper, the author dealt with the subject of the so-called "easements" in connexion with the electric railways.

In the discussion which followed, Messrs. Freeman, Clode, Colam, Pilditch, and Arnold Statham took part, and the opinion was expressed that the case of leaseholders was a very hard one, as, although their property might be damaged by the working of the railway, they could not obtain compensation because no land of theirs was taken. It was to be hoped that the vibration now caused by electric trains could be remedied, and that when future lines commenced working this difficulty would have been removed by the engineers. With regard to the making of subways connecting buildings on either side of the road, it was pointed out that when the Metropolitan Railway was constructed under the Euston-road the owner of property on both sides of the road was paid a substantial sum because he was able to show that the existence of the railway would prevent him connecting his property by subways, and thereby depreciate its value to him.

The Lord Chief Justice moved a vote of thanks to Mr. Berkeley, and said the paper was a most interesting and valuable one on compensation law. It contained nothing startlingly new, but the facts were put in such a way that they could be understood by those not versed in the law. He was of opinion that when land acquired an increased value by reason of being particularly suitable for the purpose for which it was desired to obtain it, the vendor, who was compelled to sell, should have the advantage, and the compensation should be based on the value to the purchaser and not on the previous value to the owner.

The motion was seconded by Mr. Watney, and carried unanimously.

The meeting then terminated.

AMERICAN ENGINEERING METHODS

On Saturday evening, before a meeting of the Builders' Foremen's Association, at the Memorial Hall, E.C., Mr. A. S. E. Ackermann, A.M.I.C.E., read an interesting paper on "Some Engineering and other Observations in 1901 During a 5,000 miles Tour in the United States." Mr. Ackermann visited the States to gain general experience of American engineering practice, and in particular to report on American methods of coal mining by machinery. During the four months he was there he visited New York, Philadelphia, Chicago, Buffalo, Easton, Atlantic City, Washington, Roanoke, the Pocahontas Coalfields, Bluefield, Cumberland, Pittsburg, Cincinnati, St. Louis, Milwaukee, Niagara, Boston, and other places. One of the first things which struck Mr. Ackermann were the express elevators or lifts, and he described their working at the Bowling Green Offices, at 11, Broadway, New York. This building was designed by Messrs. W. and G. A. Audsley, two Scotch architects. Mr. Geo. Audsley left England for America ten years ago, and had not regretted the step. The building has nine lifts worked by hydraulic power and steel ropes, although the most common source of energy in America is electricity.

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The tall buildings or sky-scrapers of New York are most substantially constructed of rolled steel joists and built-up sections of steel plates. Nearly the whole of the framework is put up first, and the brick and stone is fitted in afterwards, frequently from the middle upwards and downwards. Polished white marble is freely used inside for the walls, floors, and steps of the public parts, and what painting there is is usually white or cream colour. Everything is done, in fact, to obtain the greatest amount of light. At Milwaukee he saw a fine steel-framed building being erected. To put up the facing of stonework or terra-cotta, they do not use ordinary heavy scaffolding right the way up. To do so would mean an enormous expense for such tall buildings. Instead, they put two 9 by 3 timbers out of all the windows on one floor. These project, perhaps, 6 ft. Along their outer ends is laid a plank, and another along them against the face of the wall. On these two planks and opposite each window are trusses, and on them the ordinary scaffold boards. The whole appeared neat, simple, cheap, and secure. In New York he paid an instructive visit to the Metropolitan Power House in Houston-street, for here he saw the kind of machinery and the condition it was in when Americans scrap it. The plant here was put down in 1893 at a cost of 160,000*l.*, and with the other cable stations which were dismantled at the same time the total cost of machinery scrapped was 320,000*l.* In England this machinery would have been kept at work for another fifteen or twenty years.

At Philadelphia, Chicago, and Buffalo he visited the pumping-stations in connexion with the public water supply, and the public are enabled to walk into these places with less ceremony than there is in a museum. Each engine has a framed card of information upon it, stating the leading dimensions, capacities, when it was repaired and the cost of such repairs, price, &c. Everything is done to encourage public interest in engineering and to help people to instruct themselves on the subject. The marked difference between American and British methods in this connexion was most painfully evident at Niagara, where, on crossing the elegant steel bridge, the very first building, which was one of the power houses which he hoped to enter, bore the discouraging legend, "No Admission."

Modern American methods were strikingly illustrated at the works of the Ingersoll Sergeant Rock Drill Co. The works were one of the most highly-organised that were visited, everything being extremely systematic, and the card index very largely used in connexion with patterns, special tools, jigs, and stocks of all kinds. When a man wanted a tool he pressed a button, and a boy quickly attends to learn his requirements. The boy then proceeds to the tool store with the instructions, gets the tool, and delivers it to the workman. Valuable prizes are given to the smartest boys. Jigs, templates, and automatic tools are largely used, and the machinery is all well kept. This attention in the matter of keeping machines in good condition was noticeable all over America, where they run their machines for all they are worth, but look after them well. At Philadelphia he visited the Bureau of Commerce, which must be of the greatest commercial assistance to American manufacturers. In 1900 there were no fewer than 78,000 foreign inquiries, and one of the chief functions is to put inquirers for any American manufacturers into communication with the firms making such goods as are wanted. The commercial reports of the American consuls throughout the world are received there, and the various manufacturers are informed of likely markets for their goods. At the same town he visited the works of Mr. Louis Schutte, where exhaust steam ejectors, condensers, &c., are turned out; and here he had a good illustration of the large increase of output to be obtained by the use of specially-designed tools. A visit was also paid to the Baldwin Locomotive Works, where 9,000 men are employed. The hours the day shift works is from 7 a.m. to 6 p.m., and the night shift from 6 p.m. to 7 a.m., with only twenty minutes for food at midnight. At Bluefield he saw two automatic weigh-bridge machines, each of which can weigh 100 trucks per hour. At the celebrated steel works of Messrs. Jones & Laughlin, near Pittsburg, some of the details of manufacture are very different from British practice, and with the plant two shifts of seventeen men each can handle 2,000 tons of pig-iron in twenty-four hours. When the iron is being run off from one of the furnaces a sample is taken, and within forty-five minutes the results of the chemical analysis are telephoned back. At Johnstown he visited the Cambrian Steel Works and saw some of the three-high rolls at work. At Pittsburg he saw the steel building being erected for the H. C. Frick Coal and Coke Co., and he particularly noticed the crane. There was a huge centre post 60 ft. or 70 ft. high standing in the middle of the site, guyed to all kinds of surrounding buildings. This post was placed so as to keep the guys nearly horizontal. From the foot of the central post there was a jib which could be raised and lowered in the ordinary way, and could go all round, because the guys did not get in its way, and they could distribute material all over the place. At Cincinnati are situated the works of the Globe Wernicke Co., which are very up to date. To such an extent is power used that in the case of a large veneer machine in the form of a lathe, instead of the centre of the poppet-head being run up by hand there was a chain round the large hand wheel, and this was driven by a small motor, the switch of which was on the other side of the machine. By this means the man working the machine never moved away from one position, and hence the time saved. Many of the machines were very ingenious, particularly the glueing and sandpapering machine. At St. Louis he visited the Nelson Manufacturing Co.'s works, where all kinds of sanitary fittings are made, and at Chicago, amongst other places, he saw the Harvesting Machine Factory, where he saw sixty-five automatic machines being worked by six men. At Milwaukee he visited the E. P. Ellis Co.'s works, and Nye & Jenks' Rialto grain elevators, where the automatic labour-saving machines and appliances are remarkable.

The conclusions drawn by Mr. Ackermann are such as to compel him to take a hopeless view of the commercial prospects of Great Britain. The natural resources of the States are boundless, while those of England are largely worked out. The general standard of education in America is much higher considered from a scientific and commercial standpoint, and their engineers are thoroughly trained. He knew that there were many things in which Englishmen still led, but eternally patting themselves on the backs would not help them to keep that position, and it was this sense of false security, bred of years of unassailable prosperity and supremacy, which is doing much to help our decline. He did not by any means entirely lay this decline on the backs of the men, for he knew that amongst masters there was an immense amount of "stick in the mudedness," but those he addressed could do a great deal to make the country wake up. There must be more education, for it was the educated who were the most reasonable, who had the making of a nation, and who on the whole made the most money He was very sorry to say that in England in too many cases with the men it was—"Who is the three o'clock winner? and give us some more beer"; and he must say that sport was not going to keep them in front as a nation. America was not all perfect, but it was for them to copy the good things and leave alone the bad. After all they had not to depend so much on corporations and companies as on the individual.

ARCHITECTURAL SOCIETIES.

MANCHESTER SOCIETY OF ARCHITECTS.—The monthly meeting of this Society was held at the Chamber of Commerce on Thursday, the 13th ult., Mr. A. Darbyshire, the President, in the chair, when Mr. Charles M. Hadfield read a paper on "English Architecture of the Fifteenth Century," illustrated by lantern views. The prize for the Students' Monthly Competition was awarded to Mr. Warren Blackshaw, jun., of Stockport, for a design for a factory chimney.

SLATE TRADE.—Alarmist paragraphs have appeared in many papers predicting a slate famine. The leading Welsh quarries are well able to meet the present demand provided longer notice of their requirements be given by builders and contractors to the merchants, and by them to the quarries. There are also statements as to strained relations between masters and men. With one notable exception there is complete harmony. These paragraphs appear to be intended to "boom" a Transatlantic quarry, as they conclude by stating the high wages paid there, ignoring the fact of stoppage of work in winter owing to severe weather.

THE LONDON MASTER BUILDERS' ASSOCIATION.

THE dinner of the London Master Builders' Association was held on Monday in the Empire Hall, Trocadero Restaurant, Piccadilly-circus, W., under the chairmanship of Mr. William F. King, the President. The company numbered about 150, including the following:—Messrs. G. J. Lough and E. J. Brown, Vice-Presidents of the Association, and A. W. Spencer, the treasurer; Mr. C. Wall, President of the Institute of Builders; Mr. B. I. Greenwood, President, National Federation of Master Builders of Great Britain and Ireland; Mr. J. Willson, Master of the Carpenters' Company; Mr. Marsland Ellis, Master of the Tylers and Bricklayers' Company; Mr. W. H. Seth-Smith, President, Architectural Association; Colonel A. S. Harrison, V.D.; Colonel C. W. Stephenson, V.D.; Mr. W. F. Wallis, President of the Southern Counties Federation of Master Builders; and Messrs. H. H. Bartlett, J. Carmichael, W. T. Farthing, J. H. Gibson, T. Gregory, J. Greenwood, F. Higgs, R. S. Henshaw, F. H. A. Hardcastle, C. E. King, A. Killby, F. G. Minter, M. Marsland, W. Neal, G. Neal, A. E. Parker, J. C. Radford, J. W. Ritchie, W. Sapcote, W. Spooner, W. Shepherd, H. W. D. Theobald, S. Trevail, H. J. Treadwell, E. A. E. Woodrow, and T. Costigan, secretary.

The loyal toasts having been proposed by the Chairman and honoured,

Mr. W. Shepherd, Past President, proposed "The Imperial Forces," to which Colonel A. S. Harrison, V.D., suitably responded.

The toast of the evening, "The London Master Builders' Association and its President," was then proposed by Mr. H. W. D. Theobald, who referred to the large amount of good work the Association had accomplished since 1872, when it was started, and the great strides it had made since then. As the President would tell them, the Association had been very active during the past year, and had passed new rules under which still further progress was expected. As to the President, his office was no sinecure, as they would realise when he mentioned that this year there had been over seventy meetings of Council and of various committees connected with the Association. The meetings took place in the afternoon generally, and lasted from two to three hours, and it would be seen what a great deal of time their President had to give to the work. Their President was second to none in the determination and energy with which he had fulfilled his duties to the satisfaction of all.

The Chairman, in response, said the most important matter which they had had before them last year was as to the new rate of subscription, and their ideas were financially embodied in rule 16. It became evident some years ago that if the Association was to carry on its work successfully, in view of its increasing influence, that they must have a larger revenue and a substantial reserve fund. A scheme was drawn up last year during the presidency of Mr. Charles Wall, to whom the credit of it chiefly belonged, and it was finally adopted at a meeting in June. It had been asked: "What are you going to do with your increased funds? Are you going to quarrel with people and try and smash the unions?" They were not going to try and do anything of the sort; they desired to oppress none, nor rob any of their rights; but they did intend that no one should oppress them. As to trade unions, they must not forget that those unions existed and that they had large funds, a great following, and were a force to be reckoned with. The Association did not want to smash the men's unions, nor did he think it would be to their advantage if they could, and with the fair working of the new conciliation rules he did not despair of seeing one day the unions and the masters working together in harmony for the common good. As to the new rule, the best way to assess the amount of the subscriptions was a difficulty, but it was finally decided to take, as a basis, the amount paid in wages, which was the method adopted by the engineers and kindred associations with great success. It was thought that there might be some objection to letting their friends, but possible competitors, know what amount they each paid in wages, but this difficulty was got over by what he would call the "secrecy clause," which would be strictly observed. The President then referred in some detail to the levy proposed in each 100*l.* of wages paid, the maximum contribution being, as

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he remarked, trifling. He then made an appeal to members of the Association to support the Council in the matter by sending in their wages returns as quickly as possible. Moreover, he wanted them to help the Council personally by taking more interest in the affairs of the Association. He had observed, while in the offices of the Association, that members called and made suggestions or asked questions, but they were members of Council and not the general members of the Association, and those were the men they wished to see. The Council devoted much time and care to the affairs of the Association, but for all that he thought that at the general meeting the members, when there were vacancies on the Council, should nominate men for those positions and not leave it to the Council to do so. They should see that the Council had new men on it from time to time. The Association was worth supporting, and it was doing very well, and if they supported it properly it would take a position which it ought to take considering the interests it represents. As to the probable increase of expenditure they would have to meet, the National Federation, to which the Association was affiliated, would expect more subscriptions from them this year; then they would have to watch carefully the law affecting trades unions, so as to see that the effect of the Taff Vale judgment was not whittled away. Unfair municipal trading would also require their attention, and they might have to take some action in the matter, either alone or in conjunction with some other bodies. Then they wanted to give more legal support to builders who might be engaged in fighting questions which were of general interest to the trade. The question of foremen belonging to the men's trade unions would also require attention, for it was not always to the interest of the masters that foremen should do so, though until masters could offer foremen some corresponding advantages in the matter of sick pay and other benefits which they had to sacrifice if they left the men's unions, it was not to be expected that foremen would come out of them. As to the new conciliation rules, they were arranged a year or two ago. They provided for three representatives from any of the trades with three members of the Association. If there was joint conciliation there were three from each of the trades involved and six members of the Association. Excellent results had been obtained from the conciliation boards, and he had been particularly struck by the fair and honourable treatment they had received from the men's unions: the decisions had in all cases been loyally carried out and worked to. In reference to the trade rules, he might mention that the labourers, an excellent body of men, applied for rules and an increase of wages; the matter was thoroughly considered, but they were not able to grant the increase of wages. The painters asked them to state a minimum rate, but that was a very difficult thing to do, for painters varied so much and it was decided to leave matters as they are and let the men continue to be paid by results. No rules existed at present with these two trades. With the machinists they came to the same conclusion as with the painters, but new rules had been signed with them which were satisfactory, he thought. He might refer to a handbook which would shortly appear, prepared by Mr. J. W. Ritchie, who had placed at their disposal a great deal of valuable information which he had obtained in the United States. With the assistance of Mr. Costigan, their secretary, it was being prepared, and it would be of much use, though they would be glad of suggestions for its improvement. In thanking them for coupling his name with the toast, he felt he must say that the work of the Association was really carried on by the Council, and particularly by their past Presidents, who assisted the Association materially. A great deal of valuable work was done, too, by their vice-Presidents, Messrs. G. J. Lough and E. J. Brown, and the hon. treasurer, Mr. A. W. Spencer, while in Mr. Costigan they had an invaluable secretary, who quite ignored the ordinary limitations of the working day.

Mr. C. Wall then proposed "The National Federation of Master Builders of Great Britain and Ireland." The London master builders felt they should work loyally with the National Federation for the good of all. During the last plasterers' strike in London, the masters received much help from the National Federation. The Federation had been doing very much what the London Association had been doing, *i.e.*, trying to exist on nothing. Now they were beginning to see that they could not get something out of nothing, and not only that, but that they must have a fund to fall back upon in case of a labour war, which, of course, they did not desire. The Federation had been trying to put its affairs in order; they wanted more money, and he hoped the builders of London would loyally support them. It was necessary that the builders of the country should do what the engineers did a few years ago, *i.e.*, work together and determine to be masters of their own affairs. They did not want another conflict, and to see capital and labour idle on that account. With peace, prosperity would follow. Just now there was a depression of trade, not because men could not or would not work, nor because the money was not available, but because people were afraid to spend at the present time; but when peace was restored there would be a return of prosperity. Builders were very anxious to have a fair contract—an equitable contract—between master and man, between architect and builder, and between client and all. With a fair contract a builder felt confidence in his work, and also that he could get justice. The Federation had taken the matter up, and would, he believed, carry it through to the satisfaction of all parties. In regard to industrial disturbances, when a dispute occurred in a particular part of the country, the men thrown out of work went to another part and got employment. That was not fair fighting, and what they wanted was every employer of labour to help those masters who had locked out their men by refusing to engage those men, and if they were to do so, strikes and lock-outs would soon be over. They all desired to avoid disputes, for the benefit of masters as well as men and their wives and families.

Mr. B. I. Greenwood, President of the National Federation, who responded, said that the Federation was a powerful institution, but it ought to be more powerful than it is, and it would be more powerful when the new rules came into force, for the fact was that the Federation, like the Association, had been suffering from injudicious parsimony. This year they were turning over a new leaf, as they had heard. It would prove a more difficult matter to give effect in the Federation to the new rules than in the Association. Some men seemed to dissent from everybody else, and, it did not matter what rule was passed: they would see vital objections to carrying it into effect. Only that morning he had received a letter from a local secretary saying: "It is no good passing those rules; we cannot carry them out here." Well, they would have to be carried out somehow or other. He hoped those gentlemen who had not sent in their returns would do so without delay, for there was nothing to hesitate about. As far as he was concerned, any one could know what wages his firm paid. Why should there be any secrecy in the matter? If any one wanted to know what profits his firm made that would be another matter, but the one thing had no relation to the other. He thought he could safely say that the six builders of London who paid the most in wages would not be the six builders who made the largest profits in London. This hesitancy to disclose what was the amount of wages paid was nonsense: it was not worthy of consideration. If for the good of the trade it was necessary to disclose, in confidence, the amount of wages, let them do so without delay. It was difficult to impress upon the local associations the vital necessity of this matter. The National Federation was difficult to organise, for the customs prevailing in one part of the country were so different from those in another part—so different sometimes that one could almost think the people belonged to different countries. Another difficulty with the Federation was that in builders' organisations there were all sorts and conditions of men, from those who carried out big contracts down to those who employed but a few men. They were all builders, and some of each kind belonged to the Federation, and it was difficult to organise men whose interests were not always the same; but in spite of all this the Federation exists, and had existed for many years. When they were engaged in the struggle with the Plasterers' Association (a national association) what was done in the south was backed up in the north of England, though there were many who prophesied that when they entered upon that struggle it would mean the death of the Federation. There was a great strain, he admitted, but they got through satisfactorily, although they were not loyally supported all over the country. He was glad to say that the Federation was now stronger than ever it was. As to the new form of contract, the Institute of Builders were in communication some time ago with the Royal Institute of British Architects for the purpose of arranging a definite and final form which would be fair to the builder and the client. The councils of the two Institutes arrived at an agreement, but unfortunately that agreement was not adopted by the general body of the Institute of Architects, and consequently it could not be regarded as finally approved by that Institute. But the necessity for an official form of contract for builders was so great that the Institute of Builders had been prevailed upon to publish the form agreed upon by the Councils of the two Institutes—of course with a proper explanation that the form had not been adopted by the general body of architects—and to circulate it throughout the country. The National Federation had under consideration whether the form should be adopted by builders from the north to the south, and the matter would come up for settlement in July. If adopted, he hoped the master builder would adhere to it. It was difficult to understand how any sane man could sign some building contracts, though the cases of grossly unfair contracts were exceptional. It was for the protection of builders from the form of contract which was generally prepared by the client's solicitors—rarely by the architect—that it was desirable to have a settled form of contract which they could stick to. The notions of some solicitors as to contracts were amusing. Solicitors often saw one side, and it loomed so large that it obscured the other. Solicitors started with the assumption that the builder was a rogue, and six or eight pages were devoted to providing against his roguery. It did not seem to occur that any one else could be a rogue, and the other side was generally summed up in one brief clause as to the obligations of the other party to the contract. That ought to cease, and the more clients relied on the architect for the form of the contract, the less trouble there would be.

Mr. J. Carmichael then proposed, "The Visitors (including Public Bodies, Architects, and Surveyors)." In the course of his remarks, he said they must all agree that the London County Council had done splendid work in improving the social life of London; but as ratepayers he thought they had a serious grievance against the Council for wasting money in their endeavour to keep alive that parasitical creation of theirs, the Works Department.

Colonel C. W. Stephenson, V.R., responded, and the proceedings terminated shortly afterwards.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

THE ninth meeting of the Discussion Section of the Architectural Association for this session was held at 56, Great Marlborough-street, W., on Friday last week, when Mr. F. C. Eden read a paper entitled "The Organ in Church: its Architectural Treatment and Position." Mr. R. H. Weymouth was in the chair.

Mr. Eden dealt with the subject in a most able and interesting manner. He disagreed with the "illumination" of the pipes, but thought the woodwork should be decorated. He showed, by a sketch on the blackboard, that the natural lengths of organ pipes were not such that they could form a symmetrical arrangment on each side of a centre: the largest pipe might be in the centre, a shorter one to the left, a still shorter one to the right, and so on; so that the line would be different on each side of the centre. This, however, was the natural treatment, and he thought it had a picturesque and characteristic appearance. It was difficult to arrive at the proper position when the various authorities differed so widely, but he advocated the placing of the organ (1) in the west gallery, (2) over the rood screen, (3) behind the altar. In small parish churches he would like to see the village orchestra reinstated.

The discussion was opened by the Chairman, who proposed a vote of thanks to Mr. Eden, which was seconded by Mr. E. W. M. Wonnacott, and supported by Messrs. Geo. H.

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Smith, W. J. Tapper, Lewis Jacob, W. B. Hopkins, Geoffrey Lucas, and C. E. Tucker.

The Special Visitor of the evening was Mr. H. H. Statham who, in summing up the discussion, said they had listened with great pleasure to Mr. Eden's paper. He thought the treatment of the larger organs should be symmetrical in design but that the pipes might be left irregular in the small organs. Mr. Statham strongly objected to the placing of organs in chambers and urged that plenty of space should be given to the instrument. Though he did not wish for noisy organs, he thought what our organs wanted was weight of tone, and that we were behind the Germans in this respect, and he emphasised the necessity for a large pedal organ, especially for accompanying congregational singing. That could not be had with a small organ; pedal pipes requiring double space.

The vote of thanks was made to include the Special Visitor, and having been put to the meeting was carried with acclamation. Mr. P. C. Eden having replied, the meeting terminated.

The chairman announced that the next meeting would be held on Friday, February 28, when Mr. Vivian W. King would read a paper on "Design in Furniture."

BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION:

ANNUAL DINNER.

THE annual dinner of the Provident Institution of Builders' Foremen and Clerks of Works was held in the King's Hall, Holborn Restaurant, on Saturday last week. The chair was occupied by Mr. A. E. Parker (Messrs. Patman and Fotheringham), and there were over 550 members and friends of the Institution present, including Major Isaacs, Lieut.-Col. Harrison, V.D., and Messrs. H. J. Gordon, W. Woodward, H. T. Treadwell, C. Wall (President of the Institute of Builders), W. F. King (President of the London Master Builders' Association), F J. Dove (the Governor of the Institution), F. Higgs, and T. Costigan.

The loyal toast having been proposed by the Chairman and honoured,

Mr. H. T. Treadwell suitably proposed "The Navy, Army, and Imperial Forces," which was ably responded to by Lieut.-Col. Harrison.

The Chairman then gave the toast of the evening: "The Provident Institution of Builders' Foremen and Clerks of Works." But for institutions of this kind, he said, there would be more men found at street corners and in want. The building trade was a precarious trade, and one day a foreman or clerk of works was in employment and in receipt of good wages, and another day, through no fault of his own, but simply through the inevitable fluctuations of trade or the collapse of a job, due to bad times or other causes, he found himself out of work and in need of help, perhaps. The present war had affected and was affecting the building trade as much as, if not more than, any other trade in the country, and the effect of that war was being felt by masters, as well as by men like foremen and clerks of works. It was right that those who had it in their power, and were interested in builders' foremen and clerks of works, should do what they could to help this Institution in every way they could, and thus help men who generally so faithfully carried out instructions of architect or builder. There could be no doubt as to the need of such an institution, for a man could be so suddenly cut off by death or sickness, and unexpectedly need help either for himself or his family. The Institution had paid away over 11,000*l.* to members and their widows and the orphans, and last year 400*l.* was paid in pensions: one member's widow, still living, had been paid over 300*l.*, having been practically kept for the greater part of her life. The Institution was not political in any form, nor did it take the part of any society; it existed simply for the benefit of those members, or the wives or children of members, who were in need. While the Institution was carried on on those lines, architects, surveyors, and builders would heartily support it.

Mr. John Beer, Secretary, in response, said that in the past year there had been steady progress in their affairs. The Institution was established about sixty years ago, and the first year there was endowed a fund which amounted to 60*l.* That had gone on increasing until it now reached the sum of 6,000*l.*, but unfortunately it was not large enough for what they wanted to do, though it had enabled them to increase the amount of the pensions from time to time. For many years the maximum pension the directors were allowed to grant was 12s. per week to the men and 5s. per week to the women, but now, through the generosity of donors and subscribers, the rules had been altered so as to give the directors power to grant 17s. 6d. per week to the men and 7s. per week to the women. There were now five men pensioners, thirteen women, and eight children. It was hoped that before long it would be possible to give the men 1*l.* a week, the women 10s., and each child 5s., and in that way make the closing years of life happier than they otherwise would be. Some years ago a boy became chargeable to the Institution and a grant was made. Shortly afterwards there was a vacancy in the Caledonian School and the boy was elected; but the Institution did not withdraw the grant, and next year, when the boy left the school, he would have 50*l.* or 60*l.* with which to make a start in life.

The toast of "The Architects and Surveyors" was then proposed by Mr. C. Wall. In the course of his remarks he said that architects were often placed in a very difficult position, for as honourable men they found it no easy task to act impartially between the client and the builder. They desired to do right in that position, and they were not to be envied when the builder, say, felt he was not being quite fairly done by; but taken as a whole they did their duty fearlessly and fairly. He had just read the report of a lecture by a lady on the subject of the desirability or otherwise of ladies entering the profession of architecture*. If they did, he did not know what builders and builders' foremen would do, and perhaps it was best not to contemplate such a possibility; builders and others, he was sure, would rather have matters remain as they were at present. He once had a lady traveller call upon him, and in view of the time she took trying to assure him he wanted something he did not want, he hoped never to see another. He hoped the architectural profession would show a bold front and would keep ladies from entering the profession. Architects were the artistic class of men, and the surveyors the measuring class, and builders liked surveyors who were well able to discharge their duties; which, as a rule, they did to the satisfaction of all parties.

Mr. W. Woodward, who replied, said there was a community of interest between builders' foremen and architects, for each of them tried to please the employer and do the best they could in that direction. The architect who neglected the opinion and assistance of builders' foremen neglected assistance which was of the greatest value in carrying out a building contract. He always said to the foreman: "Here are the drawings and specifications; whatever you can suggest which you think is an improvement, either in construction or otherwise, I hope you will suggest it to me, and I shall be thankful to you if you do." He had got the greatest assistance in that way, for builders' foremen often saw things in the carrying out of a work which could not occur to the busy architect. Builders' foremen were useful in many ways, and architects were often thankful to them for the way in which they got over difficulties raised by District Surveyors. The same remarks applied to the County Council requirements (to satisfy which was often a most difficult matter) and the requirements of the sanitary inspector. As to clerks of works, he hoped they would always call attention at the earliest moment to any defect in material or workmanship they might notice, and not allow the work to proceed and cause trouble in the end.

Mr. H. J. Gordon, in submitting the toast of "The Builders and Contractors," said that architects who found a good builder and made a friend of him would find their work carried out well and successfully. With the toast he coupled the name of Mr. King, the President of the London Master Builders' Association.

Mr. King briefly responded, remarking that it was always pleasing to hear of a good feeling between the trade and the profession.

Mr. J. Stapleton proposed "The Governors, Trustees, Donors, Honorary Subscribers, and Visitors," and in the course of his remarks he showed how carefully the affairs of the Institution were managed. With the toast was coupled the names of Mr. F. Higgs and Mr. F. Costigan.

Mr. Higgs said what he had learnt of the Institution had been an eye-opener to him as to its character and stability. The Institution had been established sixty years and it had considerable funded property, but he thought they should enlarge their membership beyond what it was at present, otherwise the funds would go on increasing unreasonably.

Mr. Costigan said the funds were administered in the best possible way and with the least expense. The Institution encouraged those who were disposed to help themselves, and all who could should help a society that was doing that.

Mr. F. Hann then proposed the toast of "The Chairman."

The toast was received with musical honours, and the Chairman having replied, he proposed "The Press," coupled with the name of our representative, who responded.

During the evening subscriptions and donations to the amount of over 270*l.* were announced.

* See our issue for February 22.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend the Shoreditch Borough Council 14,660*l.* for alteration to offices; the Poplar Borough Council, 5,630*l.* for paving works and 20,000*l.* for electric light installation; the Shoreditch Borough Council, 18,000*l.* for electric light installation; the Wandsworth Borough Council, 7,000*l.* for street improvement; and the Hampstead Borough Council, 7,480*l.* for electric light installation.

The Engineer's Department.—The General Purposes Committee brought up a report containing the following recommendations:—

"(*a*) That the Electrical Engineer (Mr. Rider) be removed from the engineer's department and be placed under the Tramways Manager.

(*b*) That the following course of procedure in connexion with electrical tramways be approved, viz:—

(i.) On the Tramways Manager submitting a proposal for a new tramway, or for the conversion of an existing tramway into an electrical tramway, the proposal shall be referred to the Chief Engineer for report as to any widenings of streets, interference with sewers, pipes, or alterations to headway of bridges which may be involved.

(ii.) The Chief Engineer shall prepare the plans and specifications for all roadwork, including the laying of tracks and the conduit construction in consultation with the Electrical Engineer as regards the electrical portion of the work, and shall be responsible for the proper carrying out of the work by the contractors, and on completion shall hand over the tramway to the Tramways Manager.

(iii.) The Tramways Manager shall prepare the plans and specifications for all machinery in the generating and sub-stations, for the underground electrical cables, for overhead electrical equipment, and for the rolling stock, and shall be responsible for the proper carrying out of such work by the contractors.

(*c*) That the technical work of the engineer's department be in future divided into three branches, viz.:—

(i.) The Parliamentary, Improvements, &c., Branch (to include the water, highways, &c., branches, also the general drawing work and the duties at present devolving upon the Mechanical Engineer).—The branch to be under the supervision of Mr. Elwin.

(ii.) The Main Drainage Branch—to be under the supervision of a new assistant engineer.

(iii.) *The Bridges, Tunnels, and Ferries Branch.*—To be under the supervision of an assistant engineer, it being understood that large and important works may, during construction, be placed, if considered desirable, under the exclusive charge of an engineer specially engaged for that purpose.

(*d*) That Mr. C. Elwin be styled 'chief assistant engineer,' and that his salary be increased from 800*l.* to 900*l.* a year, and subsequently by two annual instalments of 50*l.* to 1,000*l.* a year.

(*e*) That the salaries of the two assistant engineers in charge of the main drainage branch and the bridges branch be 800*l.* a year each."

Cost of Brickwork and the Works Department.—The Report of the Finance Committee on the cost of brickwork executed by County Council workmen, which was printed in the *Builder* for February 15, page 160, was then considered, and debated at considerable length.

Mr. R. Williams asked for the mode of pro-

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cedure adopted by the Committee in arriving at the number of bricks laid per day.

Lord Welby, Chairman of the Committee, said that the result was arrived at by taking the actual number of bricks used and dividing by the number of days. As to the actual number of bricks laid, the Sub-Committee who considered the whole matter had come to the conclusion that they would not be justified in stating the exact number laid.

Mr. Beachcroft said that in the Westinghouse power works now being erected, the number of bricks laid was 1,400 per man per day.

Mr. Burns asked if Mr. Beachcroft could tell them the character of the bricks, the thickness of the walls, whether mortar was used or cement, and under what conditions the work was carried out. Did that work resemble the class of work found in a fire station or lunatic asylum built by the Works Department?

Lord Welby said probably many members of the Council had heard from some one else the number of bricks which ought to be laid per day per man, and when they based their inquiries on such information, they did not consider whether the works were comparable.

Captain Swinton said that the principal charge made had not been answered—viz., that the Council must be held responsible for the development of the go-easy practices in the building trade generally. The members of the Council were sent to represent the whole of London, and not to make London the cockpit of Socialistic theories. The questions really before them that day were whether they were standing for honesty or dishonesty of work; were they standing for true work or skulking; and whether they were standing as a bracing force in London industry or as a demoralising force. On these points they had no information in the Report.

Mr. Peel, M.P., said that, if the charges were true, the frankest way would be for the Committee to make a clean breast of it. He envied Lord Welby his forty years' experience in the Treasury, which enabled him to practise an Oriental demeanour in bringing up so absurd a Report. He knew Lord Welby had a keen sense of humour, and must be quietly laughing up his sleeve at such a Report. The Report simply consisted of shifty evasions, and not one charge had been dealt with in a straightforward way.

Mr. R. Williams said he should be perfectly satisfied with any bricklayer who laid from 350 to 400 bricks a day, and he would like to see people who cried "shame" try to lay, or even lift, that number. There were many things to do in bricklaying besides lifting up the bricks and putting them in position.

Mr. Taylor said he was astonished that so much importance should be attached to the scribblers in the *Times* on questions of which they knew nothing. He suggested that the attack was organised by the brickmakers. It was true that bricklayers now laid fewer bricks than they did twelve or thirteen years ago, but the hours of labour had been shortened, and the class of work now demanded was very different. No complaint was made as to workmen restricting their output until they refused to continue scamping work at the bidding of their employers. He challenged any one to say that workmen now did not give better work than ever before.

Mr. White pointed out that neither Mr. Taylor nor any previous speaker had denied the statement as to the limit of 330 bricks per day. There ought to be no difficulty in saying whether or not that was right. It was an extraordinary omission that no specific account had been kept of the cost of brickwork in the Works Department. The whole result of the operations of the Works Department showed that the Council were not getting enough work for the money. If the seventy clerks in the Works Department at Belvedere-road could not give them the prime cost of the brickwork, the sooner they got rid of them the better. If they got the prime cost, they could soon find out how many bricks were laid per day. The cost of brickwork per rod was from 14*l.* to 15*l.*, and yet in a recent sewer at Woolwich by the Works Department, in connexion with which there had been a heavy loss, the cost per rod, so they had heard, was 22*l.* It was true that in brickwork there were various classes of work, but it was usual to have the work put together and an average taken. The great question was what was the cost per rod throughout the work, and when that was found out it was easy to say the number of bricks laid per day.

Mr. Stephen Collins said there was a great difference in the brickwork of to-day compared with that of some years ago, when rough bricks, covered with cement, were used. Then it was possible to lay 1,000 bricks quite easily, but matters were different now, especially as the hours of labour were eight instead of ten. Gauge work could not be carried out in that rapid way. As to the cost of brickwork, on a large asylum he knew he was told that the brickwork had been nearly 20*l.* per rod. As to the charge that men were encouraged to "go slow," he did not know much about bricklayers, but in connexion with the stonemasons he had never heard of anything of that kind so far as the Operative Society of Stonemasons was concerned.

Sir Arthur Arnold said he did not think any one reading the Report could feel satisfied with it, but consideration must be given to the circumstances of the case. Suppose the number of bricks laid per day by the Council's workmen had been stated, the number might be taken by the men as a maximum; but he thought the price per rod ought to have been given, and if that information were supplied it would be quite easy to discover if the Council's brickwork was being done with economy. There was no question as to the character of the Council's brickwork, as had been proved at the special inquiry held some years ago. As to the electrical-power works for the Westinghouse Co. at Manchester, of course it was quite an easy matter for the men to lay 1,200 bricks in the foundations, which were of great thickness; but it was a different matter in building the framework of windows for a fire-station, say, and 400 bricks would be a very good day's work then.

Lord Welby, replying on the discussion, said the Committee came to the conclusion that they would probably give rise to a false impression if they stated what was the particular number of bricks laid so far as they arrived at it.

On a division, the Report was carried by 87 votes to 26.

Spitalfields Market Bill.—The Parliamentary Committee recommended the Council to oppose the City of London (Spitalfields Market) Bill.

Mr. Beachcroft moved, and Mr. Sankey seconded, an amendment to limit the opposition of the Council to the question of securing clauses to safeguard their rights.

The Council divided—for the amendment, 26; against, 86.

The Committee's recommendation was adopted.

It was also decided to oppose the North Metropolitan Electric Supply Bill.

Census Returns for 1901 as to Overcrowding.—The Housing of the Working Classes Committee reported as follows:—

"We have had before us the recently-published census tables, which show the prevalence of overcrowding in London generally and in the several metropolitan boroughs in tenements of less than five rooms. As we were of opinion that the Council would desire to have any available information on this important matter given at the earliest possible moment, the statistical officer has prepared a preliminary report upon these tables. This report deals with the broad general results of the information to be derived from the tables published. Further and more detailed information will be available when similar census statistics as to the enumeration districts in London are supplied to the Council. We have given instructions for a copy of the statistical officers' report to be sent to each member of the Council.

It appears from this preliminary report that in 1891 there were 831,668 persons living in 145,844 tenements of less than five rooms. This gives an average of 5·70 persons per room. In 1901 there were 726,096 persons living in 124,773 tenements of less than five rooms. This gives an average of 5·88 persons per room. Both the amount, therefore, and the density of overcrowding in such tenements appear to have been on the whole reduced, since 1891, except in the case of the Borough of Stepney. With regard to tenements of more than five rooms, in 1891 there were 1,889,475 persons living in 308,918, such tenements, thus giving an average of 6·11 persons per tenement. In 1901 there were 2,086,752 persons living in 347,516 such tenements, thus giving an average of 6·00 persons per tenement. There appears, therefore, to have been an increase in the number of tenements of more than five rooms, and an increase in the number of persons occupying such tenements, but a decrease of ·11 in the average number of persons per tenement. This, again, points to a decrease in the prevalence of overcrowding since 1891.

We must, however, emphasise the fact that the results arrived at in this report are of a general character, and that the particular results to be hereafter ascertained may not in all cases bear out the general conclusions above noted as to the decrease of overcrowding."

Flashlights.—The Local Government and Taxation Committee reported as follows:—

"We report, for the information of the Council, that on January 30 proceedings were taken by the police under the Council's by-laws with reference to an alleged flashlight at No. 1, Sloane-street, Chelsea. Evidence was given to the effect that the light referred to was an illuminated advertisement produced by 214 electric lamps changing in colour from white to red, that the lights faded away and grew again to maximum intensity with an interval of about four seconds of absolute darkness, and that, notwithstanding the gradual changes, the light was dangerous, as horses were startled by it. The defendants contended that the light was not a flashlight within the meaning of the Council's by-law, but the magistrate held that the light came within the words of the by-law, 'altering suddenly in intensity,' and was dangerous to traffic. As it was a test case, a penalty of 20*s.* and 23*s.* only was imposed. The magistrate declined to state a special case, stating that he had given his decision entirely on a question of fact."

The Council adjourned at 7 o'clock.

COMPETITIONS.

WORCESTER VICTORIA INSTITUTE EXTENSION.—At a special meeting of the Library and Museum Committee on the 21st ult., Alderman Harry Day presiding, it was decided to adopt the recommendation of a specially appointed Sub-committee for an extension of the Institute, at an estimated cost of 6,000*l.*, to meet the demands upon the accommodation in consequence of the rapidly increasing number of students, and of the subjects included in the syllabus. The City Council are to be urged to sanction the proposal, and to suggest in what way the necessary funds shall be provided, whether wholly or only in part by public subscription. After considerable discussion, it was decided to invite plans for the proposed new buildings from Worcester architects, and from three students who, while attending the institute classes, secured the highest possible awards for this class of work. Their names are A. G. Parker, A. J. Pitcher, and W. G. M. Thomasson. The existing buildings were planned by a London architect.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting held on the 19th ult., Dr. W. de Gray Birch, F.S.A., hon. treasurer, in the chair, Mr. A. R. Goddard, of Bedford, exhibited a piece of Roman mortar found near the site of the Roman villa which has just been unearthed in Greenwich Park. Dr. Winstone exhibited an elegantly shaped, wrought-iron, ornamental two branch candle-holder, 7 in. high, the branches measuring 3 in. across from centre to centre, said to have been found in the Thames, together with some ancient keys which were also exhibited. In the churchwarden's accounts of the Royal Parish of St. Martin-in-the-Fields from the year 1525 to 1603, there are numerous entries of receipts for lights at funerals, the first entry being for 4d. for small lights at the burial of a child. It was thought that the branch in question was for the purpose of holding the small lights used on such occasions. Mrs. Collier read a paper upon "St. Christopher, and some representations of him in English churches," which was illustrated by several engravings, etchings, and coloured prints. It seems that St. Christopher may claim the distinction of being more frequently represented in cathedrals, abbeys, and churches in this country than any other saint, excepting only St. Mary the Virgin. So far as Mrs. Collier's researches have gone she has discovered as many as 183 representations of the subject in various parts of the country, chiefly as wall paintings. The paper dealt at length with the history, authentic and apocryphal, of the Saint, and pointed out the cause of the great popularity he received, although for the first few centuries after "his death" he was treated with comparative neglect. Apparently there were not many churches dedicated to St. Christopher; there was, however, one in London (in Threadneedle-

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street) which was pulled down to make room for the Bank of England in the latter part of the eighteenth century. In the discussion which followed the paper Mr. Gould, Mr. Patrick, Mr. Compton, the Chairman, and Mr. Goddard took part, the latter remarking that the churches at Bartlow in Essex, and Llantwit in Wales are dedicated to St. Christopher.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Fulham.—That the application of Mr. C. Thomas for the Council's consent to his retaining for a further period the one story shop on the north side of Harwood-road erected by him beyond the general line of buildings be granted.—Consent.

Hampstead.—Buildings on a piece of land on the north-east side of Finchley-road and north-west side of Platt's-lane, Hampstead (Mr. C. H. B. Quennell for Mr. G. W. Hart).—Consent.

Bow and Bromley.—The retention of a one story addition at the rear of No. 106, Campbell-road, Bow, abutting upon Fairfoot-road (Messrs. W. A. Hills and Son for Mr. C. Yates).—Consent.

Lewisham.—Pents at the entrances to seven houses on the east side of Brockley Rise, Lewisham (Mr. H. Lillywhite).—Consent.

Lewisham.—Pents at the entrances to twenty-two houses on the north side of Stillness-road, Lewisham, between Brockley Rise and Crofton Park-road (Mr. H. Standen).—Consent.

Lewisham.†—Two pents at the front and side entrances respectively of a dwelling house on the north side of Codrington Hill, Lewisham (Mr. J. Taylor).—Refused.

Hampstead. — Thirteen dwelling-houses on the south-west side of Haverstock Hill, Hampstead, southward of Belsize-avenue (Mr. C. J. Bentley for Mr. J. C. Hill.)—Refused.

Fulham.†—A building on the west side of Holyport-road, Fulham, at the corner of Crabtree-lane (Mr. H. J. Greenham).—Refused.

Lewisham.—A bank building on the south side of London-road, Forest Hill, at the corner of Dartmouth-road (Messrs. Tolley & Son for the London & South Western Bank, Ltd.).—Refused.

Width of Way.

Fulham.—The retention of additions to the Walham-green Sanitary Laundry with the external walls at less than the prescribed distance from the centre of the roadway of Garden-row, Fulham (Mr. A. Howard for Mr. A. Chubb).—Refused.

Width of Way and Lines of Frontage.

Marylebone, East.†—The rebuilding of Nos. 164 to 182 (even numbers only), Oxford-street, St. Marylebone, abutting upon Winsley-street, Binstead-street, and Castle-street East (Mr. R. F. Atkinson and Mr. A. J. Gordon for Mr. S. J. Waring, jun.).—Consent.

Finsbury, East.—Buildings on the sites of Nos. 193 to 221 (odd numbers only), City-road, Shoreditch, with external walls of such buildings at less than the prescribed distance from the centre of the roadway of Westmoreland-place, and in advance of the line of buildings in City-road (Mr. E. B. P'Anson for the Governors of St. Bartholomew's Hospital). Refused.

Hackney, North.—Residential flats at the rear of Nos. 68, 70, 72, and 74, Albion-road, Stoke Newington, to abut upon Church-path, and a pathway leading therefrom to Albion-road (Mr. A. P. Osment).—Refused.

Deviations from Certified Plan.

Paddington, South.—Deviations from the plan certified by the District Surveyor, under Section 43 of the Act, so far as relates to the proposed rebuilding of a stable, with living rooms over, on the site of No. 12, Connaught-mews, Edgware-road (Mr. P. Dollar for Mr. F. Verney).—Consent.

Dwelling Houses on Low-lying Land.

Deptford.—That the solicitor do prepare a licence under Section 122 of the Act to Messrs. Farquharson Brothers for the erection of a building on low-lying land at the junction of Lovelinch-street and Rollins-street, Deptford.—Consent.

Deptford.—That the solicitor do prepare a licence under Section 122 of the Act to Mr. F. J. Johnson for the erection of two cottages on low-lying land situate in Trundley's-road, Deptford, at the corner of Sandford-street (Mr. W. Wilkinson on his behalf).—Consent.

*** *The recommendations marked † are contrary to the views of the local authorities.*

REREDOS, RAINHAM PARISH CHURCH, ESSEX.—On the 18th ult. a new reredos was dedicated in this church. The work is in oak, with very elaborately carved fifteenth century canopies, and the panels diapered in gold and colour. The work is from the studios of Messrs. Taylor & Clifton, of London.

CARPENTERS' HALL LECTURES.

THE first of the Carpenters' Hall Lectures this year on matters connected with building was given by Dr. J. A. Fleming, F.R.S., on Thursday last week, the subject chosen being "The Transmission of Light and Electricity." He began by giving an historical *résumé* of the methods of measuring the velocity of light, and pointed out that as early as 1675 Roemer had found that it was 186,000 miles per second. He had noticed that the eclipses of Jupiter's satellites always preceded their predicted times when the earth and Jupiter were on the same side of the sun, and happened later when they were on opposite sides; hence, knowing the diameter of the earth's orbit, it was easy to calculate the velocity of light. MM. Fizeau and Foucault had made actual measurements of the time light took to travel to a mirror some miles away and be reflected back, and their results corroborated Roemer's calculations. Thomas Young gave a conclusive proof that light was a form of wave motion, and not a substance, by showing that two rays of light when added together can, in certain circumstances, produce darkness, a result which would be impossible if light was material.

Dr. Fleming gave certain data, from which he calculated that the heat radiated per square foot at the sun's surface was equivalent to burning 50 lbs. of coal per minute, whilst in the largest liners the amount of coal burnt per square foot of grate surface was only 50 lbs. per hour. The question arises, How is all this heat produced in the sun? If the sun were molten steel the heat would not last a week at the rate at which it is dissipated. If the earth were a ball of coal, and were dropped into it it would only last twenty hours. The only sufficient cause of the sun's heat is that it is due to compression. It has been calculated that the sun is 16 in. smaller every day, but this rate of diminution would not be perceptible even in 10,000 years. The horse power of the sunlight absorbed and wasted on the surface of the earth is 5,000,000 per square mile. Hence the horse power developed at Niagara is nothing compared with the energy wasted on a few square miles of the earth's surface.

The lecturer, after giving a clear description of the dispersion of white light into its primary colours and how all these coloured rays travel with the same velocity in the ether, went on to describe the invisible waves in the ether and how they can be detected. He pointed out how Hertzian waves always move in straight lines. Wax, glass, cardboard, and wood are transparent to these rays, whilst silver paper, wire gauze, the human hand, and water are opaque to them. Striking experiments were shown to illustrate the reflection and refraction of these rays. The action of the coherer used to detect them was explained by saying that the radiations falling on the metal filings on the tube made it a conductor of electricity and hence enabled the battery to work through it and ring a bell.

After explaining the atomic and molecular theory of matter, Dr. Fleming gave an account of Professor J. J. Thomson's discovery that atoms could be split up into corpuscles.

Sir W. Crookes discovered that when a current of electricity was passed through two platinum wires sealed into a vacuum tube a special kind of radiation comes away from the terminal where the current left the tube—this radiation is a stream of corpuscles. If we have a metal cross hung inside a Crookes' tube, then it will prevent some of the corpuscles striking the glass, and a dark shadow of the cross will be seen. If the cross be now shaken down, a bright shadow will be seen on the glass owing to the fact that the cross had previously prevented part of the glass from being bombarded by these corpuscles. The radiating stream from the cathode can be deflected by a magnet, and the material particles forming the stream are present in every flame and in very hot bodies.

Substances which have the power of giving out corpuscles by themselves are called radio-active. The best known and most powerful of these is radium. Every corpuscle is charged with negative electricity which cannot be separated from it; in fact it is thought that these corpuscles are negative electricity, and that an electric current is simply a procession of them.

Light waves exercise a very slight pressure. Professor Lebedew, of Moscow, has recently measured the pressure of light, and found it to vary between 2¼ and 4½ lbs. weight per square mile, depending on whether the substance is black or white. The sun's corona is an electrical phenomenon; it consists merely of corpuscles pushed out from the chromosphere by the pressure of light. In the same way the tail of a comet consists of corpuscles, and the radiating pressure of light always keeps them pointing away from the sun. The Aurora Borealis and the Aurora Australis are made up of corpuscles, and the reason why they appear at the poles is that they are attracted there by the earth's magnetism.

The lecturer concluded by giving some data about the power available on the earth for working machinery. He regretted that electricity was not more largely employed in coal mining in this country. In America 33 per cent. of the total coal output was raised to the surface electrically whilst in England only about 1 per cent. was so raised. The discourse was illustrated by many striking experiments, and was listened to by a large and enthusiastic audience.

BUILDERS' ACCIDENT INSURANCE COMPANY.

THE twenty-first annual Report of this company was held at the registered offices, 31 and 32, Bedford-street, Strand, London, W.C., on Wednesday, the 26th ult., the Chairman, Colonel Stanley G. Bird, presiding. The notice convening the meeting having been taken as read, the Secretary, Mr. R. S. Henshaw, read the minutes of the previous meeting.

The Chairman, in moving the adoption of the Report and Balance-sheet, said he was glad to be able to point out the improved condition of the company. The funds at the beginning of this year were in excess of those at the commencement of last year. There was one remark he would like to make with regard to paragraph three of the Report with reference to the reduction in the premium income, and that was: the directors had refused business because no amount of premium would cover some risks, and the best way was to cut them at once. He would also like to point out that the company's assets were invested in gilt-edged securities, and, like other securities, they had tumbled down; but notwithstanding this fact the funds were in excess of those at the beginning of the year. He was pleased to be able to tell the meeting that a good rebate would be made to those who re-insured. It would be in excess of last year's, and would, he thought, satisfy everybody.

Mr. Lascelles said he had much pleasure in seconding the adoption of the report and balance-sheet.

Colonel Stewart Harrison drew the attention of the meeting to the small percentage of the working expenses and claims to the premium income, and thought great praise was due to the directors for the skill and care they devoted to the interests of the policyholders.

The Chairman having put the vote, the report and accounts were unanimously adopted.

The Chairman said on behalf of the directors and himself that he was very much obliged to Colonel Harrison for his kind words. The Directors devoted an immense amount of time to the management of the Company, and spared no effort to keep the claims and expenses as low as possible. He hoped that during the current year they would be able to obtain a greater amount of new business, and thus spread the expenses over a larger area.

It was resolved that the Directors' fees for the past year be 600*l.*

The following retiring Directors were re-elected :—Mr. J. Stevenson Jones, Liverpool; Mr. Wm. Southern, Manchester; Mr. J. Howard Colls, London; Mr. J. H. Marsden, Bolton; and Mr. Wm. Sapcote, Birmingham; and Mr. Chas. Fox was re-elected auditor.

A hearty vote of thanks was accorded to the Chairman for presiding, and for his services during the past year.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE annual general meeting of this Institution took place on the 25th ult., when the report and balance-sheet for the past year were presented and adopted. Among those present were the outgoing President, Mr. George Appleton; the incoming President, Mr. Fredk. Lionel Dove; the Treasurer, Mr. Edwin Brooks; Messrs. Amphlett, Desch, Gammon, Newling, Oldham, Parker, Stansfeld, and Turpin, members of Committee; and John Austin, Secretary.

The report showed that the income was 607*l.*, and that 580*l.* 5*s.* was paid in pensions and 10*l.* in temporary relief. The pensioners now number twenty-five, the largest number yet on the books at one time. Three orphans are also being maintained and educated in the Orphan Working School, Haverstock Hill, N.W., having been elected to presentations purchased by the Institution.

Mr. Appleton thanked the Committee for their great assistance during his year of office, and informed his successor that the position of President was almost a sinecure.

The Committee, through Mr. Edwin Brooks, complimented Mr. Appleton on his successful year, and heartily thanked him for his kind services; and Mr. Dove acknowledged the honour of election as President, and trusted at the end of the year to have earned the same thanks which had been so gladly given his predecessors.

The motion for alteration of rule limiting the area of benevolence to the Metropolitan district was carried unanimously.

It was announced that the annual dinner would be held at the Holborn Restaurant on April 22.

ASPHALT.—We are asked to mention that the Brunswick Rock Asphalt Paving Co. has been placed on the Admiralty and War Office list of asphalt merchants and paviors.

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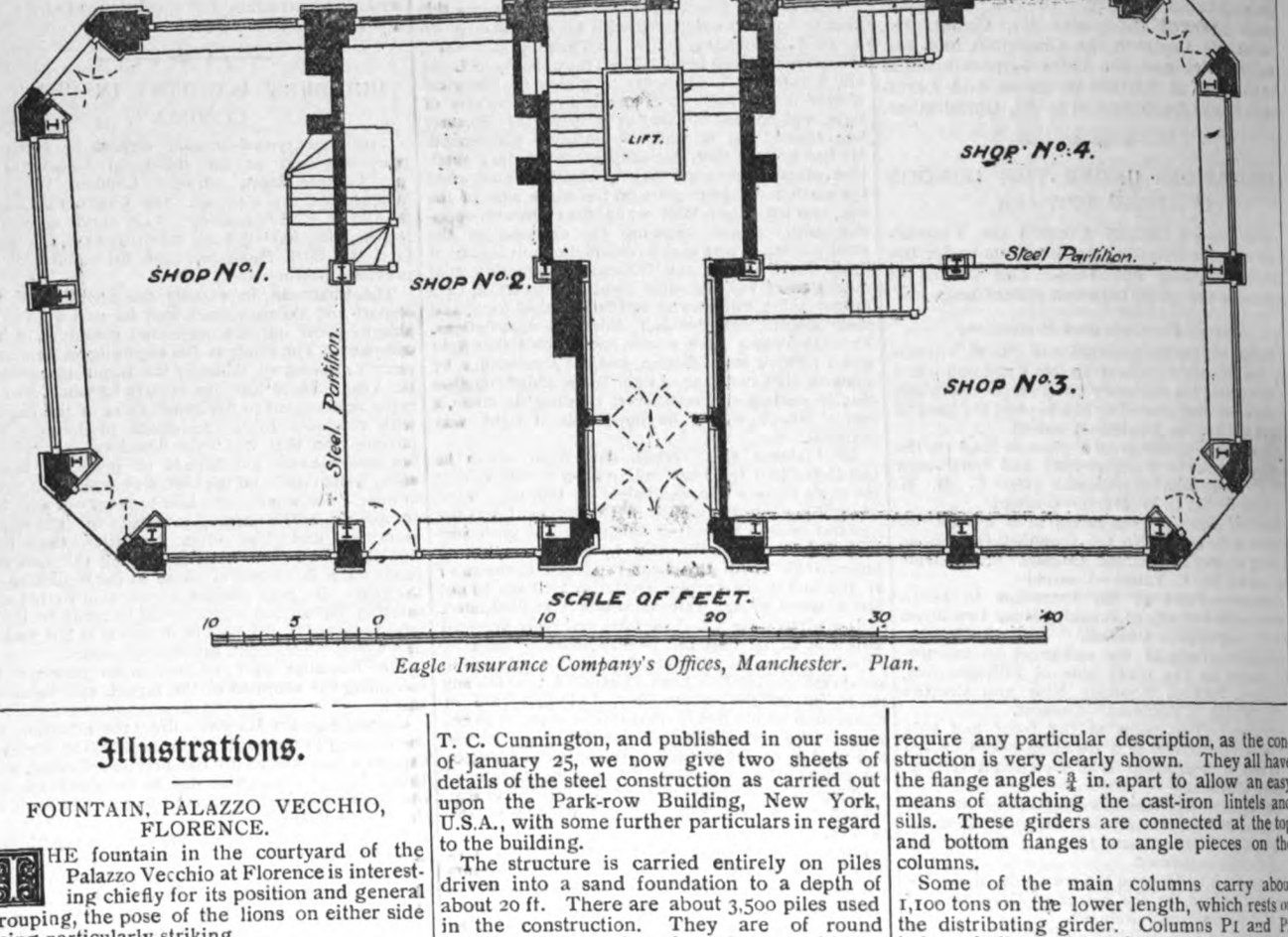

Eagle Insurance Company's Offices, Manchester. Plan.

Illustrations.

FOUNTAIN, PALAZZO VECCHIO, FLORENCE.

THE fountain in the courtyard of the Palazzo Vecchio at Florence is interesting chiefly for its position and general grouping, the pose of the lions on either side being particularly striking.

There are two of these fountains, one on either side of one of the main entrances.

C. W. S.

CHOIR STALLS, SAN GIORGIO MAGGIORE, VENICE.

THE magnificent choir stalls in the Church of S. Giorgio Maggiore, at Venice, are the work of Albert de Brule, a Fleming, and were erected in the year 1598.

The carving is remarkable both for its richness of detail and delicacy of execution and exhibits all the consummate skill in workmanship and design which belongs to that period of Italian architecture. The most interesting portion is the work on the panels at the back of the upper row of stalls, representing scenes in the life of St. Benedict.

The church—one of Palladio's—stands on an island at the eastern point of the Guidecca, and it is from the tower of this church that the best general view of the city of Venice can be obtained.

C. W. S.

EAGLE INSURANCE COMPANY'S NEW PREMISES, MANCHESTER.

THE Eagle Insurance Co. are erecting new premises, as shown by our view, in Cross-street and King-street, Manchester.

The building is being erected in Cullingworth stone from plinth to cornice. The crest of the company, an eagle, surmounts the central pediment in Cross-street. Green slates are to be used. A feature of the exterior is the continuous balcony running above the shop windows, and carrying a wrought-iron railing. There are fireproof floors throughout.

The ground floor is being used for shops only, each of which has a basement connected with it. The first floor is to be chiefly occupied by the premises of the insurance company, and the remainder of that floor and the second and third floors are to be offices for letting.

The architects for the building are Messrs. Chas. Heathcote & Sons, of Manchester, and the contractors are Messrs. Southern & Sons.

STEEL STRUCTURE OF HIGH BUILDINGS IN AMERICA.

IN further reference to the paper on architectural and constructional engineering read before the Architectural Association by Mr. T. C. Cunnington, and published in our issue of January 25, we now give two sheets of details of the steel construction as carried out upon the Park-row Building, New York, U.S.A., with some further particulars in regard to the building.

The structure is carried entirely on piles driven into a sand foundation to a depth of about 20 ft. There are about 3,500 piles used in the construction. They are of round American spruce, free from knots, with the bark left on. They are from 10 in. to 14 in. in diameter at the head, and the load on each does not exceed 16 tons. They are driven at from 16 in. to 18 in. apart, centre to centre, commencing at the centre of each group and working outwards, while the rows are about 24 in. apart, centre to centre. The heads are cut off below the level of ground water, or at 34 ft. 4 in. below the level of the kerb in Park-row. From 12 in. to 16 in. is excavated around the head of each pile, which space is filled in with concrete, composed of 1 part Portland cement, 2 parts sand, and 5 parts broken stone, not more than 2½ in. cube. The concrete is levelled up flush with the heads of the piles. Upon the top of the concrete are laid granite blocks to receive the brick footings which carry the grillage beams, as shown. Most of the columns rest on distributing girders, each girder carrying, as a rule, two columns, though in one case there are as many as four columns on one girder.

A typical distributing girder is shown in detail No. 1 (Sheet I.), together with the grillage beams and granite coping blocks underneath them. This girder supports columns P1 and P2, each of which carries about 1,100 tons, so that the girder itself sustains a load of about 2,200 tons. It is 26 ft. long and 8 ft. deep, and has four web plates, each ⅜ in. thick. There are four angles, 6 in. by 6 in. by ⅝ in. on each flange, together with six flange plates (three top and three bottom), each 2 ft. 8 in. wide by ¾ in. thick. The girder is carried upon thirty-five steel joists, 12 in. deep by 5 ft. long, which are separated by distance pieces. In the foundation in question there are four of these distance pieces between every two beams, but in some of the foundations, where the length of the beam is 6 ft., there are six distance pieces between every two beams. The distance pieces are box-shaped, and have milled surfaces which bear evenly on the top and bottom flange of the beams. The grillage beams rest on the top of the granite caps and are bedded on cement. Box and lattice girders are used for connecting the columns at the walls, and they are attached to the columns in such a way as to make the connexions as stiff as possible in order that they may do service as vertical wind bracing. Great lateral stiffness is given to the building in this way.

One of the typical lattice girders is shown in detail No. 3 (Sheet IV.), but it does not require any particular description, as the construction is very clearly shown. They all have the flange angles ¾ in. apart to allow an easy means of attaching the cast-iron lintels and sills. These girders are connected at the top and bottom flanges to angle pieces on the columns.

Some of the main columns carry about 1,100 tons on the lower length, which rests on the distributing girder. Columns P1 and P2 being similar, column P1 has been taken as descriptive of both. The columns, detail drawing No. 4, are of box construction, and are built up of plates and angles and strengthened according to the load they have to carry by the addition of plates, as shown in the cross sections on drawing. This forms a simple and efficient means of varying the sectional area of the column without materially altering its radius of gyration, and enables a great number of plates of one standard size to be used in different columns, thus reducing very materially the cost of manufacture. The bottom length of the column, where it rests on the distributing girder, has a flange plate at right angles to its axis, which plate is securely riveted to the body of the column with angles by means of a double line of rivets; while at its upper end, where the next column length rests, it has angles forming a flange, but no plate.

The ends of the two lengths of columns are faced, so that they bear truly one on the other, and are riveted together through each angle. In addition to this there are two splice plates, one on each side of the column, as shown. These plates are firmly riveted to the lower length of column in the shops, but the part projecting above the top is riveted to its next length of column above when erected on the site of the building. These rivets pass through the splice plates and the sides of the column. This forms a very strong joint, and is preferable to the method of fixing by means of the angles alone, as it makes the whole column much stiffer and better able to resist the side stresses due to wind. It will be seen that this way of jointing the different lengths of the column is adopted from the bottom to the top, so that the combined lengths are formed into one united whole, which extends from the cellar to the roof.

The method of carrying and fixing the box and lattice girders, which carry the walls and also the floor girders, is clearly shown in detail at D, &c., on Sheet IV. For example, angle brackets are riveted to the body of the column in order to support the ends of the girder where they abut against the plates. These brackets are stiffened by vertical angles which bear up against their underside, and thus form a very strong support. There is also an angle bracket riveted to the side of the column some distance above the lower one, and in an inverted position in regard to the latter. The distance between these angles is

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equal to the depth of the girder, which abuts against the column at this point, and when the girder is in position its upper flange is riveted to the upper angle in such a way as to add lateral stiffness to the building. In some of the other lengths of columns the brackets which carry the girders are formed of plates as well as angles, but in almost every case the girders are riveted through the upper flange to angle brackets on the columns.

All the abutting surfaces of the columns are planed to an even bearing.

Books.

Laxton's Builders' Price Book for 1902. Eighty-fifth Edition. London: Kelly's Directories, Limited, 182, 183, and 184, High Holborn, W.C.

AFTER an existence of eighty-five years this work must command our respect, if only for its age; but in addition to this claim on the score of age, it is also satisfactory to note that in its later years it has much improved both in size and quality. How much this is due to the severe competition of its younger contemporaries it would be unkind to suggest. Still, the fact remains that the edition now before us well sustains its character, and justifies its existence as far as it is possible for a price book to do so. The uneventful year that has just passed has made necessary no very marked revision in the prices, but we are pleased to see that what was necessary has been done with care and discretion. We have tested sundry of the prices taken haphazard from different trades, and find that on the whole they present a fair average, although it is difficult to start with a definite standard, "circumstances" in this connexion "altering cases" to a very great extent.

The "Adaptation of a Price Book to Varying Rate of Wages" has served through two rises in wages after it was first written, to the utter confusion of anybody attempting to use it. We have called attention to this in previous reviews. It may not be a very important chapter, but if it is to be inserted at all, it should at least be correct. However, it would not be a severe loss to the book if the "Examples" were omitted altogether, as *without* these the method would be perfectly obvious to any one with a spark of intelligence.

Bermondsey: its Historic Memories and Associations. By EDWARD T. CLARKE. London: Elliot Stock. 1902.

THIS volume forms a cheap edition of an interesting work, of which the first eight chapters (one half of the book) relate to "Monastic Bermondsey," the remaining four chapters being devoted to the story of "Bermondsey House and its occupants," and an account of the locality in more modern times. Whilst treating his theme in a painstaking though somewhat discursive manner, the author has not failed to consult several local authorities—including Mr. G. W. Phillips, Dr. Rendle, Mrs. Boger, and others—and gives copious extracts from their writings.

The Domesday Survey cites Bermondsey, in Brixton hundred, as held by the King, and before him by Earl Harold, and mentions its new and handsome church. The Abbey of the Holy Saviour had its origin in a priory founded in 1082 for a band of Benedictine monks, brought from Cluny, upon whom Aylwin Child bestowed some rents in the City of London, in addition to the Cowyk, or Quickbury, manor given by Richard, who is described as brother of Gundred, daughter of the Conqueror and wife of William de Warenne. King William II. surrendered to the priory his Royal manor there; other benefactions quickly followed, and at Richard II.'s request Pope Boniface IX. erected (1399) the priory into an abbey, which under favour of succeeding sovereigns attained to great wealth and importance. In later years, however, the revenues declined, and at the surrender in 1537 of Abbot Wharton the official valuation computed the income of the abbey to be 474*l.* 14s. 4d., though Burnet in his "History of the Reformation" says, "It was valued at 548*l.*, and so fell not within the Act." Sir Thomas Pope, who, by the way, received the surrender of St. Albans, but saved that abbey church from being pulled down, held the lucrative office of Treasurer of the Court of Augmentations. To him and his wife, on August 30, 1541, Sir Robert Southwell, Master of the Rolls, to whom the site of the abbey had been granted on July 8 of that same year, conveyed the property in fee, under a sale afterwards confirmed by letters patent. Thereupon Pope proceeded to pull down the church and most of the conventual buildings, and with the materials built for himself a house which with its gardens, orchards, pasture land, ponds, and so on, covered about twenty acres. On the other hand he applied a portion of his gains to the building and endowment of Trinity College, Oxford. After Pope's death at Clerkenwell Priory, in 1559, his property in Bermondsey was acquired by Thomas Ratcliffe, Earl of Sussex, and Lord Chamberlain, who lived there in great state. He had been the faithful servant of the Queen, and she visited him there a few days before he died on June 9, 1593; his widow, Frances, a daughter of Sir William Sidney, founded Sidney Sussex College, Cambridge.

We will now turn to what constitutes a pleasing feature of Mr. Clarke's work—the numerous and well-chosen illustrations, some of them being reproductions from the views and plans in Wilkinson's "Londina Illustrata." The manor house, it is true, quickly disappeared; its site, however, is yet clearly represented by Bermondsey-square, corresponding with the former great court of the abbey. To the east is Long-walk, over part of which, and of the ground bounded by Grange-walk on the south, stood a palace of King William I., his successor, and our earlier Plantagenet kings. Until 1805 remained the North Gate, together with adjoining portions of the monastic buildings, and a view is also given of the West Gate as it appeared in 1777. The situations of the gates, and of the abbey church, are plotted in the ground plan, made in 1679, and published by Wilkinson in 1822. There are views, too, of the hall, and other parts of the manor-house built by Pope, showing details after the Tudor style; Jamaica House, at the end of Cherry Garden-street; the Parish Church of St. Mary Magdalen (rebuilt in 1680 and restored by G. Porter in 1830); and various modern public buildings the architects of which are not named. Mr. Clarke supplies an index.

The Pavement Masters of Siena (1369-1562). By ROBERT H. HOBART CUST, M.A. George Bell & Sons.

THIS book will be found a useful guide by those who, having the opportunity, have also the patience, to study the pavement of Siena Cathedral. Considered in relation to the great building, as a part only of a whole, and as a part also where subordination is demanded rather than emphasis, the pavement is a discord. The attention of the spectator is arrested and his sense of architectural values dissipated, by this dominant note beneath his feet.

Eager in display, and reckless of purpose, nothing illustrates more clearly the entanglements into which the Italian Renaissance was hurried. Yet the pavement is of unquestioned interest as a historical relic, and possesses all the ingenuity, and some of the charm, of the period to which it belongs. So far, therefore, it is not unworthy of the labour which Mr. Cust has expended upon its analysis.

Sanitary Engineering: A Practical Manual of Town Drainage and Sewage and Refuse Disposal. By FRANCIS WOOD, A.M.Inst.C.E., Borough Surveyor of Fulham. London: Charles Griffin & Co., Ltd. 1902.

THIS work is the latest addition to the series known as "Griffin's Scientific Text-Books." The author claims to "have commented upon many subjects in . . . . an original manner," and we have no hesitation in allowing the claim, but we are hardly disposed to admit that all his "opinions and criticisms" are "the outcome of the most careful and deliberate inquiry and thought." In Article 218 it is written: "There are other cases where the outlet is into the sea at a point just below the low water level. In these the sewage has to be retained in a chamber during the period the tide is coming in . . . . some six and a half hours. It will, therefore, be seen that the sewage only flows on and during the ebb-tide." In the next article the author proceeds "in an original manner" to suggest that, instead of the chamber, a coil of sewers might be constructed at one side of the outlet sewer. A diagram is given in illustration of this suggestion, and, if it were called an elevation instead of a plan, it would serve equally well as an illustration of a coil of heating pipes on the one-pipe system. The main is lettered D A B C; at A is the branch for the coil E F G H, which returns to the main at the point B. The author's description can now be understood. "When the tide begins to flow, the sewage is turned into the sewer A E F G H, and by the time it reaches B the tide is on the ebb. . . . This sewer might be made with such an inclination as would keep it self-cleansing." If this suggestion is "the outcome of the most careful and deliberate inquiry and thought," then a little less care and deliberation would probably give better results. With a sewage-velocity of 2 ft. per second—the smallest allowed by the author in Art. 146—the length of the coil of sewers would have to be nearly *nine miles* in order that 6½ hours might be occupied by the flow from A to B!

Nearly five years ago Mr. Wood contributed an article to an engineering paper; for his own sake, he ought to have left it there. It bristles with errors, as the author himself will find by checking the calculations on pp. 175-6. Perhaps the following equation may be of service:—Let x = discharge of sewage in gallons, containing 1·5 grains of albuminoid ammonia per gallon, y = discharge of river in gallons, containing ·01 grain of alb. ammonia per gallon, and let it be required to find the proportions in which x and y must be mixed in order to obtain a liquid containing .04 grain of alb. ammonia per gallon,—then $(x \times 1{\cdot}5) + (y \times {\cdot}01) = (x + y) \times {\cdot}04$. From this we find that $y = 48{\cdot}6\ x$, a very different result from that obtained by Mr. Wood. This, however, is only one of the errors in this series of calculations.

We can now, without fear of offending our architectural readers, quote Mr. Wood's opinions about them: "Architects, as a rule, have no special knowledge as to drainage matters, so that it is better that he [*sic*] should confine himself to laying out the estate from a commercial standpoint, and put the drainage operations into the hands of the competent civil engineer who is acting for the local authority. The author has, in many cases, suggested new routes for the sewers, better inclinations, altered the dimensions, given details of manholes and lampholes, corrected specifications," &c. Exactly. Architects are under the thumbs of these competent civil engineers acting for the local authority, and must do as they are told, not as they think best. Imagine two main parallel streets with cross streets running from one to the other. In a certain town, engineer the first required the sewers in the cross streets to commence at the building line of the upper main street; engineer the second insisted on these sewers commencing in the sewer manholes in the upper main street, in order to promote a circulation of air throughout the sewerage system; engineer the third would have none of this, and suggested that the sewers in the cross streets should commence 12 ft. from the upper main street. The architects did as they were ordered—"for sufferance is the badge of all our tribe."

As Mr. Wood has made so many valuable alterations in architects' plans, we hoped to learn a great deal from his chapter on house-drainage, but our hopes were soon dashed to the ground. On page 51, he gives the drainage plan of a row of houses; the basements of three houses have gullies in the centre, and drains from them are laid under the floors to a double junction under the middle house, whence a single drain or "sewer" (without intercepting trap) is laid to the main sewer in the street.

Mr. Wood has succeeded in gathering together a great amount of useful information on sanitary engineering; the reader will find chapters on hydraulics, retaining walls, house and land drainage, sewers, sewage pumping, trade refuse, sewage disposal, refuse destructors, and other branches of the subject, but the work is marred by printer's and author's errors, and cannot be regarded as a "text-book" for students, although older practitioners will doubtless find it suggestive and useful for reference. There is a good index, and the work contains 181 illustrations.

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Well-Boring for Water, Brine, and Oil: a Manual of Current Practice. By C. ISLER, Hydraulic Engineer. London: E. & F. N. Spon. 1902.

NOTWITHSTANDING the remarkable activity displayed by public bodies in all parts of the country for the improvement of water supplies, the demand for private sources of supply seems to show no signs of diminution. Deep wells, of the kind with which Mr. Isler is professionally associated, are increasingly popular amongst various classes of the community, because they afford ample and pure supplies at a minimum cost. Local Authorities and water companies are largely dependent upon wells to enable them to meet the requirements of consumers, public institutions are very frequently supplied by wells on their grounds, and in many country houses and industrial establishments the adoption of deep wells is practically indispensible. The architect, whose reputation for encyclopædic knowledge still remains, has naturally a good deal to do with well-boring. To him, therefore, Mr. Isler's book will be welcome; and doubly so because it is written by a practical expert.

In the first chapter the author discusses a few necessary "geological considerations" with commendable brevity, and in the second he disposes of "dug wells" within the limits of five pages. With his remark that no regret need follow the gradual dying out of the "sunk" well we quite agree. Indeed, what we have to regret is that so many of them remain in country districts for the distribution of diluted manure, sewage, and graveyard products under the guise of drinking water. After the above preliminaries are dismissed, the author settles down to his own special subject. The simplest and cheapest type of well is that formed by the driven tube. It is particularly suitable for depths of from 50 to 100 ft., in strata not composed of actual rock. As a general rule, the water rises to within "lifting" distance of the pump, but sometimes it becomes necessary to drive a larger tube well, sinking the working barrel of the pump to the proper depth. In other cases, the tube is driven from the bottom of an old dug well, thus enabling the owner to discontinue a polluted for a pure source of supply. The descriptions and illustrations given by Mr. Isler form a serviceable guide to the successful making of driven tube-wells to suit all these cases. The succeeding chapter, dealing with "bored tube-wells," contains over thirty illustrations of well-boring tools, as well as several diagrams showing different arrangements of plant required for work of the kind. The well-borer is a man of infinite patience, and his mechanical equipment resembles that of the dentist in variety. He selects one instrument for clays, another for gravels, others for solid strata; he has circular chisels for trimming the hole true and vertical, spring chisels for enlarging bore-holes below the pipes, shells for extracting débris, worm-nose shells for loose soils, water shells for preparatory testing, and a variety of auxiliary appliances. He provides a crow's-foot for recovering broken rods, a bellbox for recovering rods when the top joint is left on, a worm for recovering broken tools, and expanding tools for the extraction of broken or faulty pipes. Armed with these aids, and the faculty of discovering from almost imperceptible signs what is going on out of sight far below the surface, the well-borer carries out his operations with imperturbable perseverance. Down below things do not always go on happily, for in addition to the mishaps suggested in the preceding paragraph, various hindrances are to be expected unless the most watchful care be exercised. The author does not express the difficulties of well-boring in any direct way, but they may be inferred from his eminently practical exposition of the operations involved. The chapter concludes with approximate prices for borings in different kinds of soil, and for sets of tools for borings up to 500 ft. in depth. Some interesting particulars of the Kind-Chaudron system—a modification of that employed in connexion with the well-known Passy well—are contained in Chapter V., and other chapters are occupied with the Dru and the Mather & Platt deep boring systems, the American rope-boring system, and deep boring with diamond drills. The volume concludes with an account of methods of raising water, and we are glad to see that due prominence is given to the "air-lift" system, a method extensively used in the United States, coming rapidly into use on the Continent, but, as too often happens, comparatively unknown in this country. Our readers may therefore be the more interested in the description of the air-lift installation at Hyde Park-court, Knightsbridge.

Mr. Isler's little book may incidentally bring his own firm into prominence, but it is written in thoroughly impartial style, and quite deserves its title as "a manual of current practice."

Redgrave's Factory Acts: The Factory Acts, by the late Alexander Redgrave, C.B. Eighth Edition, by H. S. SCRIVENER and C. F. LLOYD, Barristers. London: Shaw & Sons, and Butterworth & Co. 1902.

REDGRAVE'S Factory Acts has long been a well-known work, and probably the editors of this edition are wise in retaining the old title. But the important Factory and Workshops Act, 1901, has so altered the form of the law and added so many details that this is practically a new work. The editors have carried out their work with care and skill, and unquestionably the book will retain its old reputation. The attention of our readers should be specially directed to Section 105, which contains the application of certain provisions to buildings, and re-enacts so much of Section 23 of the Act of 1895 as relates to buildings.

The Law Relating to Factories and Workshops, and the Factory and Workshop Act, 1901. With Appendix. By EVANS AUSTIN, M.A., Barrister. Second Edition. London: Knight & Co. 1901.

THIS is a work of the same kind as that of Redgrave; it is, however, not quite so handy in form or quite so full in notes. It is, however, a good, serviceable book. As the price is not stated, either on the book or by the publishers, we cannot say if it is cheaper than its friendly rival. We are surprised that publishers of editions of important and lengthy statutes do not give some means for a purchaser to note up his book, either by some blank pages or extra large margins. In this latter respect it is right to say that the book is better than many.

The "Electrician" Wireman's Pocket-Book. Edited by F. C. RAPHAEL, A.M.I.E.E. London: The "Electrician" Publishing Co., Ltd. 1902.

THIS pocket-book is of a very convenient size, and contains those tables, instructions, and diagrams which are almost indispensable to the electrician. With the exception of the sections on underground lines and house-wiring estimates there is nothing very novel in the work. The editing has been extremely well done, and we think that no one engaged in the electrical industry will regret purchasing this work. All the tables are up to date, and nearly all the methods given are those practically employed by the best firms.

TRADE CATALOGUES.

MESSRS. MOFFATT & EASTMEAD, of London, send us a copy of their catalogue of lifts, hoists, cranes, &c., for various purposes. A special feature to which attention is directed in the catalogue, is that all the elevators, lifts, and hoists designed by the firm are fitted with safety self-sustaining shafts. There are several useful sectional drawings of buildings, showing different methods of applying electric and hydraulic passenger and goods lifts.

The Farnley Iron Co., of Leeds, send us a very interesting and well illustrated *brochure*, entitled "Farnley Iron Described," and at the end a price list of plates, bars, &c., is loosely inserted. People of the present day, who live in what is frequently called the "steel age," are sometimes tempted to forget that puddled iron is still in request for various industrial purposes. Being makers of Yorkshire iron, and not makers of steel, the Farnley Co. is naturally interested in drawing attention to the special advantages possessed by puddled iron for work in which forging and welding are necessary, but the facts adduced in the book are fairly put, and deserve consideration.

The Foster Engineering Co., of Newark, U.S.A., send us their catalogue of reducing valves and other specialties for steam, water, gas, or air. The Foster reducing valve has already been popularised in this country by the agency of a well-known engineering firm in the North, and it is generally accepted as being one of the most reliable appliances of its kind. The catalogue now before us sets forth in the lucid, and effective style so thoroughly understood in the "States," a great variety of the uses to which the Foster specialties may be put. Prices are quoted in most cases, but it is rather a drawback that no address in Great Britain is given whence the goods may be obtained.

The United Telferage Company of New York send us a series of circulars relating to their automatic electric conveyors. As many of our readers are aware, a similar system has been in operation for many years in the Victoria Station, Manchester, for the transportation of luggage and parcels from one platform to another. The apparatus is really of unlimited application, and the circulars we have received illustrate its uses in many different industries, and notably in the transportation and distribution of building materials and constructional supplies.

Messrs. Herbert Morris & Bastert, of Loughborough, send us their list of hand overhead travelling cranes. These are illustrated in many different sizes, and the special aim of the firm is to make cranes in quantities of fifty to a hundred at a time with the objects of giving good value and of ensuring prompt delivery. Further it is stated that from 300 to 400 cranes are always kept in stock. This way of doing business is certainly commendable.

Messrs. Hobbs, Hart, & Co., of London, send us their price-list of safes, doors, cash and deed boxes—a volume of about ninety pages. Amongst safes illustrated, the "sectional" type is the most noteworthy, as the method of construction makes it possible for large safes to be erected in positions to which those of the ordinary kind could not be conveyed. The sections of the list devoted to strong rooms and party-wall doors are of special interest to architects.

The General Electric Co., of London, send us their list of enamelled steel conduits for wiring buildings. These conduits are produced on the "Union" system, and are of several varieties with close brazed and welded joints of both light and heavy gauges, the latter being screwed with gas thread. The "Papristeel" conduit, of light gauge, but with an impervious lining, is recommended for damp positions. The list also includes particulars of junction boxes and kindred fittings.

BOOKS RECEIVED.

PROCEEDINGS OF THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS. Vol. XXVII. Edited by Thomas Cole. (E. and F. N. Spon.)

PATENTS FOR INVENTIONS AND HOW TO PROCURE THEM. By G. G. M. Hardingham. Second Edition. (Crosby Lockwood & Son.)

INDUSTRIAL DEMOCRACY. By Sidney and Beatrice Webb. New Edition. Two volumes in one. (Longmans.)

SCHOOL ARCHITECTURE. By Edmund March Wheelwright. (Rogers & Manson, Boston, U.S.A. 218.)

Correspondence.

CHELSEA BATHS COMPETITION.

SIR,—We desire to enter a protest against the decision of the Chelsea Council to alter the award made by Mr. R. Norman Shaw, R.A., in this competition, and place the designs Nos. 21 and 45 in different relative positions of merit.

We have seen the exhibition of drawings, and we consider that the award of Mr. Norman Shaw, placing the design No. 21 first, was an eminently fair one and which we could heartily endorse.

We are further of opinion that the design No. 45 was quite unworthy of the first place.

HENRY T. HARE.
LANCHESTER, STEWART, & RICKARDS.

COMPETITIONS.

SIR,—Mr. Sidney Smith, the assessor for the Hull Art School competition, has certainly a claim to the gratitude of all those who competed for having endeavoured to reduce their labours to a minimum; or at least to such a minimum as the unfortunate conditions that now govern competitions allowed of.

Nevertheless, although the work is quoted as having been reduced to the smallest possible

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amount, competitors had to provide complete plans, *four* elevations, and a ½-in. detail drawing of a portion of the elevation.

True, the drawings could be rough; but does the saving between this and careful work amount to very much after all? Has not the time really arrived when for technical subjects at all events—I do not say monumental work—complete plans in pencil would suffice for the preliminary stage? Among such technical subjects I include baths, libraries, schools—art, board, and technical—hospitals, and even in some cases municipal buildings.

If plans only were submitted, as I suggest, for a preliminary competition, the six best could then be asked to further develop their scheme, and the unsuccessful majority thus saved endless time and labour; labour, too, which in many cases is, I fear, totally misapplied from the first.

The objection may be urged that plans might be selected that, although good in themselves, would be hopeless from an elevational point of view. But a competitor would naturally assure himself of the possibilities that his scheme afforded for proper treatment, before submitting it, and yet at the same time be saved the labour of the reproduction, or at all events until there was at least some hope of his efforts being crowned with success. Would not again such a method really be a stimulus for obtaining better results in the end?

I should like to see some strong assessor urge upon his committee the desirability of giving a trial to the system I have thus roughly mapped out.

If by proving successful it so became general, he would, I am sure, have earned the thanks of the ever increasing number to whom the gamble of a competition—for it is often really nothing more—will always prove attractive, and yet often enough so very disappointing.

H. LIONEL THORNELY.

Manchester.

SIR,—I am sure that Mr. Sidney R. J. Smith's letter, published in your number of the 22nd ult, has been read with pleasure by members of the profession.

In the interests of both committees and competitors it is to be hoped that the time is not far distant when committees will, in every instance, stipulate in their conditions that only pencil sketches will be required. This would afford the competitor more time to submit to a committee, in many instances, a much better thought out set of drawings than if he had been asked for inked-in and finished drawings, which are only treated as preliminary sketches.

If I may, I would suggest that the various drawings to be submitted should be mounted upon strong cardboard mounts, which would be quite as suitable as having them mounted on stretchers. This would tend to expedite matters considerably, when the saving of time is important, and would also curtail somewhat the competitor's expenses.

ARCHITECT.

SIR,—You have published some reflections by a non-competitor and by an assessor. As an occasional competitor, may I offer a few remarks?

I fully agree with "Assessor" that in most cases perspectives should be prohibited, but consider that when a competition is limited, and each competitor receives an honorarium, they might well be made obligatory. When the new building will materially affect the appearance of an important existing building, or when the assessor feels any doubts as to the satisfactory result likely to be produced by any particular designs, why should not *he* have some rough perspectives made before making his final award?

Mr. Smith suggests that time can be saved for competitors by not allowing the drawings to be inked in. I believe the difficulty of keeping the drawings clean and fresh fully counterbalances any advantage there may be in the apparent saving of labour.

Considering the time and trouble competitors cheerfully devote to their work—in most cases equivalent to buying a very expensive ticket for a lottery in which the prizes are exceptionally few—I think assessors might see that they are furnished with illustrations of the premiated designs, accompanied by a copy of the assessor's report, or part of it, and possibly some critical remarks, which could not fail to be beneficial to at least the "75 per cent." referred to by Mr. Smith.

Finally, may I implore any assessor who may read this to be most careful not to ask for too much for the money? They usually do!

OCCASIONAL COMPETITOR.

*** It is not generally the assessor who "asks for too much for the money," but the promoters of the competition. The assessor not infrequently has the duty of telling them that the building cannot be properly carried out for the sum they propose.—ED.

A COMPETITION DREAM.

SIR,—The letter of "Non-Competitor" in your journal of the 15th ult. was followed by a "dream," but after the assessor's thoughtful and sympathetic letter in last week's issue, perhaps it is a little hard to tell it to the public. However, here it is. I dreamed that the eighty-seven architects previously alluded to received an invitation to compete for another 12,000*l.* building. Each competitor was asked to pay 20*l.* down for the "conditions," which considerately stated that no work of any kind would be required from the competitors, and that the entrance fees, amounting to 1,740*l.*, would all be returned in prizes. Needless to say, all the invitations were joyfully responded to, on the chance of getting one of the prizes, which consisted of a first prize of 600*l.*, a second of 500*l.*, a third of 400*l.*, and a fourth of 200*l.*, leaving still 40*l.* (out of the 1,740*l.*) which would be devoted to a grand combination dinner. At this, the committee, the assessor, and all the competitors would take part; the appointment of architect for the building would be made, and the four "consolation" prizes awarded. To ensure everything being satisfactorily settled, all the competitors, after dinner, were to be allowed to hand in their votes, and the committee and assessor, who would be present, would hold in hand a sufficient number of votes to settle everything to the satisfaction of all concerned. What a popular competition this was going to be! There were no expenses except the entrance fee for conditions; no work to do for it, and consequently no interference with the ordinary office work, and cash prizes of far more value than would accrue to the competitor who should prove successful in being appointed for the work. For the latter, indeed, some sympathetic expressions were distinctly heard, as would he not have a couple of years of work before him ere he got his reward?

The day for the dinner arrived. All were in the best of humour; and the writer was about to congratulate and compliment both the committee and competitors on the novelty and unqualified success of the competition, when, unfortunately, he awoke, and found it was only a dream.

NON-COMPETITOR.

A CURIOSITY IN TENDERS.

SIR,—The following result of tenders received for the erection of a shop at Wealdstone for a client of ours we think is somewhat unique, and more particularly so as no quantities were supplied to the builders.

The tenders were as follows:—

C. Simons, Harlesden	£650
J. & J. Bailey, Wealdstone	650
M. Dymock, Wealdstone	650

We think this result might be of interest to your readers.

CLARKE & CHARLES.

Harrow, February 24.

QUANTITIES SUPPLIED *v.* QUANTITIES NOT SUPPLIED.

SIR,—As some architects' clients think that quantities are an unnecessary and useless expense, the following experience, which recently occurred in connexion with my own practice, may prove of interest.

On the same estate in the suburbs, about seven miles from London, two jobs were tendered for within a few months of each other.

In the first case, the client thought he would obtain lump sum tenders from the drawings and specification, and save the expense of preparing quantities. He did so, and his two houses cost about 5,500*l.*, which worked out at 9½d. per cubic foot.

In the second case, quantities were supplied for one house, costing about 3,000*l.*, which price worked out at a small fraction over 8d. per cubic foot, including the cost of the quantities.

The difference in prices of materials at the two periods when tenders were obtained was so slight as to be a negligeable quantity; therefore, the saving effected by supplying the contractors with bills of quantities amounted to at least 15 per cent.

The client who thought he was saving the expense of quantities, amounting to about 160*l.*, lost 615*l.* by obtaining tenders without them. In the second case the client saved about 450*l.*

The two jobs afford a fair ground of comparison, the same general specification being used, and the detail of the work being very similar in all respects.

The quantities were not supplied by the architect, but by a quantity surveyor, and everything was thoroughly gone into in accordance with the best London practice, so that the contractor was enabled to see exactly what was required of him.

I am quite ready to admit that quantities (so-called), as sometimes supplied to contractors, undoubtedly have the effect of increasing the cost of the work.

As an instance, I may mention a bill of quantities (?) only *seven* pages long for a rather elaborate job, the tenders varying 100 per cent. from about 3,500*l.* to 7,000*l.* Properly gone into, this bill of quantities should have been over 100 pages long.

In a case such as this, particularly when the quantities contain a clause throwing the unfair onus on the contractor of checking them, undoubtedly all the contractors feel very uncertain of their whereabouts, and *all* price the few items given them more than sufficiently high to cover the items which the quantities should contain but do not, thereby running up the cost of the work.

Still, I think the instance I have given shows conclusively that it is greatly to the client's interest to have properly-prepared quantities supplied to the contractors.

ALEXANDER H. KINDER.

The Student's Column.

PART II.—DRAINAGE.

CHAPTER 8.—STONEWARE DRAIN-PIPES.

STONEWARE AND IRON PIPES.—The Model By-laws (both urban and rural) specify that sewage-drains must be of "good sound pipes formed of glazed stoneware, or of other equally suitable material." In the new Drainage By-laws of the London County Council the words "or of cast iron" are inserted after "stoneware"; otherwise the general description remains the same. Detailed particulars are, however, given in the London By-laws regarding stoneware and cast iron pipes, and the absence of further mention of any "other equally suitable material" may be regarded as presumptive evidence that these are the only materials which are at present considered satisfactory. The respective merits of the two materials have been often discussed; some years ago stoneware had the best of the argument, but the pendulum seems now to be swinging in the other direction. The two principal objections to cast iron have been cost and corrosion. The extra cost will, however, in many cases be a mere trifle in comparison with the total cost of a building, but if cast-iron pipes are not only more costly, but also less durable, the question assumes a different aspect. Various methods of coating iron pipes in order to prevent corrosion have been tried, but it cannot be said that any one of them is entirely successful; at the best, corrosion is only delayed and not altogether prevented. On the other hand, iron pipes are stronger than stoneware and require fewer joints, the latter being an important advantage, as every joint in a drain is a possible source of leakage and obstruction.

Shape.—Drain-pipes are usually circular in cross-section. Theoretically the egg-shaped pipe is better, as a greater depth of flow is obtained with the same quantity of sewage, but the practical difficulties in the way of laying such pipes have prevented their general adoption. Plummer's drain-pipe (fig. 5) is a modified form introduced a few years ago, and has proved very satisfactory under experimental tests and in actual working. The illustration shows the spigot end of a 6-in. pipe fitted into the socket of the next pipe. The invert is formed to a 1½-in. radius. The exterior of the socket is circular, but with a flat base, and the interior is shaped somewhat like the spigot, in order to ensure the proper position and alignment of the inverts.

Varieties.—The term "stoneware" is sometimes restricted to ware manufactured from a mixture consisting chiefly of clays of the Lias formation, but it is doubtful whether this is the meaning intended to be conveyed by the Model By-laws. Local Authorities, for example, in Lancashire and the West Riding of Yorkshire do not prohibit the use of pipes made from the local fireclays, although such pipes are not generally known as "stoneware." The quality of drain-pipes depends to a very large extent upon the nature of the clays used in their manufacture. It is generally considered that the Lias clays, such as those obtained at Poole, in Dorsetshire, and Teignmouth, in Devonshire, give the best results. A common rule is that the walls of pipes, 6 in. in diameter and upwards, made from these clays may have a thickness equal to one-twelfth of the internal diameter of the pipe, while the thickness of the walls of fireclay pipes must be one-tenth of the diameter. Pipes made from clays containing an excess of lime may appear thoroughly sound, but are apt to "rot" under the influence of ground-water and sewage. The colour of drain-pipes varies according to the composition of the clay and the degree of burning, and may be pale buff, light or dark red, bluish grey, brown, or dark blue or purple. Fireclay pipes have a somewhat porous body, and their imperviousness depends, therefore, to a large extent on the perfection of the glaze; true stoneware is semi-vitrified throughout.

Drain-pipes are also made from the clays which produce the well-known Staffordshire blue bricks, and are sometimes sold as "blue

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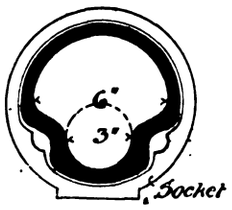

Fig. 5.

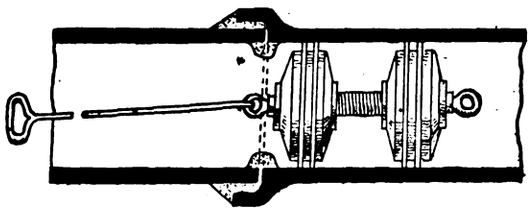

Fig. 6.

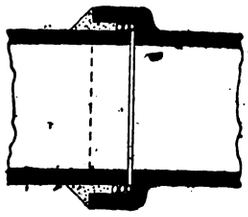

Fig. 7.

clay" or "ironware" pipes. They are strong and dense, and are supplied in sizes from 3 in. to 42 in. in diameter.

Burnt-clay pipes ought to be *strong*, so as to resist shocks during transit and the crushing and bursting stresses to which they may afterwards be subjected; *impervious*, so that the sewage will not percolate into or through them; *hard and tough*, so that they will resist the abrading action of the sewage; *smooth*, so that the flow of sewage will not be retarded; *true*, so that they can be laid in right lines and to uniform gradients; and finally, they must be so designed as to permit of the joints between the pipes being made thoroughly watertight.

Nearly all manufacturers now supply what are known as "tested" pipes, but as the nature of the tests is not generally stated, the designation is very indefinite. Indeed, many of these pipes have the word "tested" impressed on them, and as the impression can only be made before they are burnt, it is obvious that many pipes bearing the word must be of inferior quality. Pipes sold as "tested" may, however, be regarded as specially selected, and ought to be perfect in shape and glaze and thoroughly sound. The work of supervision is much simplified when such pipes are specified, as only those actually damaged in transit have, as a rule, to be rejected.

Strength, &c.—"Granitic stoneware" pipes made at Woodville, near Burton-on-Trent, have been tested with the following results:—

Diameter in inches.	Bursting Pressure in lbs. per square inch.					Crushing Strength in lbs.				
	1	2	3	4	Average.	1	2	3	4	Average.
4	200	200	192	200	198	4,000	4,250	3,600	4,500	4,087
6	200	169	151	200	180	3,550	4,750	3,500	4,000	3,950
9	136	141	194	177	162	5,100	4,250	4,150	4,050	4,388

The hydraulic testing machine used in the bursting tests did not register beyond a pressure of 200 lbs., and the average resistance of the 4-in. and 6-in. pipes was therefore higher than stated in the table. Three tests of 6 in. "ironware" pipes with ¾-in. shells showed an average bursting pressure of 241 lbs. per square inch, and three of 9-in. pipes with ⅞-in. shells an average bursting pressure of 156 lbs. per square inch.

In practice, drains are subjected to bursting pressure only when they are choked, and the amount of this pressure will depend upon the fall from the point of overflow of the sewage to the point of stoppage. Except in the case of long outfall drains without manholes, the head of sewage will seldom exceed 10 ft., and the pressure about 5 lbs. per square inch. Ordinary drain-pipes are therefore quite strong enough to resist the bursting pressures to which they may be subjected in practice, and the same may be said of their resistance to crushing except when laid under walls; in such cases settlement of the walls often fractures the pipes, unless the latter are protected (as required by the new London Drainage By-laws) "by means of an arch, flagstone, or iron support, which shall not bear on the drain and shall be of sufficient size and strength to prevent any disturbance of, or other injury to, such drain."

Pipes may be tested for absorption by placing fragments in water for twenty-four or forty-eight hours, and comparing the weights before and after immersion. A good stoneware pipe should not increase in weight more than 2 per cent. in forty-eight hours.

Some manufacturers now use a special slip for glazing the interior of fireclay pipes, the result being a greenish-yellow glaze of great smoothness, much superior to the ordinary salt-glaze.

Sizes and Proportions.—The new Drainage By-laws of the London County Council specify that drain-pipes of stoneware "or material other than metal" must be proportioned as follows:—

Internal diameter, inches.	Thickness of pipe, not less than	Depth of socket, not less than	Annular space for the cement, not less than
3	½ of an in.	1½ in.	5/16 of an in.
4	⅝ "	1¾ "	6/16 "
5	⅝ "	2 "	5/16 "
6	⅝ "	2 "	6/16 "
9	¾ "	2 "	7/16 "

The thickness of the material prescribed in this by-law varies from one-sixth of the internal diameter for 3-in. pipes to one-twelfth for 9-in. The dimensions stated are the least which will be allowed, and cannot be regarded as excessive, although they are larger than those hitherto allowed by many manufacturers. The following table gives some of the particulars of drain-pipes (2 ft. 6 in. long) manufactured by one of the firms constituting the Leeds Fireclay Co., and will be interesting for purposes of comparison with the new London by-law:—

Diameter in inches.	Thickness in inches.	Depth of socket in Inches.	Weight of pipe 2 ft. 6 in. long in pounds.
4	⅝	1¾	16½
6	¾	2	31½
9	1	2¼	58

The 4-in. pipes have the exact thickness and depth of socket required by the L.C.C., but the 6-in. and 9-in. pipes are in excess of the London requirements.

Drain-pipes, 3, 5, 7, and 8 in. in diameter, are not made by all firms, although it would certainly be a great advantage if such sizes were readily obtainable. A 4-in. drain laid to a gradient of 1 in 40, and running full, is estimated to discharge about 15 cubic feet per minute, a 6-in. pipe under the same conditions about 45 cubic feet, and a 9-in. pipe about 145 cubic feet. It is clear, therefore, that intermediate sizes would often prove useful.

The depth of the socket is an important point, as it is almost impossible to make a watertight joint if the socket is too shallow. Some 4-in. drain-pipes are now made with sockets 3 in. deep, but sockets of great depth ought to be made tapering, or of greater diameter throughout, so that the cement can be thoroughly worked into the annular space between the socket and spigot.

The length of drain pipes is generally measured exclusive of the socket: Thus, a "2-ft." pipe will be nearly 2 ft. 3 in. long. The usual lengths of pipes are as follows:—3-in., 2 ft.; 4-in., 2 ft. and 2 ft. 6 in.; 6-in. and 9-in., 2 ft., 2. ft. 6 in., and 3 ft.; 4-in. pipes 3 ft. long (exclusive of the sockets) are now made by a few firms. The chief advantage of long pipes is the reduction in the number of joints, and the consequent saving of labour and cement; if the pipes are properly laid, there is no greater risk of fracture. As the joints in a stoneware drain are always the weakest places it is obviously an advantage to reduce the number as much as possible.

Clay and Cement Joints.—Ordinary drain-pipes are joined together by fitting the spigot of one pipe into the socket of the pipe previously laid, and filling the annular space between the two with cement mortar, or clay. The latter material is altogether unsuitable for sewage drains. Even if good clay is used, it may be gradually washed away or may crack, and in either case the sewage escapes into the ground; worms will bore through it, and the roots of trees will also penetrate it and often choke the drains. But in many cases, where good clay is not excavated from the trenches, the careless labourer will dignify as clay any kind of mud on which he can lay hands.

The only satisfactory material for joining drain-pipes is Portland cement.* This must be of good quality, finely ground, and thoroughly air-slaked. If cement is used fresh and "hot," it may swell in setting, and burst off the sockets of the pipes. The cement is generally mixed with sand in proportions ranging from one-fourth part to two parts of sand for every one part of cement. The L.C.C. by-laws do not appear to countenance any admixture with sand. A good mortar suitable for all ordinary drainage work is made with equal proportions of cement and of clean, sharp sand. These should be measured and mixed together dry; water should then be sparingly added to produce a stiff paste. The mortar should be made in small quantities and used immediately; cement which has once begun to set can, indeed, be worked up again with the trowel, but the ultimate strength is reduced. A small proportion of sand is useful in giving consistency to the mortar, but any admixture with sand reduces the ultimate strength of the mortar, and excessive quantities render it porous. The tensile strength (at the age of twelve months) of a mortar composed of one part cement and one part sand is only about two-thirds that of neat cement, and if two parts of sand are used the strength is reduced one-half.

Cement joints as ordinarily made are often seriously defective. The sockets are seldom entirely filled with mortar; ridges of mortar are often formed in the interior of the pipes; and the spigot is not always concentric with the socket. The two latter defects are often due to the mortar not being stiff enough. A layer of mortar is spread in the lower half of the socket, and the spigot of the next pipe is then placed in position, resting on the mortar; if this is too thin it is squeezed out as shown at A or B in fig. 2, chapter 6, the result being a ridge of cement in the interior of the drain or faulty alignment, either of which retards the flow of sewage and tends to cause deposits. The defect is accentuated if the pipes are supported on the collars only; holes ought to be cut in the trench to receive the collars, so that the barrels of the pipes are supported throughout their length. In the case of a drain with a fall of half an inch per pipe, ridges of cement (B, fig. 2) half an inch in

* The new L.C.C. drainage by-laws specify that stoneware drains must be "jointed with socket joints properly put together with cement *or other equally suitable material*;" the alternative seems to include the composition used in joints of the Stanford class.

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height divide the drain into a series of pools in which deposits are certain to occur.

Care should be taken to remove any mortar which may be squeezed out of the joint into the interior of the pipe. The simplest method of doing this consists in drawing through the drain a bag or badger. The bag may be filled with straw or other material, but the "Loco" drain-badger shown in fig. 6 is better. It consists of two hardwood discs with rubber flanges, the discs being united by a flexible steel tube, so that the apparatus can be drawn around bends. The badger lies in the pipe last laid, and the handle is passed into the pipe about to be laid; when the joint is complete, the badger is drawn forward over the joint, and the operation is repeated as each pipe is laid. Jones's "drain-follower" is designed for the same purpose, and consists of a bag with two projecting flanges, the bag being inflated with air when in use and attached to a cord.

Tarred gasket is often used to prevent the cement being forced into the interior of the pipe. The gasket is inserted in the annular space between the spigot and socket, and is tightly driven against the shoulder of the socket by means of a proper caulking tool. The remainder of the space is then filled with cement mortar, which ought to project beyond the socket and be bevelled off, as shown in fig. 7. If the gasket is properly inserted, the pipes will be concentric with each other, and the mortar will not exude into the interior of the pipes; but many experts object to the use of gasket on account of its liability to rot and its becoming saturated with sewage.

GENERAL BUILDING NEWS.

ST. COLMAN'S CATHEDRAL, QUEENSTOWN.—This building, situated at an elevation of nearly 150 ft. above the level of the harbour of Queenstown, has been completed. It is over thirty-three years since the foundation of St. Colman's Cathedral was laid to the plans of the architects, Messrs. Pugin & Ashlin, and under the supervision of Mr. Charles Guilfoyle Doran, C.E. When the foundations were complete Messrs. Meade & Son, Dublin, were appointed contractors at the sum of 33,000*l.* The walls were scarcely 12 ft. high, says the *Freeman's Journal*, when the Bishop (the Most. Rev. Dr. Keane), who then held the Crozier of Cloyne, began to look upon the structure as of entirely too plain a character, and a decision was then arrived at that, no matter what the cost, the church should be erected and embellished so that it would be one of the glories of Catholic Ireland. On Mr. Ashlin the task was imposed of taking up the work in its new form, and on him the burden of the architect's work henceforward fell. The whole character of the works was completely changed, and none of the original drawings were adhered to. The contract with Messrs. Meade was thereupon terminated by mutual agreement, and from that stage the Bishop and committee took over the works. The extreme length of the building from east to west is 210 ft., the breadth across the transepts 120 ft., the breadth across the nave and aisles 84 ft., the breadth across the chancel and four side chapels 116 ft.; the height of the ridges of the roofs of the nave, chancel, and transepts 100 ft. There are four octagonal turrets at the angles of the transepts, each about 120 ft. high, and two similar turrets terminating the nave walls on the west front, each containing winding stair approaches to the great organ gallery. The material used in the external facing of the walls is blue Dalkey granite, and the cut stone dressings are of Mallow limestone, except the cornice and gutter courses, which are of Fermoy limestone. The whole of the interior faces of the walls are lined with Bath stone, and the columns of the nave and chancel arcades, and the arcades of the shrines and confessionals, are composed of Irish marbles, all of which have taken a high polish. No building in Ireland is so rich in native marbles as the Queenstown Cathedral. The slates used on the roofs are Belgian green, and all the pipes, ridges, ventilators, and doors of passages through the roofs, are covered with lead. All the gutters are constructed of limestone. The ridges of the roofs of the nave, chancel, and transepts are surmounted by wrought iron crestings, galvanised; and from the extremities of these crestings are carried down the copper ribbon lightning conductors. Colossal statues in white marble of "Our Lady Star of the Sea," stand on the south transept gable, and St. Joseph on the corresponding gable of the north transept. A gilded statue of our Lord is erected on a pedestal at the interior of the intersection roof of the apse, and life-size figures of the twelve apostles, St. Patrick, St. Celestine, and St. Barnabas, are fixed on pedestals that surmount the parapet around the apse and transepts In niches lower down in the building are life-size figures of St. Nicholas, St. Blazuis, St. Francis, St. Brigid, and St. Helen. All the other niches are enriched by figures. Above the large windows that light the transepts in the gables there are inserted two groups of life-size figures—that in the north transept being the Holy Family, and that in the south transept being the Coronation of the Blessed Virgin.

ST. MARY'S ROMAN CATHOLIC CHURCH, DUNDEE.—Various alterations and improvements have recently been carried out at this church, from the designs of Mr. T. M. Cappon, architect, Dundee. For nearly two years the work of improvement has been proceeding. Two towers on the east end, with a connecting screen which forms an outer porch, are the leading features of the external improvements. A peal of bells, made by Mr. Matthew Byrne, Dublin, is being introduced into the north tower. Two gilded crosses crown each of the main roofs of the towers, and the corner turrets are surmounted with crosses of wrought iron. The whole extensions and renovations have been carried out at a cost of between 3,000*l.* and 4,000*l.* The contractors for the various departments of the work were as follows:—Messrs. Robertson & MacPherson, builders; Mr. T. Macaulay, joiner; Mr. T. C. Stocks, joiner; Messrs. J. Farquharson & Son, plumbers; Messrs. William Brand & Son, slaters; Mr. M. Lawless, plasterer; Mr. A. M'Ritchie, plasterer; Messrs. Craven Dunnill & Co., Jackfield, mosaic work; Mr. G. Carnegie, marble work; Mr. William Norwell, decorator; Messrs. James Milne & Son, Edinburgh, gates; Mr. A. M'Call, smith work; Messrs. Lindsay & Scott, glaziers; Messrs. G. H. Nicoll & Co., electrical fittings; Messrs. O'Kane & Gibson, seating. The pulpit has been remodelled and new panels introduced by Mr. James Bremner, carver, Dundee.

BAPTIST SCHOOLS, EAST FINCHLEY.—On the 22nd ult. seven foundation stones were laid in the new Baptist Schools, East Finchley, N. The building is being erected at a cost of about 3,700*l.*, from designs by Messrs. George Baines & R. Palmer Baines, architects, Clement's-inn, Strand, London. The school hall will be of two stories, with classes under side and end galleries, partitioned from each other by swivel panelled partitions, and a spacious platform. At one end of the hall are arranged three classrooms in the rear. The buildings are to be faced with split flints and Bath stone dressings. A church for 760 sittings, with a tower, is part of the scheme, but will not be erected for the present.

METHODIST CHURCH, &C., WOMBWELL BARNSLEY.—A new church, schools, and manse are now in course of erection at Wombwell, near Barnsley, for the Primitive Methodist connexion. The buildings will be in the early Gothic style, with tower and spire about 100 ft. high, and will be built chiefly of Yorkshire stone. Sitting accommodation is provided for 550 people in the church, and under the church will be a schoolroom with six classrooms; the total cost being 5,494*l.* The whole is to be heated on the low-pressure hot-water system and provided with automatic ventilation. Messrs. J. K. Taylor & Sons, of Barnsley, are the contractors, and the work will be carried out under the supervision of the architect, Mr. E. P. Earle, Sheffield.

CONGREGATIONAL SCHOOL, BATLEY.—Plans have been prepared by Messrs. C. H. Marriott, Son, & Shaw, architects, of Dewsbury, of additions and improvements to the present school buildings in Hanover-street, Batley. The contracts have already been let for the constructive works to the following firms:—Masons' work, Mr. Joseph Oldroyd, Batley; joiners', Mr. W. H. Clegg, Dewsbury; slaters', Mr. W. H. Thompson, Batley; plumbers', Mr. James Walshaw, Batley; plasterers', Mr. Samuel Crawshaw, Batley; and Ironwork, Messrs. James Bagshaw & Sons, Batley.

BAND OF HOPE JUBILEE BUILDING.—The foundation-stone of this building, which will be directly opposite the Sessions House, Old Bailey, has just been laid by the Lord Mayor. The architect is Mr. Rowland Plumbe.

IMPROVEMENTS, FULWOOD WORKHOUSE, LANCASHIRE.—At Fulwood Workhouse recently a new boiler-house, electric generating station and heating works were opened. The new building, which comprises a new boiler-house and electric generating station with their necessary adjuncts, such as economiser and pump-house, accumulator rooms, &c., and heating works, occupies a site at the rear of the workhouse, with a reserve of space for future extensions if required. In keeping with the other structures, it is built of brick, with freestone dressings. The generating station consists of boiler-house, engine and dynamo room, accumulator room, pump and economiser house, over which there are offices for the engineering staff. The electrical installation has been carried out by the Alliance Electrical Co., Ltd., Manchester, to the specification and under the direction of Mr. Thomas Whitwell, the engineer to the Guardians. The contractors employed on the works were:—Brickwork, Mr. M. Shorrock, Preston; boiler work, Messrs. Jos. Foster and Son; electric plant, the Alliance Electrical Co., Manchester; steam pipes and heating apparatus, the Brightside Foundry Co., London and Sheffield; economisers, Messrs. E. Green and Sons; pipe coverings, &c., Messrs. Lonsdale, Bros., Ltd., Blackburn.

INFECTIOUS DISEASES HOSPITAL, STONEHAVEN.—A new hospital is being erected for the Kincardine County Council. The architects are Messrs. Brown & Watt, Aberdeen, whose plans were selected in competition. The site is situate at Little Farrochie, on the estate of Urie, to the west of Stonehaven Station. It extends to two acres, and there are altogether five separate blocks of buildings in connexion with the hospital. The central one, and the only one which is two stories in height, is the administrative department. Attached to the administrative block and overlooked from the matron's room there is an observation ward capable of accommodating one patient. The hospital pavilions are three in number, each complete in itself, and will accommodate twenty patients. They are ranged on the east and west sides of the central block. They are of unequal size, and each pavilion has two wards, containing 2,000 cubic feet per patient, for the treatment of male and female in the same class of disease, with separate lavatories and discharge-rooms. The nurses' duty room is placed between the wards, and an inspection window is on each side. To the north is placed the offices block, and it contains a washhouse and laundry, disinfector, ambulance-shed, and mortuary. The sewage is treated before leaving the site by the septic-tank system, the installation having been designed by Messrs. Cameron, Commin, & Martin, of Exeter. The walls are built of stones from the local quarry, and the dressed work is freestone from Brechin. The flooring throughout the wards is Canadian maple, and the interior wall-surface is plastered and finished with Keene's cement. The following are the contractors for the various works:—Mason and carpenter works, Messrs. Allan Gordon & Sons; slater work, Messrs. Charles Maitland & Son; plaster work, Messrs. Sellar & Co.; plumber work, Messrs. Blaikie & Sons; painter and glazier work, Messrs. George Lamb & Son, all of Aberdeen. The total cost will be about 7,000*l.* Mr. Thomas L. Kay has been appointed resident clerk of works.

LLANDUDNO TOWN HALL.—On the 10th ult., as mentioned in our last issue, Llandudno Town Hall and Municipal offices, which have been erected by the Urban District Council at an outlay of about 20,000*l*, were opened. The building is situated in Lloyd-street, and occupies a site which was presented to the town by Lord Mostyn, who laid the memorial stone more than two years ago. The building was designed by Messrs. Silcock & Reay, Bath, their plans being selected out of fifty submitted in competition, and the work has been carried out by Mr. Luther Roberts, contractor. The walls are built of Portland stone, lined with brick. A feature of the design is the large public hall on the ground floor. It is placed at the rear of the building and enclosed by the two wings. It is lighted by ten semicircular side windows and a large window at the end. The walls are panelled, and the whole, covered by an ornamental timber roof, ceiled at the collar. This hall will be let for county-court and police-court work, and adjoining it are retiring-rooms for magistrates and solicitors. It is also so arranged and provided with distinct cloakrooms and lavatories that it will be available for entertainments and such gatherings entirely apart from the municipal portion of the building. The main attraction of the building is the council-chamber, which occupies the whole of the first floor in the centre block. It is lighted by three large windows, and the interior is treated with engaged columns and arcading supporting a coved ceiling. Immediately adjoining this room are the committee-rooms and clerks' offices. One wing of the building is devoted to a suite of offices, which are let, and they are provided with a separate staircase, and are entirely cut off from the municipal offices. The lighting of the entire building is by electricity, and the council chamber, the assembly-hall, the vestibule, and the grand staircase are provided with brass electroliers. These parts of the edifice are also warmed by hot-water radiators, and the whole of the offices are fitted with apparatus for gas fires.

NEW CHURCH, HASLEMERE.—All Saints' Church, Grayswood, Haslemere, was consecrated by the Lord Bishop of Winchester on the 13th ult. A vicarage has also been built. Messrs. Bowman & Sons, of Stamford, were the contractors, Mr. Shelmerdine the clerk of works, and Messrs. Oliver & Dodgshun, of Carlisle and Leeds, were the architects in consultation with Mr. Axel H. Haig.

FARM BUILDINGS, NEWTON RIGG, PENRITH.—Extensive additions have been made to the farm buildings for the County Councils of Cumberland and Westmorland. Messrs. Jno. Richardson & Son, of Penrith, were the contractors; and the work was carried out from the plans and under the superintendence of Mr. Geo. Dale Oliver, of Carlisle, County Architect for Cumberland.

THEATRE ROYAL, YORK.—On the 22nd ult. the members of the York Architectural Society inspected the new Theatre Royal, under the direction of its architect, Mr. Frank A. Tugwell, who explained the features of interest. The wide passage at the side of the old theatre having been incorporated, the new theatre has gained considerably in width.

CLUBHOUSE, BABERTON, EDINBURGH.—A new clubhouse for the Baberton Club is to be erected at Juniper Green. The plans were prepared by Messrs. J. N. Scott and A. Lorne Campbell.

NEW BUILDINGS IN ABERDEEN.—At a meeting of the Plans Committee of the Aberdeen Town Council on the 20th ult. fifteen sets of plans, involving a sum of 12,250*l.*, were submitted. The

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plans included a new warehouse in Jopp's-lane for Messrs Lawson, Ltd.; five dwelling-houses in Hosefield-avenue; a dwelling-house in Braemar-place; and a dwelling-house in Rubislaw Den North.

ROOD SCREEN, AT THE CHURCH, LONGSTOCK, HANTS.—The necessary faculty for the rood screen at this church has been granted. The church was rebuilt and dedicated in 1880, and was erected from the designs of the late Mr. William White, F.S.A. A rood screen was included in Mr. White's original scheme, but monetary reasons prevented its erection. The screen will be executed by Messrs. Harry Hems & Sons, of Exeter.

FOREIGN.

ART NOTES FROM NAPLES.—Mr. Consul Nevill Rolfe's report on the trade, &c., of South Italy for the year 1901 has already reached the British Foreign Office and been laid before Parliament. It is, as usual, a very comprehensive and suggestive document, and the following paragraphs in particular will be read with interest. The discovery of the bronze statue of a torch-bearer near Pompeii, though made some time ago, has not been reported upon before, because the Government held back the statue from public exhibition for several months. It is now exhibited in the National Museum, and represents a youth holding a bracket for a lamp. The bracket is in a glass case near the statue. The statue is what is known as "boy size," and appears to have been coated with silver, which has in the main perished. A good deal of discussion has arisen as to its period, but in all probability it does not date back further than the first century B.C. ——In the disused monastery at Donna Regina, in the heart of Naples, which has now been placed under the control of the municipality, on account of the splendid frescoes found on the walls, a number of interesting pictures and works of art have been found which were apparently stowed away there about the time of the taking of Naples by Garibaldi in 1859. All those of historical interest are to be removed to the Museum of San Martino, where the Bourbon relics, and many interesting specimens of the arts of Neapolitan provinces, chiefly of the sixteenth and seventeenth centuries, are exhibited.——Amongst the new finds in modern pictures are :—A picture of the Masaniello Riots, by Cammarano, and the "Entry of Cardinal Ruffo," by Marinelli; also a very fine portrait of Garibaldi, with a long autograph and inscription, "Con amore filiale." There is also a bronze statue of Ferdinand II., in Roman dress, by Petrarsa, and a plaster cast of Carlo Poerio, who, it will be remembered, was visited by the late Mr. Gladstone when in the political prisons of Naples in 1848. There are also pictures of local scenes and places by Giganti and Mancini of considerable historical value.——The complete modernising of the fine marine palace (Palazzo Donn' Anna), which was begun 300 years ago by Donn' Anna Carafa and never finished, will cause great regret to the lovers of the many romances belonging to the Bay of Naples. The ruin had become the dwelling of several fishermen and other poor people, while three restaurants had established open-air dining-places within its precincts. At one time the tramway horses were stabled there; but in spite of all its many degradations it still stood a magnificent ruin, the delight of artists, with the bright waves washing into its deserted arches, and the spot round which many writers on Naples, and notably Dumas père, had hung many of their most thrilling episodes. It has now become the property of a French gentleman, who is renovating it throughout and will turn it into residential flats.

INDIA.—A section of the Calicut-Cannanore extentension of the Madras railway has just been opened for traffic.——The Secretary of State has sanctioned the construction of an extension of the Bengal and North-Western railway from Ballia to Ghazipur. ——The new market at Calcutta is about to be improved at a cost of 75,000 rupees.——A large hotel is being erected at Mussoorie, and will shortly be opened. —— *Indian Engineering* understands that the Government of India is arranging to secure the services of one of the leading English architects to come out to India under a five years' covenant. That journal adds, "We are not surprised at this, for our present Viceroy aims at getting the best results possible in all that appertains to architecture, and although there are recruits in the country, the few opportunities and small encouragement that they get tend rather to suppress than bring out architectural merit. —— The new premises for the National Bank of India, Calcutta, are nearly completed.——A large theatre, which is to cost a lakh of rupees, is to be erected in Bombay.

LICHFIELD SEWERAGE.—The City Council, at a special meeting on the 19th ult., considered the Report of Mr. J. R. Elliott, of Nottingham, the sanitary engineer engaged to investigate the state of the existing sewerage system. It was resolved to forward the Report to the Local Government Board, and to apply for a loan of 7,000*l.* to carry out the necessary works. Mr. Elliott was appointed Engineer to prepare working drawings, &c.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —Mr. Arnold Kramer M.Inst.C.E., has opened an engineering office for constructions in armoured concrete, at Norfolk House, Norfolk-street, Victoria Embankment; as a London office in connexion with the firm of J. Jaeger & Co., Zurich.

THE PATENT OFFICE LIBRARY.—We have received No. 8 of the Patent Office Library Series, containing the class list and index of the Periodical Publications in the Library. It shows what a valuable repertory of reference literature on mechanics and inventions of various kinds the Patent Office Library includes. The catalogue is published at the Patent Office, price 6*d.*

ELECTRIC LIGHTING OF ST. MICHAEL'S CHURCH, SHEFFIELD.—The electric light was used for the first time in this church on the 16th ult. Plans for the installation were prepared by Mr. C. Hodgson Fowler, F.S.A., and the work has been done by the Electrical Department of the Sheffield Corporation.

BOARD OF EDUCATION, SOUTH KENSINGTON.—In view of the date appointed for the Coronation of their Majesties, the day examinations fixed to be held during the week ending June 28 next will be held during the week ending July 5. A revised copy of the time-table (Form 90*d*) has been prepared.

INCORPORATED CHURCH BUILDING SOCIETY.—This Society held its usual monthly meeting on Thursday, the 20th ult., at the Society's House, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.: building a new church at Tonyrefail, St. David, near Llantrisant, Glamorgan, 130*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Harringay, St. Paul, Middlesex, 60*l.*; Latchford, Christ Church, near Warrington, Lancashire, 25*l.*; Rotherhithe, St. Katharine, Kent, 25*l.*; Thetford, St. Cuthbert, Norfolk, 30*l.*; Bewcastle, St. Cuthbert, near Carlisle, 20*l.* in lieu of a former grant of 15*l.*; and St. Columb Major, St. Columba, Cornwall, 60*l.* in lieu of a former grant of 35*l.* A grant was also made from the special Mission Buildings Fund towards building a mission church at All Stretton, near Church Stretton, Shropshire, 40*l.* The following grants were also paid for works completed :—Sparkbrook, Emmanuel, near Birmingham, 100*l.* (making in all 600*l.*) on account of a grant of 1,000*l.*; South Margate, St. Augustine, Kent, 150*l.*; Bristol, All Hallows, 200*l.*; Walton-on-the-Hill, St. Luke, near Liverpool, 50*l.* on account of a grant of 60*l.*; Ickham, St. John-the-Evangelist, near Dover, 25*l.*; Fletton, St. Margaret, near Peterborough, 20*l.*; Great Tey, St. Barnabas, near Kelvedon, Essex, 50*l.*; South Croxton, St. John-the-Baptist, near Leicester, 10*l.* on account of a grant of 20*l.*; Glass Houghton, St. Paul, near Castleford, Yorks, 40*l.*; and New Catton, St. Luke, near Norwich, 30*l.* In addition to this the sum of 749*l.* was paid towards the repairs of twenty-two churches from trust funds held by the Society. The Annual General Court of this Society will be held at the Church House, Dean's-yard, Westminster Abbey, S.W., on Thursday, May 15, at 3.30 p.m., when the Bishop of London will preside.

LANCASHIRE AND CHESHIRE ANTIQUARIAN SOCIETY. — A meeting of the Lancashire and Cheshire Antiquarian Society was held at Chetham's Library recently, Mr. Edward Sutton presiding. The paper for the evening was one by the Rev. G. A. Pugh, M.A., of Ashton-under-Lyne, on the old stained-glass windows in the Parish Church. Prior to the reading of the paper several exhibits from members were on view. Mr. H. Sutcliffe showed an Egyptian scarab, mounted, of the date about 1500 B.C., from the tomb of Thotmes III. Mr. R. Howarth, of Glossop, had a collection of sixteen Roman lead weights, two spindle wheels, two ornaments, and one bronze weight found at Melandra Castle, near Glossop. Mr. Pugh's paper showed how the ancient glass had been moved about and mixed, but he was able to explain the designs and their history. It dated from the latter half of the fifteenth century, and the windows were mostly memorials to the ancient and powerful family of Ashton. They were peculiarly rich in details of the garb of the period, and many individual members of the family are represented. In some windows can be traced, amid the now perhaps heterogeneous arrangement of the pieces, the story of the life of St. Helena, the daughter of King Coil. These windows are the only monuments to the once powerful Ashton family. As specimens of glass they are, like all others of a similar age, superior in colour to the stained or painted glass of the present day.—In thanking Mr. Pugh for the way in which he had traced out the history of the windows, the Chairman said few members of the Society were probably aware of the rich treasures in glass that Ashton Church possessed. It was a matter of congratulation that so much of the old glass had been preserved, although it might be arranged in a higgledy-piggledy state in some of the windows.—*Manchester Courier.*

BRISTOL CLERKS OF WORKS AND BUILDERS' FOREMEN'S ASSOCIATION.— On the 15th ult. the ninth annual dinner of the Bristol Clerks of Works and Builders' Foremen's Association was held in the Royal Hotel, College-green, Mr. P. Addie presiding over a large attendance. After the loyal and patriotic toasts had been proposed, Mr. R. Slaughter gave "Trade and Commerce of Bristol," Mr. A. Lee responding. Mr. A. S. Scull proposed "Architects, Engineers, and Surveyors." Mr. F. Wills, responding, spoke of the good feeling existing between the masters and their men. Mr. W. S. Skinner also replied. Messrs. W. Kidwell and W. J. Steele submitted "The Bristol Master Builders," and said there was no town in the United Kingdom where there were such amicable relations between master builders and their men as in Bristol. Mr. G. Wilkins (President of the Bristol Association of Master Builders) replied. The Chairman then proposed "The Bristol Association of Clerks of Works and Builders' Foremen," and said that their society was in the right direction. The clerk of works stood in the same position as an umpire at cricket. They held a position which was no sinecure, as they had to know everything connected with the engineering and building trades, and had to be men of rectitude. Their responsibilities were great. Mr. W. F. Read and Mr. E. Turner replied.

REHOUSING SCHEME AT BIRKENHEAD. — At Birkenhead Town Hall, on the 14th ult., Mr. H. P. Boulnois, M.Inst.C.E., held an inquiry on behalf of the Local Government Board into the application of Birkenhead Corporation for the issue of a provisional order under the Housing of the Working Classes Act, 1890, to confirm an improvement scheme for demolishing the alleged unhealthy areas consisting of four courts, containing fifty-five buildings, in Albion-street, Wilbraham-terrace, Albert-terrace, Castle-buildings, and Albion-terrace: thirty houses in Oliver-street and Taylor's-buildings; tuirty-nine buildings in Watson-street, Orderly Home, Orderly Residence, Orderly-avenue, Orderly-place; fifteen houses in Brook-street, Camden-street, and Ross-terrace; and eleven houses in Marshall-street and Marshall-place. The Deputy Town Clerk (Mr. J. Fearnley) laid the Corporation case before the inspector, stating that last September a sub-committee visited the various properties and unanimously agreed with the opinions previously expressed by the Medical Officer of Health (Dr. Marsden). On December 12 last the properties included 125 dwelling houses, occupied by 630 persons of the labouring class; but at the time the scheme was made there were 150 houses on the areas, of which 146 were dwelling houses, three houses and shops, and one a lock-up shop. On February 12 124 houses were occupied by 503 persons. It was the intention of the Corporation to find accommodation for such number of the working classes displaced as the Board might require either on the site of the areas or wherever the Board might approve. The Corporation had not prepared any plans of the type of dwellings to be erected, and if the Board sanctioned the scheme they would endeavour to provide accommodation at similar rentals if possible. The Borough Surveyor (Mr. C. Brownridge, A.M.Inst.C.E.), said the land embraced in the scheme varied in value, but the average price was about 11*s.* 3*d.* per yard. Within a quarter-mile radius of the various blocks of property concerned there were fifty-six unoccupied houses, with rentals from 3*s.* to 9*s.* per week.

FATAL ACCIDENT WHILST PULLING DOWN HOUSES.—Mr. E. Negas Wood, Deputy-Coroner for South-East London, held an inquest at Greenwich on the 21st ult. on the body of Thomas William Dore, a house-breaker's labourer. Deceased was engaged in breaking down houses at Greenwich, when he fell and sustained injuries which proved fatal. The foreman of the job stated that deceased was intoxicated, and he had ordered him off. The jury returned a verdict of "Accidental Death," and added a rider that the London County Council should make a by-law enforcing protection for those working on buildings in course of demolition.

HOUSING OF THE WORKING CLASSES.—In the House of Commons, on the 20th ult., Mr. Hay asked the First Lord of the Treasury whether he could state the cause of the delay in appointing the Select Committees promised by the Government on the second day of the Session to inquire into the desirability of extending the period for the repayment of loans made to local authorities in relation to the housing of the working classes and otherwise, and to inquire into the Standing Orders of the House relating to the clauses in Private Bills affecting the housing of the working classes and other matters. Mr. Balfour: I am informed that proceedings are in progress to constitute both the committees to which my hon. friend refers.—Dr. Macnamara said he hoped the committees would be appointed promptly, having regard to the pledge which had been given.—Mr. Balfour: I hope there will be no long delay.

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY. —A meeting of this Society was held on Friday evening, 12th ult., when Mr. Thomas S. Fraser, architect, read a paper entitled "The Renaissance Architecture of Scotland." Beginning with the various causes which led to the Renaissance movement in Italy at the end of the fifteenth century, the lecturer traced its progress through the different countries of Europe. By numerous lantern views, he showed its gradually increasing influence on the castellated architecture of Scotland and its final ascendency over that style in the eighteenth century. He then referred to the literary and artistic

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eclecticism at the beginning of the nineteenth century, and concluded with more favourable opinions of the tendencies of modern architecture and its advancement along with present day requirements and inventions.

ROYAL SCOTTISH ACADEMY.—At a meeting held on the 12th ult., Mr. George Washington Browne, A.R.S.A., was elected to the full honours of "architect member" of the Royal Scottish Academy. Amongst Mr. Browne's principal architectural works that have been illustrated in our columns we may mention the following:—The Edinburgh Public Library, on the site of old Hope House, Canongate, opened in June, 1890, for which he gained the first premium, upon the award of Mr. Alfred Waterhouse, as assessor, and for the enlargement of which his plans have been since carried out; July 9 and 16, 1887, interior of the reference library, elevation, two views, and plans; and January 1, 1898, "Edinburgh," No. XII. of our series, "The Architecture of our Large Provincial Towns." In the last-cited number of the *Builder* we illustrated his Royal Hospital for Sick Children and premises for Messrs. Redfern in Princes-street; and on December 25, 1886, the United Presbyterian Church, Braid, Edinburgh. In conjunction with Mr. J. M. Dick Peddie, he prepared the plans and designs for the Edinburgh (Princes-street) station hotel of the Caledonian Railway Co. He is the architect of the Royal Bank offices at Glasgow and at Dundee; various offices for the British Linen Bank; the science rooms at George Watson's College, Edinburgh, opened about four months ago; and, with Mr. Peddie, of offices in Edinburgh for the Scottish Equitable Life Assurance Society, the Scottish Provident Institution, and the Standard Life Assurance Co. When pursuing his studies in London Mr. Browne won the Pugin Travelling Studentship, being, it is said, the first Scotsman who won that prize.

OPEN SPACES.—The Metropolitan Public Gardens Association have undertaken the laying-out of Avondale-square, the planting of trees in the churchyard at Norfolk-square, and to promote the acquisition and laying out of churchyards at Poplar, Clapham, and Camberwell. They further propose to lay-out some vacant sites in North Fulham, Denmark Hill, and Islington, provided the Borough Councils respectively concerned could secure their acquisition for public use and enjoyment.—It is stated that a project for new lines advanced by the London United Tramways Co. involves the destruction of the avenue of lime trees and of some of the houses at Barnes-terrace, just above the railway bridge, which form a pleasing feature of the road as it passes along the riverside. —The Surrey County Council have agreed to contribute 10,000*l.*, unconditionally, towards the cost of the purchase of the Marble Hill Estate, opposite Richmond, and to take over the charge and maintenance of an open space, 100 ft. wide, along the Thames bank, between Twickenham Ferry and the Half-mile Tree, wherever the Earl of Dysart's land abuts upon the river. We learn that Mr. Max Waechter, who recently secured and presented Petersham Ait to the Corporation of Richmond, has purchased Petersham Lodge, situated a short distance beyond the meadows, with the object of preserving the view from Richmond Hill. The property had been lately offered to the Town Council at a price of 10,000*l.*—The Duke of Norfolk has entered into negotiations with the Town Council of Arundel whereby he will obtain possession of some corporate property in exchange for a certain payment and about 50 acres in the neighbourhood, and so prevent any interference with the prospect as seen from Arundel Castle.—Mr. Nation is about to present to the National Trust an area of some 30 acres on the top of Rockbeare Hill, Devonshire, for conversion into a park and recreation ground, whence some fine views are to be seen.—A public park at Crieff, in Perthshire, is provided by the munificence of Mr. Macroby, ex-Provost, who has bought from Lord Ancaster, for 1,500*l.*, a plot of 10 acres on the western side of the town, and has given an additional sum of 500*l.* towards the expense of preparing the ground.

ARTIZANS', LABOURERS', AND GENERAL DWELLINGS CO.—From the thirty-fifth annual Report of this company we learn that the work of the year has been the continuance of operations at Leigham Court Estate, and the completion of the roads and footpaths at Noel Park. At Leigham Court 292 houses and 373 maisonnettes are let and occupied; besides these, thirty-three houses and 133 maisonnettes are finished or structurally complete. All these will be ready for occupation during 1902. Nineteen shops are structurally complete, fifteen of which are let. The rental for the year amounted to 20,647*l.* 15s. 11d., being an increase of 1,100*l.* 16s. 5d.; a further substantial increase during the current year is anticipated. It is proposed during 1902 to complete the building of twenty-six maisonnettes on the west side of Hillside-road, and to continue building operations on the lower ground in Kingsmead-road.

A CORRECTION.—In our report of Mr. Osborne Smith's remarks, at the last meeting of the Institute of Architects, in regard to Mr. J. K. Colling's drawings, the name "Mr. H. Batcheor" should have been "Mr. H. Batsford." Mr. Smith was at a considerable distance from the reporter's table, and was not very distinctly heard.

"E.L.B." LIGHTING BOARDS.—We learn that for this week's festival in Paris in celebration of the centenary of Victor Hugo's birth, the Paris Municipality placed the whole of the contract for the illuminations in the hands of the Electric Lighting Boards Co., of London. The illuminations comprised a temporary installation of no fewer than 25,000 8-c.p. lights.

CLEARING A BRADFORD SLUM AREA.—At the Town Hall, Bradford, on the 21st ult., Colonel W. R. Slacke, R.E., Local Government Board Inspector, held an inquiry into the proposed clearance by the City Council of the Longlands District, which has been declared an insanitary area with the approval of the Local Government Board. The area includes Longlands-street, Longcroft-place, Garden-place, Bell-street, Turk-street, One-street, part of Chain-street, part of Grattan-road, part of St. Thomas-road, and part of Roundhill-place, and is mainly inhabited by Irish people. The Town Clerk (Mr. Stevens) appeared for the Corporation, and there were present Dr. Evans, Medical Officer of Health, Mr. J. H. Cox (City Surveyor), and Mr. F. E. P. Edwardes (City Architect). The Town Clerk said the area involved was 22,050 square yards, the number of houses being 294, of which 254 were private dwelling-houses, ten lodging-houses, sixteen houses and shops, sixteen lock-up shops, and two public-houses. In August, 1898, the population was 1 357, or 301 persons per acre, as compared with twenty-one persons per acre for the whole of the city. The death-rate for the three preceding years was 46·6, 42·7, and 41·2 per 1,000. In August last year the Council agreed to clear the area, and later agreed to the erection of 114 new houses in Faxfleet-street, West Bowling, to accommodate a portion of the population displaced. It was also intended to erect upon the area a limited number of small through houses. The population of the area had now diminished to 1,050, and it was proposed to find accommodation for 708 at Faxfleet-street, at a cost of 39,983*l.* The total cost of the scheme, including tenements in the Longlands district, would be 83,194*l.*, and for this borrowing powers would be applied for later.—Evidence was then given on behalf of the opposition, and the inquiry was closed.

WINDOW, SKIPTON CHURCH.—A three-light stained-glass memorial window has just been placed in Skipton parish church. The subject is St. Michael slaying the dragon, illustrating the triumph of good over evil. The archangel is shown trampling on the demon and about to transfix him with upraised spear, while the dragon, with extended claws, endeavours to uproot the tree of knowledge and the tree of life. The work is from the studio of Messrs. Powell Bros., of Leeds.

CAPITAL AND LABOUR.

DUNFERMLINE BUILDING TRADE WAGES.—A meeting of the master builders of Dunfermline was held recently for the purpose of considering a request from the operatives for a year's agreement. After considerable discussion, it was agreed to meet the men on an early date to try to get the wages made uniform with the wages of masons in Edinburgh. It was pointed out that the wages paid in Dunfermline were 9d. per hour for hewers and 9½d. for builders. The masters considered these rates to be higher than the Edinburgh rates.

KIRKCALDY MASONS AND THEIR WAGES.—At a general meeting of the Kirkcaldy United Operative Masons' Society, held in Mitchell-street Hall on the 18th ult., the question of the annual agreement between masters and men was up for consideration, and after some discussion it was agreed to alter Clause 3 of the by-laws to read as follows:—"From June 1, 1902, to May 31, 1903, the standard rate of wages in Kirkcaldy and district shall be 8½d. per hour for hewers and 9d. per hour for builders." The alteration the men ask for is an addition of ½d. per hour for builders, and the secretary was instructed to forward the proposal to the Masters' Association.

THE PENRHYN QUARRY.—Since work was resumed at the Penrhyn Quarry on June 11 last, the number employed has steadily increased until there are now about 800 employed, and the production of slates is now going on at the rate of over 30 000 tons per annum. During the last two months forty-eight workmen have been taken on, twelve being slatemakers, and the remainder rockmen, labourers, &c.

LEGAL.

ANCIENT LIGHT CASE.

THE case of Avery and Wolmerson *v.* Lewis was heard by Mr. Justice Joyce in the Chancery Division on the 19th, 20th, 21st and 24th ult.

This was a light and air case having reference to premises in New Cross-road, S.E. The plaintiffs alleged that the new building which the defendants had erected materially decreased the lights to the rear of their premises, such lights being ancient lights. They claimed a mandatory injunction and damages. The defendants denied that the plaintiffs' light had been materially or substantially interfered with.

Mr. Hughes, K.C., and Mr. Humphreys appeared for the plaintiffs; and Mr. Younger, K.C., and Mr. Jolley for the defendant.

His lordship, having heard the evidence and the addresses of counsel, said he would deliver judgment at an early date.

Judgment was reserved accordingly.

The case will be fully reported in the *Builder* when his lordship delivers judgment.

APPEAL BY A BUILDER.

THE case of Sedgwick *v.* Webley and others came before the Court of Appeal, composed of Lords Justices Romer and Mathew, on the 22nd ult., on the appeal of the plaintiff, a builder, from the decision of Mr. Justice Wright, upon a special case stated by an arbitrator under Section 19 of the Arbitration Act, 1889. The action was brought by the plaintiff against the defendants to recover 60*l.*, balance of an account alleged to be due. The action and all matters in dispute were referred to arbitration, and upon the hearing of the reference the question arose whether a certain document was a certificate of the surveyor that the work had been completed so as to preclude the arbitrator from inquiring whether the work had in fact been completed. The arbitrator held that the document was not such a certificate, but stated a case for the opinion of the High Court upon this point under Section 19 of the Arbitration Act, 1889. Mr. Justice Wright, who heard the special case, decided in favour of the defendants. Hence the present appeal of the plaintiff.

Mr. A. H. Spokes, for the defendants, took the preliminary point that no appeal lay, by virtue of the decision in "In *re* Knight and the Tabernacle Permanent Building Society," with regard to a question of law arising in the course of the reference under Section 19 of the Arbitration Act, 1889.

Their lordships, after hearing Mr. Bonner for the plaintiff (appellant), held that no appeal lay, and dismissed the appeal with costs.

MARYLEBONE ANCIENT LIGHT DISPUTE SETTLED.

THE case of Harrow *v.* the Marylebone District Property Co., Ltd., came before the Court of Appeal, composed of Lords Justices Vaughan Williams, Stirling, and Cozens Hardy, on Wednesday, on the appeal of the plaintiff from an order of Mr. Justice Joyce in the Chancery Division. There was also a cross appeal by the defendants from the same order of the learned Judge.

Mr. Younger, K.C., in support of the appeal of the plaintiff, said the case had been before this court on a previous occasion on a point as to the construction of certain covenants in the lease under which the plaintiff held his premises. When the matter was before their lordships on that occasion, their lordships removed the stay of proceedings granted by Mr. Justice Joyce, and the matter went back to him in order that he might determine whether an injunction should be granted to restrain the defendants from infringing the plaintiff's ancient lights. When the matter came before Mr. Justice Joyce he granted an injunction in the "Yates *v.* Jack" form restraining the defendants from proceeding with their building so as to obstruct the plaintiff's lights; but his lordship refused to grant the mandatory injunction which the plaintiff asked for. The learned counsel stated that under the special circumstances of the case the plaintiff asked for a mandatory injunction. The special circumstances were that the defendants had endeavoured to anticipate the action of the Court by hurrying on with their building. He submitted that the plaintiff was entitled to a mandatory order.

Lord Justice Stirling: Did you ask for a speedy trial?

Mr. Younger: We were willing, but I do not think the defendants were.

Mr. Dankwertz, K.C.: I will go to trial to-morrow if your lordships like. I will do more. I will submit to an independent report to the Court, and will abide by that report.

Lord Justice Vaughan Williams (to Mr. Younger): What do you say to that?

Mr. Younger replied he did not think the plaintiff could agree to that.

Lord Justice Vaughan Williams: Are you willing to concur with Mr. Danckwertz in trying to expedite the trial?

Mr. Younger: There is no objection to having a speedy trial.

Lord Justice Vaughan Williams said that the learned counsel had better go to Mr. Justice Joyce and get him to hear the case at once.

Mr. Younger replied that he did not think the state of his lordship's list was such that he would be likely to accede to the application.

After some further discussion the learned counsel consulted together, and in the result it was stated that the Court would not be troubled with the case as the parties had arrived at a settlement of the matters in dispute. The terms of the settlement were not stated.

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RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

18,816.—TESTING OF ELECTRICITY: *C. L. Clarke.* Two synchronous motors of which the armatures are oppositely rotated by the two currents and which carry radially-slotted discs, compose a phase and frequency difference indicator for two alternating currents, the two discs being so arranged that one can be seen through the slots in the other. When the coincidences are stationary the difference in phase of the currents will be indicated by the angular distance of one at either side of a fixed zero, and observers will also be able to detect which current leads the other, but if the two currents are but slightly different as in respect of their frequency the slots will rotate in the direction of the rotation of the motor which carries the current of higher frequency, whilst the number of visible coincidences of the slots will be reduced to a minimum. A graduated scale carries the zero mark, which can be adjusted by feeding both motors with one current. Various forms of the apparatus are specified by the inventor.

18,817.—PARALLEL RULERS: *G. A. Kay.*—Cross-links are pivoted to the two members of the ruler at one end, and at the other end to blocks which slide upon guide-rods. The members are thus joined together, and can be secured to any adjustment desired by means of a screw-clamp.

18,822.—A UNION FOR PIPES: *M. Snyder.*—For effecting a water-tight joint for a trap, valve, and so on, the inventor fashions an annular sunken part and an annular and engaging projection, upon the two parts, respectively, of the union, which are tightened together with screw bolts; the projection is formed with annular grooves.

18,841.—A POLISH FOR GLASS, &c.; *A. E. Joyner.*—For polishing glass and similar purposes a powder is compounded of fine gilder's whiting, pulverised pumice-stone, and exhibition red.

18,849.—FACING BLOCKS, SLABS, TILES, &c.: *R. A. Matthews.*—The blocks, tiles, and similar articles are intended for use in constructing hearths, walls, floors, fireplaces, and so on. They are fashioned with bevelled or rounded recesses that will take plaster, and cross-pieces are luted or cemented in recesses in the backs of the green goods to be fixed in the course of burning.

18,892.—A CONTRIVANCE FOR GAS STOVES: *J. W. B. Wright and H. Darwin.*—The lower edge of an adjustable metallic plate is disposed so that the plate shall rest upon the top of the burner-fitting from which it inclines backwards. The parts of the plate are adjustably joined together with slots and screws to render it available for any open grate, and it is either perforated, or otherwise so formed that it will constitute a holding for a layer of cement upon which the blocks of asbestos are placed.

18,914.—A QUANTITY METER (ELECTRICITY): *T. A. Edison.*—A beam balanced upon knife-edges carries from its middle a counter to which a wheel is geared, when a short coil that carries the current which is to be measured raises an iron core so as to shift the beam from its zero position, the wheel will be put into frictional engagement with a cam that constantly rotates, and the wheel becomes freed during a portion of each rotation of the cam, whereupon the beam becomes free to turn, one end of the shaft of the wheel lies upon a screw and will be lifted slightly by the cam. An electrical motor having a vertical spindle with arms that carry two weighted centrifugal levers rotates the cam, and the motor-speed is kept constant by means of fibre brake blocks which are brought into contact with a fixed and smooth plate of glass. A tube of pure Norway iron, moving between elastic stops, constitutes the core of the current measurer, the action of an increase of current upon the core is retarded by means of a coil mounted upon a clamp adjustably on a copper tube hanging from one end of the beam, which is intended to prevent the mechanism of the meter from being disarranged when a short circuit arises upon the consumer's side before the cut-outs come into play. A fine wire winding, connected in series with the motor between two mains promotes the action of the coil, and affords accurate registration in case of small current. The coil for a three-wire system can be wound in four layers, of which the outer and inner layers are connected in series in one outer wire, with the two layers between in series in the other outer wire. If the current becomes excessive, the corresponding layers of the coil will be short-circuited by the motion of an armature derived from electro-magnets in the outer wires.

18,924.—SWITCHES FOR INCANDESCENT LAMPS AND SIMILAR PURPOSES: *W. H. Chipperfield and E. S. Cook.*—In one form of a lamp-holder switch the inventors cause a contact-carrying block to slide within a slot in the holder. In another shape they provide a groove or slot wherein the contact-block or springs will slide so as to complete circuit between the fixed contacts. Struts or bars fit into recesses in the walls of the slots, and their outer ends are forced against the spring contacts or springs upon the contacts; by this means the pushing of the struts beyond the dead centre will afford a rapid make and break.

18,933.—FITTINGS FOR GAS BRACKETS AND GASALIERS: *E. C. Harvey.*—A cap or sleeve, with openings in its side and a similarly pierced cylindrical head, is placed, around the burner, upon the gallery of a bracket, or the cylindrical head may be open and have a wire gauze cover. The bunsen burner thus constituted will serve to heat asbestos, &c., within a casing carried by a skeleton arch or dome; a water-tray hung upon the bracket will keep the air moist.

18,937.—SLIDING EXTENSION LADDERS: *J. Brown and H. N. Brown.*—A rope around a pulley upon the lower section will lift up the upper section which can be sustained at any height desired with angular arms secured to a cross-shaft upon it and resting upon a rung of the lower section. The rope is passed over a pulley at the foot of the lower section, thence through an eye of the upper section, and so to its fastening upon one of the arms; the movement of the arms, which are weighted, is restricted with a stopping-pin upon the upper section. For large ladders an eye-bar, that serves as a handle, is employed for the threading of the lifting-rope.

18,945.—AN APPLIANCE FOR USE WITH KEY-HOLES: *A. M. Young.*—The inventor seeks to provide against the unauthorised opening of a lock or padlock; he adapts an auxiliary lock having strips that will slide in the grooves of pieces which are made in one piece with, or secured to, the principal lock, the travel of the minor lock is held or limited by a screw in one of its pieces which engages with a slot in the minor lock of which the bolt will engage with a staple when the auxiliary lock is set in place so as to guard the keyhole of the main lock.

18,950.—PILES FOR CONSTRUCTIVE PURPOSES: *O. Hoff and C. F. Haglin.*—Tubular and centrical cores are fashioned in concrete piles, and V-shapened rods or braces are threaded spiralwise from the top to the bottom of the cores. The bent centre of each brace clips the core, and the outer ends engage by their bends and hooks with the concrete, or may be fitted around subsidiary cores or pipes joined together with hooked rods or links. Shoes, either blunted or pointed, are fitted on to the piles, which are to be sunk by the forcing of water-jets through pipes. Each of the shoes is attached to hooked anchor-bars or rods embedded in the concrete. For sheet piles for coffer dams and similar purposes the piles have sheathed wedge-points, tubular cores, and radial V-shapened strengthening rods, and their edges are rounded and grooved. As the piles are being sunk lubricating-water is forced through grooves cut down their edges nearly as far as their points, and cement may be filled in through the tubular cores and cross tubes into those grooves and between the piles.

18,997.—A DOUBLY-ACTING SPRING HINGE: *W. K. Sandstrom.*—A spring that will close a door when opened in either direction has its two ends joined to two collars, and is enclosed in a case. The balls of the bearing of a spindle are carried by a middle pivot; the squared end of the spindle fits into a hole in a piece attached to the door, and its cup-shapened lower end takes a pivot. As the door is being opened, one of two rings is locked with a stop upon the casing, whilst the other ring is taken round with the door-spindle. A metallic lid excludes dust, and for tightening the spring a key is to be inserted through an opening in the covering plate.

19,045.—AN APPLIANCE FOR USE WITH GRABS: *W. D. Priestman and W. H. Dean.*—It is contrived that the winding in or paying out of the grab-chain shall automatically open or close a single-chain grab. From the crane jib end are hung rods or chains which support levers pivoted on to a ring, and hooked for engagement with the crown of the grab. As the grab is lowered, a weight (through which the chain is passed) lies upon the upper ends of the levers, and so keeps them asunder, but the weight will be lifted by a catch, and thereby the levers will become engaged with the crown of the grab as soon as the grab has been closed, owing to the upward motion of the chain to liberate the catch.

19,061.—IMPROVEMENTS IN INCANDESCENT GAS BURNERS: *W. T. Sugg.*—In order to obviate "lighting-back," a pierced metallic disc is placed over an enlargement of the tapering tube just beneath the extension which holds the steatite burner up. The tip is drilled through with outlet holes near its edges, the middle portion being solid.

19,097.—APPARATUS FOR WINDOWS, VENTILATORS, &C.: *E. Wait.*—A shutting and opening mechanism consists of a sliding rack and a pinion, which work cranks, upon a shaft that are linked to a ventilator, fanlight, shutter, and so on; a screw, worked with a cord and a pulley, turns through a threaded nut or lug of the rack; the cranks are moved into contact with stops or extensions of the guide-frames when the window is quite opened. By another method a worm-screw set in gear with a worm-wheel that slides on the screw-spindle serves to turn the screw, or the worm-wheel which is screwed internally will work upon the screw when the latter is secured to the rack.

19,120.—A VENTILATING CHIMNEY-TOP: *H. E. C. Jahn.*—The inventor provides passages or recesses in the blocks of a chimney-top which either in couples or separately constitute wind-inlets directed upwards, and are also tapered in various forms, as specified by him.

19,130.—APPARATUS FOR BRICK-MOULDING MACHINES: *S. Weldon.*—To prevent the clay from adhering to the die the hollow plungers are supplied with steam through a set of pipes whereof the lowest pipe slides through a stuffing-box and a bush within a screwed sleeve and a cylinder above; of the set of pipes the inlet pipe is clipped on to the frame of the moulding machine and has an elbow which turns freely upon the screwed end of the inlet pipe; a lubricant can be passed through oil-holes drilled through the stuffing-box.

19,154.—BLOW-PIPES AND SIMILAR BURNERS: *J. W. Hancock.*—An inner tube is fitted within the blow-pipe or burner in such a manner that a jet of gas which issues from the tube will set up a current of air through the outer tube, whereupon the mixed gas and air will burn at the outlet beyond.

19,183.—ATTACHMENTS OF ELECTRICAL SWITCHES: *E. G. Harcourt.*—The cover or dome is retained in its place by means of springs which are set inside a flange of the base, and there are slots in the flange through which the ends of the springs are passed for engagement with the flange of the dome. A slot upon the dome provides for its easy removal. Other modifications are specified. The dome, for instance, has a flange fashioned with grooves or pins, and it can be secured with a bayonet joint, or the flange is fitted with a lip, only one spring being used.

MEETINGS.

FRIDAY, FEBRUARY 28.

Architectural Association Discussion Section.—Mr Vivian H. King on "Design in Furniture." 7.30 p.m.

Institution of Civil Engineers.—(Students' meeting)—Mr. A. M. Arter on "Indicating High-speed Steam-engines." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. A. Wellesley Harris on "Methods of Disinfection." 7 p.m.

Devon and Exeter Architectural Society.—Meeting at Exeter. Mr. A. S. Parker on "Building By-laws."

SATURDAY, MARCH 1.

Royal Institution.—Rt. Hon. Lord Rayleigh on "Some Electrical Developments"—III. 3 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Marylebone Stoneyard, Richmond-street, Edgware-road, W. 3 p.m.

British Institute of Certified Carpenters.—Special meeting (Carpenters' Hall). 6 p.m.

MONDAY, MARCH 3.

Royal Institute of British Architects.—1. Special general meeting to elect the royal gold medallist for the current year. The Chairman to move:—"That, subject to his Majesty's gracious sanction, the royal gold medal for the promotion of architecture be presented this year to Mr. John Francis Bentley for his work as an architect. 2. The eighth general meeting will then be held, when Sir W. B. Richmond, K.C.B., R.A., will move the following resolution:—"That in view of a resolution of the Coal Smoke Abatement Society, seeking the co-operation of the Institute, members are invited to join the Society, or that such other assistance be given by the Institute as the Council may deem desirable." 8 p.m. [An exhibition of about a hundred photographs of architectural work, forming part of the collection of the National Photographic Record Society, will take place at the meeting above announced, prior to the collection being deposited in the British Museum. It is hoped that Sir Benjamin Stone, chairman of the Society, will attend the meeting and say a few words with reference to the exhibition.]

Society of Arts (Cantor Lectures).—Mr. J. D. Geddes on "Photography Applied to Illustration and Printing."—1. 8 p.m.

Society of Engineers.—Mr. B. H. Thwaite on "British *versus* American Patent Law Practice and Engineering Invention." 7.30 p.m.

Sanitary Institute.—Demonstration of book-keeping as carried out in a sanitary inspector's office, by Mr. A. Taylor (at Parke's Museum). 7 p.m.

Liverpool Architectural Society (Incorporated).—Mr. B. M. Ward on "Weather-tight Windows." 6 p.m.

Glasgow Philosophical Society.—Mr. J. Somerville on "The Habitat and Mode of Growth of the Dry Rot Fungus," illustrated by the microscope. 8 p.m.

TUESDAY, MARCH 4.

Society of Arts (Applied Art Section).—Mr. Gerald C. Horsley on "Structural Colour Decoration of the Interior of Public Buildings." 8 p.m.

Institution of Civil Engineers.—Paper to be further discussed: "Electrical Traction on Railways," by Messrs. W. M. Mordey and Bernard M. Jenkin. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. H. R. Kenwood on "Water: Composition, Pollution, and Purification." 7 p.m.

WEDNESDAY, MARCH 5.

Society of Arts—Mr. E. Price Edwards on "Sound Signals." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at L.C.C. Common Lodging House, Parker-street, Drury-lane. 3 p.m.

British Archæological Association.—Mr. Cecil T. Davis on "A Chapter in Local History—Wandsworth, 1545-1558."—8 p.m.

Royal Archæological Institute.—(1) Professor T. McKenny Hughes, M.A., F.R.S., F.S.A., on "Early Potters' Art in Britain;" (2) Mr. F. G. Hilton Price on "Pawnbrokers' Signs in London in the Seventeenth and Eighteenth Centuries." 4 p.m.

Institution of Civil Engineers.—Students' visit to the works of the Vauxhall Bridge, in course of construction. Assemble at the Works, Westminster side, 2.30 p.m.

Edinburgh Architectural Association.—Mr. G. Witter on "A Visit to Oxford," illustrated by limelight views. 8 p.m.

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THURSDAY, MARCH 6.

Carpenters' Company, Carpenters' Hall, London Wall (Free Lectures on Matters connected with Building).—Professor W. Ramsay, F.R.S., on "The Bearing of Modern Chemical Theory on some Problems connected with the Building Trade." 8 p.m.

Institution of Electrical Engineers (Dublin Section).—Adjourned discussion on Mr. W. Tatlow's paper on 'Irish Water-Power and its Electrical Development."

FRIDAY, MARCH 7.

Architectural Association.—Mr. J. Miller on "The Glasgow Exhibition." 7.30 p.m.

Birmingham Architectural Association. — Mr. F. E. P. Edwards on "Elme's Work in Liverpool."

Sanitary Institute (Lectures for Sanitary Officers).—Dr. H. R. Kenwood on "Elementary Statistics." 7 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. W. Beaton on "Glasgow International Exhibition, 1901." 8 p.m.

SATURDAY, MARCH 8.

Royal Institution. — Rt. Hon. Lord Rayleigh on "Some Electrical Developments" (IV.). 3 p.m.

British Institute of Certified Carpenters.—Visit to Messrs. F. W. Reynolds, engineers, Blackfriars-road. 3 p.m.

Edinburgh Architectural Association. — Visit to Edinburgh and Leith Corporations new gasworks at Granton.

Dundee Institute of Architecture.—Mr. D. L. Allan on "Brittany." 7 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 14.—By HENRY HOLMES & Co. (at Chelmsford).

Ingatestone, Essex.—Mill Green Common, Potters Row Farm, 11 a. 3 r. 25 p., c. £325

February 15.—By ERNEST J. GALE (at Burnham).

Burnham-on-Crouch.—High-st., Cupola House, c., p. 1,250
High-st., two copyhold building sites..... 740
High-st., a riverside wharf and landing stage, c. 440
Chapel-st., three copyhold building plots 650

February 17.—By GEORGE STOCKINGS.

Hackney.—Spurstowe-rd., i.g.r. 36*l.*, u.t. 58 yrs., g.r. 6d. 710
King Edward-rd., i.g.r. 22*l.* 10s., u.t. 41 yrs., g.r. 2*l.* 350
Penshurst-rd., i.g.r. 38*l.*, u.t. 52 yrs., g.r. 1*l.* .. 680
Islington.—St. Paul-st., &c., i.g.r. 31*l.* 10s., u.t. 25½ yrs., g.r. 12*l.* 12s. 250
St. Philip-st., &c., i.g.r. 73*l.* 13s., u.t. 25½ yrs., g.r. 39*l.* 430
Clerkenwell.—Granville-sq., i.g.r. 16*l.*, u.t. 24½ yrs., g.r. 4*l.* 165
Barnsbury.—Hemingford-rd., i.g.r. 36*l.*, u.t. 39 and 40 yrs., g.r. 15*l.* 325
Holloway.—Harvist-rd., i.g.r. 19*l.* 10s., u.t. 41 yrs., g.r. 1*l.* 10s. 295
Lowman-rd., &c., i.g.r. 24*l.* 10s., u.t. 62½ yrs., g.r. 11*l.* 14s. 270
Islington.—57 to 63 (odd), Queen's Head-st., u.t. 24 yrs., g.r. 13*l.*, y.r. 126*l.* 725

By GRAVES & SON.

Bayswater.—18, Sutherland-pl., u.t. 44 yrs, g.r. 8*l.* 8s., e.r. 60*l.* 400

By WILKINSON, SON, & WELCH (at Brighton).

Preston Park, Sussex.—4, Florence-rd., f., p. 950

February 18.—By BEARD & SON.

Bayswater.—29, 31, and 33, Ledbury-rd., u t. 41½ yrs., g.r. 24*l.*, y.r. 158*l.* 10s. 1,425

By DEBENHAM, TEWSON, & Co.

Notting Hill.—Talbot-grove, the Ladbroke Hotel, u.t. 59 yrs., g.r. nil, r. 100*l.* 1,820
Islington.—High-st., f.g.r. 65*l.*, reversion in 34 yrs. 3,670

By Messrs. FOSTER.

Cavendish-square.—Wigmore-st., f.g.r. 80*l.*, reversion in 57 yrs. 3,040
Hyde Park.—8, Little Sussex-pl, u.t. 31 yrs., g.r. 16*l.*, y.r. 130*l.* 1 510

February 18.—By MONTAGU HOLMES & SON.

Maida Vale.—16 and 18, Clifton-rd., u.t. 68¾ yrs., g.r. 42*l.*, y.r. 230*l.* 3,600
9, Lanark-mews (stabling), u.t. 46½ yrs., g.r. 4*l.*, y.r. 30*l.* 335

By ORGILL, MARKS, & LAWRENCE (at Masons' Hall Tavern).

Shaftesbury-avenue.—Macclesfield-st., the Macclesfield p.-h., u.t. 48½ yrs., r. 200*l.*, with goodwill 5,300

By HOLLIS & WEBB (at Leeds).

Morley, Yorks.—Scotchman-lane, Morley Spring Wood, &c., 45 a. 3 r. 36 p., f. 1,205

February 19.—FISHER, STANHOPE, & DRAKE.

Hackney.—92 and 94, Lauriston-rd., u.t. 41 yrs., g.r. 13*l.*, q.r. 85*l.* 860
Stoke Newington.—9 and 11, Woodland-rd., u.t. 62½ yrs., g.r. 10*l.*, q.r. 58*l.* 665
114, Cazenove-rd., u.t. 74 yrs., g.r. 14*l.*, y.r. 70*l.* 940
Tottenham.—1, 2, 3, and 4, Waggon-lane, f., w.r., 52*l.* 420

By G. PEARCE & SONS.

Westbourne Park.—55, Tavistock-st., u.t. 62 yrs., g.r. 9*l.*, e.r. 55*l.* 425
Hoxton.—14 and 16, Holt.-pl., and 19 and 21, Norris-st., u.t. 17 yrs., g.r. 6*l.*, w.r. 135*l.* 4s. 350

By ALFRED RICHARDS.

Enfield.—Sydney-road, Enfield House, area 12,465 ft., f., with goodwill of a draper's business 4,000
1, Gentleman's-row, also Eastbury and Claredon Cottage, total area 790 yds., f., y.r. 82*l.*.. 380
Edmonton.—1 to 6, Parson's Cottages.f., w.r. 93*l.* 12s. 1,000
Dalston.—9 and 11, Marlborough-rd., u.t. 43 yrs., g.r. 16*l.*, y.r. 52*l.* 350
Tottenham.—64, Northumberland-pk., u.t. 71½ yrs., g.r. 7*l.* 10s., y.r. 36*l.* 330

By J. S. RICHARDSON.

Hampstead.—13 and 14, Lawn-rd., u.t. 49 yrs., g.r. 53*l.* 6s. 1,400

By T. B. WESTACOTT.

Camden Town.—78, Arlington-rd., f., w.r. 126*l.* 16s. £910
Dulwich.—155, Underhill-rd., u.t. 80 yrs., g.r. 7*l.* 10s., e.r. 40*l.* 330

By W. N. WILLOUGHBY.

Norwood.—26, Court-rd., u.t. 77 yrs., g.r. 13*l.* 10s. y.r. 85*l.* 975
Dulwich.—80, Dalmore-rd., u.t. 80 yrs., g.r. 6*l.*, y.r. 40*l.* 480

DOUGLAS YOUNG & Co.

Brixton.—10, Stockwell Pk. Walk, u.t. 79½ yrs., g.r. 8*l.* 5s., y.r. 45*l.* 460
164, Loughborough Pk., u.t. 20 yrs., g.r. 7*l.*, e.r. 55*l.* 415
Clapham.—South-rd., Sunnyside, u.t. 22½ yrs., g.r. 25*l.*, e.r. 90*l.* 320

By FOSTER & CRANFIELD.

Kingsbury.—Kenton-lane, the Cottage and 20 a. 3 r. 8 p., f., ... 7,525
Kentish Town.—Kentish Town-rd., f.g.r.'s 22*l.* 10s., reversion in 8 yrs. 11,040
Prince of Wales-rd., f.g.r. 1*l.*, reversion in 8 yrs. 5,400
Haverstock Hill.—No. 46, f.g.r. 16*l.*, reversion in 21 yrs. 650
Camden Town.—Park-st., f.g.r.'s 20*l.*, reversion in 15 yrs. 4,110
Kentish Town.—Malden-rd., the Newbury Arms, p.-h., f.g.r. 12*l.*, reversion in 38 yrs. 1,110
Malden-rd., the Sir Robert Peel, p.-h., f.g.r. 7*l.* 10s., reversion in 38 yrs. 2,140
Marsden-st., The Prince Albert p.-h., f.g.r. 10*l.*, reversion in 38 yrs. 1,010

By RUSHWORTH & STEVENS.

Hampstead.—1, 2, 4, 5, 6, 8, 9, 10, 11, and 12, Belsize-sq., u.t. 50 yrs., g.r. 180*l.*, y.r. 980*l.*.. 7,565
3, Lancaster-pl., u.t. 50 yrs., g.r. 18*l.*, p. 370
5 and 7, Lancaster-pl., u.t. 50 yrs., g.r. 36*l.*, y.r. 145*l.* 1,020
63, 65, 69, 71, 73, 75, and 77, Belsize Pk.-gdns., u.t. 61 yrs., g.r. 210*l.*, p. 3,330
50, 54, 58, 62, 64, and 70, Belsize Pk.-gdns., u.t. 61 yrs., g.r. 180*l.*, p. 2,780
60, Belsize Pk.-gardens, u.t. 61 yrs., g.r. 30*l.*, y.r. 113*l.* 14s. 750
6 and 10, Belsize-grove, u.t. 61 yrs., g.r. 60*l.*, p. 900

By SWAN WOODCOCK (at Stratford).

Upton Park.—26, 28, and 30, Upton Pk., u.t. 76½ yrs., g.r. 12*l.*, w.r. 80*l.* 12s. 545

By J. H. BULMER.

Bermondsey.—174, Abbeyfield-rd., u.t. 53 yrs., g.r. 5*l.* 10s., y.r. 34*l.* 450
Rotherhithe.—10, Clarence-st., f., w.r. 18*l.* 4s.... 260
45 to 55 (odd), Albion-st., f., w.r. 126*l.* 2s..... 1,205

By HATCH & HATCH.

Catford.—3, Laleham-rd., u.t. 93 yrs., g.r. 4*l.* 15s., w.r. 31*l.* 4s. 285

By McINTOSH & Co.

Bermondsey.—159 and 161, Drummond-rd., u.t. 93 yrs., g.r. 12*l.*, w.r. 78*l.* 605
Dulwich.—14, Adys-rd., u.t. 74 yrs., g.r. 5*l.* 5s., e.r. 32*l.* 315
Bermondsey.—2A and 2B, Layard-rd., u.t. 93 yrs., g.r. 12*l.*, w.r. 78*l.* 620
Brixton.—15, Railton-rd. (S), u.t. 66½ yrs., g.r. 8*l.*, y.r. 60*l.* 395
Peckham.—42, Sunwell-st., f., w.r. 33*l.* 16s..... 450
Battersea.—1, Lubeck-st. (S), u.t. 44 yrs., g.r. 5*l.*, w.r. 36*l.* 8s. 250
Kennington.—40, Lower Kennington-ln. (S), u.t. 33½ yrs., g.r. 10*l.*, r. 60*l.* 760

By NEWBON, EDWARDS, & SHEPPARD.

Soho.—3, West-st., and 30, Litchfield-st., f., y.r. 60*l.* 1,970
Holloway.—Magdala-rd., &c., f.g.r.'s 30*l.*, reversion in 66 yrs. 760
Hornchurch, Essex.—Claremont-rd., f.g.r. 30*l.*, reversion in 78 yrs. 700
Holloway.—4, Hilldrop-cres., u.t. 46 yrs., g.r. 8*l.*, e.r. 55*l.* 555
Cricklewood.—27, The Village, u.t. 50 yrs., g.r. 8*l.*, w.r. 32*l.* 10s. 255
Pentonville.—29, Wharton-st., u.t. 24½ yrs., g.r. 8*l.*, y.r. 42*l.* 380
Islington.—19, Cloudesley-st., u.t. 15 yrs., g.r. 8*l.*, y.r. 42*l.* 235
Canonbury.—64, Halton-rd., u.t. 16½ yrs., g.r. 7*l.* 10s., y.r. 40*l.* 230
Hackney.—250, Victoria Pk.-rd., u.t. 52 yrs., g.r. 11*l.*, e.r. 55*l.* 600
Barnsbury.—13, Westbourne-rd. (S.), u.t. 57 yrs., g.r. 10*l.*, y.r. 56*l.* 620
South Lambeth.—36 to 50, Pk. Mansions (Flats, Block C), u.t. 93 yrs., g.r. 115*l.*, e.r. 661*l.* 5s. (including mortgage) 3,745
Holloway.—49, Campbell-rd. (S.), f., y.r. 50*l.*.... 800

By T. D. PEACEY.

Euston-rd.—Nos. 400 and 400A, also 6, Diana-pl. (shops and factory), f., y.r 165*l.* .....
Lewisham.—2 to 14 (even), Vian-st., f., w.r. 88*l.* 8s.

By HARRIE STACEY.

Reigate, Surrey.—Alma-rd.. enclosure of building land, 1 a. 1 r. 16 p., f. 650
Reigate Hill, "Brokes Meadow" (res.) u.t. 60 yrs., g.r. 20*l.*, y.r 129*l.* 7s. 6d. 1,269
Reigate Hill, "Brokes Lodge" and 4 a. 1 r., part f. and part u.t. 67 yrs., g.r. 75*l.*, e.r. 300*l.* 3,000
Redhill, Surrey.—140, Station-rd., u.t. 43 yrs., g.r. 10*l.*, y.r. 71*l.* 12s. 720
Reigate, Surrey.—Hardwicke-rd., Keroula, u.t. 65¾ yrs., g.r. 5*l.*, q.r. 40*l.* 400
74, Holmesdale-rd., u.t. 60½ yrs., g.r. 8*l.* 12s. 6d., y.r. 35*l.* 350
Alma-rd., Reay Cottage, u.t. 66 yrs., g.r. 10*l.* 2s. 6d., y.r. 45*l.* 400
A freehold spring of water in Raglan-rd., Reigate, with right of maintaining water pipes, y.r., 40*l.* 660

February 20.—By CHARLES VARLEY.

Stoke Newington.—11 and 13, Prince George-rd., u.t. 91 yrs., g.r. 13*l.*, y.r. 72*l.* 720
Battersea.—53, Belleville-rd., f., y.r. 32*l.* 525
144, Lavender Hill, u.t. 71½ yrs,, g.r. 10*l.* 10s., y.r. 60*l.* 440

February 21.—By A. J. SHEFFIELD.

Woodford.—Cres.-rd., Thorganby Lodge and Elizabeth Lodge, f., y.r. 66*l.* 1,120
Cres.-rd., a piece of building land, f., y.r. 2*l.* .. 100
Poplar.—30 and 32, Brigh-st., f., w.r. 59*l.* 16s. .. £735
22 to 36 (even), Grundy-st., u.t. 26½ yrs., g.r. 20*l.* 10s., w.r. 192*l.* 8s. 1,120
24 and 26, Guildford-rd, u.t. 173 yrs., g.r. 14*l.*, y.r. 87*l.* 900
East Ham.—112 and 114, Boleyn-rd., f., w.r. 65*l.* 550

By WAGSTAFF & SONS.

Highbury.—111, Riversdale-rd., f., y.r. 32*l.*..... 560
38, Harsell-rd., u.t. 83 yrs., g.r. 8*l.*, y.r. 44*l.* .. 420

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 11 6	per 1,000	alongside, in river.
Rough Stocks and Grizzles.....	1 9 6	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 5 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts ..	1 12 0	,,	,, ,,
Best Fareham Red	3 12 0	,,	,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,,	,,
Do., Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 5 6	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers..	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers..	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.

	s. d.		
Thames and Pit Sand	7 3	per yard,	delivered.
Thames Ballast	6 0	,,	,,
Best Portland Cement	32 0	per ton,	delivered.
Best Ground Blue Lias Lime..	25 0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. od. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
Ancaster in blocks	1 11	per ft. cube,	deld. rly. depôt.
Bath ,, ...	1 7	,,	,,
Farleigh Down Bath ..	1 8	,,	,,
Beer in blocks	1 6	,,	,,
Grinshill ,, ...	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks..	2 4	,,	,,
Red Corsehill ,,	2 5	,,	,,
Closeburn Red Freestone	2 3	,,	,,
Red Mansfield ,,	2 4	,,	,,
Hard York in blocks ..	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super.	at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3 0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 2 in. self-faced Ditto	0 9½	,,	,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.	deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super.	deld. rly. depôt.
,, ,, ,, 3 in. do.	1 2½	,,	,,

SLATES.

in. in.	£ s. d.		
20×10 best blue Bangor..	12 0 0	per 1000 of 1200	at rly. dep.
,, best seconds ,,	11 10 0	,,	,,
16×8 best ,,	6 15 0	,,	,,
20×10 best blue Portmadoc ..	11 5 0	,,	,,
16×8 best blue Portmadoc	6 0 0	,,	,,
20×10 best Eureka unfading green....	12 2 6	,,	,,
16×8 ,, ,,	7 5 0	,,	,,
20×10 permanent green	10 5 0	,,	,,
16×8 ,, ,,	5 17 6	,,	,,

[See also page 225.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Proposed Public Offices	Aldershot U.D.C.	100*l.*, 75*l.*, and 50*l.*	Mar. 29
*New Market Hall	Market & Baths Com. Oldham Cpn	50*l.*, 30*l.*, and 20*l.*	April 8

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Sheds, Hillsborough	Sheffield Corporation	H. Sayer, Town Hall, Sheffield	Mar. 4
Warehouse, Shipley		Walker & Collison, Architects, Swan-arcade, Bradford	do.
Sewer, Galbraith-street	Glasgow Corporation	City Engineer, 64, Cochrane-street, Glasgow	do.
Alterations to Workhouse, Knutsford	Bucklow Guardians	R. M'Beath, Architect, Birnam House, Sale	do.
Four Houses, Lightcliffe, Halifax		R. Berry, Architect, Commercial-street, Halifax	do.
Street Works, Dame Flogan-street	Mansfield Corporation	R. F. Vallance, Borough Surveyor, White Hall, Chmbs, Mansfield	do.
Gas Buildings, North Shields	Tynemouth Gas Company	W. Hardie, Engineer, Gasworks, North Shields	do.
School, High-street, Pear Tree-green, Hants	St. Mary Extra, Sholing, &c., S. B.	Mitchell & Co., Architects, 9, Portland-street, Southampton	do.
Four Villas, Victoria-road, Barnstaple		W. C. Olliver, Architect, Barnstable	do.
Works and Materials	Wardle (Lancs) U.D.C.	V. Wilson, Surveyor, Council Offices, Wardle	do.
Widening Durham-road	Sunderland Corporation	Borough Engineer, Town Hall, Sunderland	Mar. 5
Cottage, Bratton Flemming, Barnstaple	Mr. B. T. Fanshawe	Smyth-Richards & Fox, 3, Castle-street, Barnstable	do.
Additions to Store, Undercliffe	Bradford Co-operative Society, Ltd	Rycroft & Firth, Architects, Manchester-road, Bradford	do.
Shed, Offices, &c., White Abbey Works, Bradford	Executors of H. Stead	G. Buckley & Son, Architects, Tower Chambers, Halifax	do.
Station House, Aldin Grange	North-Eastern Railway Company	W. Bell, Architect, Central Station, Newcastle	do.
Materials	Northampton R.D.C.	W. Tomalin, 14, Guildhall-road, Northampton	do.
Mortuary, &c.	Barrow-in-Furness Corporation	Borough Engineer, Town Hall, Barrow	do.
Reservoirs	Prestatyn U.D.C.	Beloe & Priest, Civil Engineers, 13, Harrington-street, Liverpool	do.
Seventeen Cottages	Lurgan (Ireland) R.D.C.	R. H. Dorman, Surveyor, Armagh	do.
House and three Cottages, near Staddlethorpe	North-Eastern Railway Company	W. Bell, Architect, York	do.
Road Diversion, West Stanley	do.	C. A. Harrison, Central Station, Newcastle	do.
Road Stone	Wrexham R.D.C.	J. O. Bury, 9, Temple-row, Wrexham	do.
Lodge Room, Pinner	Oddfellows Society	G. C. Ellement, North End, Pinner	do.
Additions to Schools, near Tamworth	Kingsbury School Board	J. W. Godderidge, Architect, Tamworth	do.
Church Work, Kirklinton, near Carlisle		J. H. Martindale, Architect, Viaduct Chambers, Carlisle	do.
Bridge over River Medlock, Clayton Vale	Manchester Corporation	City Surveyor, Town Hall, Manchester	do.
House, Shop, &c., Mapplewell, Yorks		Crawshaw & Wilkinson, Architects, 13, Regent-street, Barnsley	do.
Chapel and School, Earby, Yorks	Methodist Free Churches	J. Hartley, Architect, Swadford Chambers, Skipton	do.
Shop, Factory, &c., Springfield Mill, Farsley	Messrs. R. Gaunt & Sons	W. D. Gill, Architect, Summerville-terrace, Stanningley, Leeds	do.
Restoration of St. James' Church, Hereford		Nicholson & Hartree, Architects, Hereford	Mar. 6
Two Villas, Tannacliffe-road, Huddersfield		J. Kirk & Sons, Architects, Huddersfield	do.
Drainage Works, Rapier-street	Ipswich Corporation	E. Buckham, Borough Surveyor, Town Hall, Ipswich	do.
Retort House, Floor, &c., Albion-street	Salford Corporation	W. W. Woodward, Engineer, Gas Offices, Salford	do.
Granite, Lutterworth	Monks Kirby R.D.C.	J. C. Coates, Surveyor, Lutterworth	do.
Sewage Outfall Works, Thurnscoe	Doncaster R.D.C.	J. Simmons, Civil Engineer, Bank Chambers, Doncaster	do.
Three Houses, Goosebutt-street, Rotherham	Mr. H. Parkin	J. Platts, Architect, High-street, Rotherham	do.
Water Supply Works, Annan, N.B.		J. Barbour, Engineer, 53, Buccleuch-street, Dumfries	do.
Villas, &c., Tunnacliffe-rd., Ashenhurst, Huddersfield		J. Kirk & Sons, Architects, Huddersfield	do.
Masonry Piers, &c., Deepcar	Barnsley Corporation	T. & C. Hawksley, Civil Engineers, 30, George-street, S.W.	do.
Road Materials	Croydon Town Council	Borough Road Surveyor, Town Hall, Croydon	do.
*General Team Work (One or Three Years)	Hampstead Borough Council	Council's Engineer, Town Hall, Haverstock Hill, N.W.	do.
*Oak Fencing at Tooting Home	Wandsworth & Clapham Union	Clerk's Office, St. John's Hill, S.W.	do.
Stable, Leadgate, Durham	Dr. Henley	Dr. Henley, Front-street, Leadgate, Durham	Mar. 7
School	Lossiemouth (N.B.) School Board.	Reid & Wittel, Architects, Elgin	do.
Road Metal (8,500 tons)	Hull Corporation	A. E. White, Engineer, Town Hall, Hull	do.
Road Materials	Cheadle U.D.C.	E. Sykes, Civil Engineer, 9, High-street, Cheadle	do.
Sewerage Works, Brotherton	Pontefract R.D.C.	J. Waugh, Engineer, Tunbridge Chambers, Bradford	do.
*New Station Buildings, Hazelwell, near Birmingham	Midland Railway Company	Company's Architect, Cavendish House, Derby	do
Two Stone Bridges near Carlisle	Longtown R.D.C.	J. Murray, Surveyor, The Courts, Carlisle	Mar. 8
Sewers	Alford (Lincs) U.D.C.	F. Massey, Civil Engineer, Tetley House, Wakefield	do.
Conveniences, Priestpopple and Seal	Hexham U.D.C.	R. T. Surtees, Surveyor, Hexham	do.
Two Cottages, near Aberkenfig	Miss S. Morris	Hurley & Son, Architects, 10, Bridgend-road, Tondu, Wales	do.
Brook Diversion, Greenbank	Blackburn Corporation	W. Stubbs, Civil Engineer, Municipal Offices, Blackburn	do.
Alterations, &c., to Ida Cottage	Harrow-on-Hill U.D.C.	J. P. Bennetts, Engineer, Council Offices, Harrow	do.
*Two Hundred Barrel Maltings, Dublin	Messrs. A. & J. Tarlton, Tullamare	Messrs. Beckett & Metcalf, 10, Leinster-street, Dublin	do
Waterworks Extension, Gayton	Kings Lynn Corporation	H. J. Weaver, Engineer, Town Hall, King's Lynn	Mar. 10
Waterworks	Langport (Somt.) R.D.C.	Bailey, Denton & Co., Engineers, Palace Chambers, Westminster	do.
*Three Gates, with Wickets, &c., to Mortuary	Paddington Borough Council	Council's Surveyor, Town Hall, Harrow-road, W.	do.
*Supply of Articles and Execution of Works	Stepney Borough Council	Council's Engineer, 15, Great Alie-street, Whitechapel, E.	do.
*Asphalte Laying Works	do.	do.	do.
Police Station	Leeds Corporation	H. A. Chapman, Architect, East Parade, Leeds	do.
Police Station, Brampton, Cumberland		G. D. Oliver, Architect, 5, Lowther-street, Carlisle	do.
Restoration, Brynhellian Chapel, Dinas Cross	New Brentford Burial Board	Captain Peregrine, Smithfield-place, Dinas Cross, Wales	do.
Cottage, &c., Sutton-lane, Heston, Middlesex		Nowell, Parr, Kates, Architects, 5, Brent-road, Brentford	do.
Vicarage, Crosthwaite, Kendal		J. Bintley, Architect, 7, Lower-street, Kendal	do.
*Oak Fencing, Tar Paving Materials, Wood Paving Wks.	London County Council	Parks Department, 11, Regent-street, S.W.	do.
*Paving Jubilee-street and Turner-street	Metropolitan Borough of Stepney	Borough Engineer, 15, Great Alie-street, Whitechapel, E.	do.
*Electric Generating Station and Offices	West Ham Council	Borough Engineer, Town Hall, West Ham, E.	Mar. 11
*Supply of Railway Wagons	Cambrian Railways Company	Locomotive, &c., Superintendent, Oswestry	do.
Water Mains	Hertford Corporation	J. H. Jevons, Civil Engineer, Hertford	do.
Conduit	Hartlepool Gas and Water Co.	Engineer, Gas Offices, West Hartlepool	Mar. 12
Surveyor's Materials	Headington R.D.C.	L. Turner, Surveyor, Hartfield Cottage, New Headington	do.
Quartzite Road Metal	Tenterden (Kent) Town Council	W. L. C. Turner, Borough Surveyor, Town Hall, Tenterden	do.
Surveyor's Materials	Bingham (Notts) R.D.C.	R. H. Beaumont, Market-street, Bingham	do.
*Gate Porter's Lodge &c., Northern Fever Hospital	Metropolitan Asylums Board	Board's Office, Embankment, E.C.	Mar. 13
Alterations to Corporation Arms, Preston		Borough Surveyor, Town Hall, Preston	Mar. 14
*Foundations for Extension of Power Station	St. Pancras Borough Council	Electricity Department Offices, 57, Pratt-street, N.W.	do.
*Additions, &c., to Balham Branch Library	Wandsworth Borough Council	Council's Surveyor, 215, Balham High-road, S.W.	Mar. 15
Engine House, Dale-street (Contract No. 3)	Radcliffe (Lancs) U.D.C.	W. L. Rothwell, Engineer, Council Offices, Radcliffe	do
*New Hospital, Aughton, near Sheffield	South Rotherham Hospital Com.	J. D. Webster, Architect, 19, St. James-street, Sheffield	Mar. 17
*Road-Making, Paving and Lighting Works	Hanwell U.D.C.	Council's Surveyor, Church-road West, Hanwell, W.	do.
*Buildings for Infirmary, Knotty Ash	Liverpool Select Vestry	Kirby & Willink, Architects, 5, Cook-street, Liverpool	do.
*Extension of Union Workhouse	Newmarket Union	Holland & Sons, Architects, High-street, Newmarket	do.
Road Works, Raynham-road	Hertford Corporation	J. H. Jevons, Civil Engineer, Hertford	Mar. 18
*Sanitary Work, St. George's Workhouse	Southwark Union	G. D. Stevenson, Architect, 13 and 14, King-street, E.C.	Mar. 20
*Erection of School, Silver-road	Norwich School Board	C. J. Brown, Architect, Cathedral Offices, Norwich	Mar. 21
Sale Shops, &c., Castle-street, Sheffield	Messrs. A. Davy & Sons, Ltd.	Gibbs & Flockton, Architects, 15, St. James'-row, Sheffield	do
*Drainage Works	Chester County Asylum	County Architect, Newgate-street, Chester	Mar. 22
*Maintenance and Repair of Main Roads for 3 years	Kent County Council	County Surveyor, 86, Week-street, Maidstone	Mar. 24
*Additions, &c., to Isolation Hospital	Epsom U.D.C.	Council's Surveyor, Bromley Hurst, Church-street, Epsom	30
*New Cottages	Kent County Asylum	W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	Mar. 26
*Casual Wards, Eastfield-street, Limehouse	Stepney Union	F. R. Smith, Surveyor, 6, Great College-street, Westminster	Mar. 27
*Taking Down Church and Erecting New, nr. Romsey	Lady Ashburton	F. Bath, Architect, Crown Chambers, Salisbury	Mar. 29
*Laying Second Line of Pipes	Manchester Waterworks Com.	G. H. Hill & Sons, 3, Victoria-street, Westminster, S.W.	Mar. 31
*Additions to National Schools, &c., Weybridge, Surrey	The Rector and Managers	A. H. Ryan-Tenison, Architect, 12, Little College-street, S.W.	No date
*Municipal Buildings	Hereford Town Council	H. A. Cheers, Architect, Twickenham, W.	do
*New Infirmary for Women	Stratford-on-Avon Union	C. Smith & Son, Architects, 164, Friar-street, Reading	do.
*Block of Flats, South-West District	Mr. H. F. Young	— Grey, 11 and 12, Clement's-lane, E.C.	do.
Business Premises, High-street, &c., Loughborough		A. E. King, Architect, Baxtergate, Loughborough	do.
Public Hall, Forest Gate, E.		J. W. Acock, Architect, 14, Wormwood-street, E.C.	do.
Sewers, Crook-lane, Barnard Castle	Rotherham School Board	Pegg & De Burgh, Architects, 7, Market-place, Barnard Castle	do.
School, Templeborough		J. E. Knight, Architect, 33, College-street, Rotherham	do.
New Road, Parkgate, Cheshire		Earle & Co., 54, Brown-street, Manchester	do.
Two Houses, Maldon-road, Colchester		J. Prior, Architect, Westgate, Colchester	do.
Offices, Derwent-street, Derby	Messrs. Eggleston Bros.	J. T. Holford, Architect, 34, Cornmarket, Derby	do.
Villa, Haddington, N.B.		J. R. & E. E. Pearson, Architects, 27, Castle-street, Edinburgh	do.

[See also next page.

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PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Architectural Assistant	Willesden District Council	3*l.* 3*s.* per week	Mar. 11
*General Assistant (Borough Engineer's Department)	Barrow-in-Furness Corporation	100*l.* per annum	Mar. 12
*Clerk of the Works for New Reservoir	Ipswich Corporation	4*l.* 4*s.* per week	Mar. 18

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, p. iv. *Contracts*, pp. iv. vi. viii. x. xii. & xxiv. *Public Appointments*, xx. xxi. & xxiv.

PRICES CURRENT (*Continued*).

TILES.

	s.	d.	
Best plain red roofing tiles	41	6	per 1,000, at rly. depôt
Hip and valley tiles	3	7	per doz. ,, ,,
Best Broseley tiles	48	6	per 1,000 ,, ,,
Hip and valley tiles	4	0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57	6	per 1,000 ,, ,,
Do. ornamental Do.	60	0	,, ,, ,,
Hip tiles	4	0	per doz. ,, ,,
Valley tiles	3	9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50	9	per 1,000 ,, ,,
Hip tiles	4	1	per doz. ,, ,,
Valley tiles	3	8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 0 0
Deals: best 3 by 9	13 10 0	15 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	10 10 0	11 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2 in. by 4½ in. and 2 in by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft.)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
,, ,, 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg :— First white deals, 3 in. by 11 in.	14 0 0	15 0 0
,, ,, 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
,, ,, ,, 3 in. by 9 in.	12 0 0	13 0 0
,, ,, ,, battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
¾ in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6

Prepared Flooring— Per square.

1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

PRICES CURRENT (*Continued*).

JOISTS, GIRDERS, &c.

	In London, £ s. d.	or delivered Railway Vans, £ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Common Bars	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars"	10 10 0	- -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 15 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Sheet Iron, Galvanised, flat, best quality :— Ordinary sizes to 20 g.	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 10 0	10 0 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 5 0	- - -
Pipe in coils	14 15 0	- - -
Soil Pipe	17 5 0	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0	- - -
Thin ,,	0 1 1½	- - -
Copper nails ,,	0 1 1½	- - -
BRASS— Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths	3d. ,, ,,
26 oz. thirds	4½d. ,, ,,
,, fourths	4d. ,, ,,
32 oz. thirds	5½d. ,, ,,
,, fourths	5d. ,, ,,
Fluted sheet, 15 oz.	3d. ,, ,,
,, 21 ,,	4d. ,, ,,
⅛ Hartley's Rolled Plate	2d. ,, ,,
3/16 ,, ,, ,,	2½d. ,, ,,
¼ ,, ,, ,,	2¾d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 9
,, ,, ,, in barrels	,,	0 2 10
,, ,, ,, in drums	,,	0 3 0
Boiled ,, in pipes	,,	0 2 11
,, ,, ,, in barrels	,,	0 3 0
,, ,, ,, in drums	,,	0 3 2
Turpentine, in barrels	,,	0 2 6
,, in drums	,,	0 2 8
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	,,	20 10 0
Best Linseed Oil Putty	per cwt.	0 8 6
Stockholm Tar	per barrel	1 12 0

PRICES CURRENT (*Continued*).

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

J. S. M. (Amount should have been stated).

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* Denotes *accepted*. † Denotes *provisionally accepted*.

ANNALONG (Co. Down).—For the improvement of the harbour. Mr. James Heron, County Surveyor, Court House, Downpatrick, Co. Down :—

D. A. Jardine, Ballykinlar, Clough, Co. Down £2,379 13 3

DYSART.—Accepted for the formation of a sewer on Dysart-road, for Dysart Burgh Town Council. Mr. D. Forbes Smith, surveyor :—

Alexander Fraser, jun., Pathhead.... £240 6 10

HARROW. — For new roads, Bessboro' Estate, Harrow :—

Neave & Son	£1,313 5 0	Free & Sons, Maidenhead*	£969 0 0
T. Adams	1,036 19 9	Wilson, Border, & Co.	860 7 6
Mann	1,024 2 6	Meston & Hale	724 14 6
Hollingsworth	1,008 10 0		
Clift Ford	993 0 0		
Wimpey & Co.	370 17 6		

KIRKCALDY.—Accepted for the erection of houses in St. Clair-street, Sinclairtown, for Messrs. Henry & Peter Kilgour. Mr. D. Forbes Smith, architect :—

Masonry.—Hy. Masterton, Sinclairtown	£728 14 8
Joinery.—G. Hav & Son, Dysart	492 12 0
Plastering.—J. Williamson & Son, Burntisland	144 11 6
Slating.—J. Williamson & Son, Burntisland	60 5 0
Plumbing.—Blyth & Dougall, Sinclairtown	74 10 6
Total	£1,500 13 8

LONDON.—For widening London Bridge for the Corporation. Mr. Andrew Murray, City Surveyor, Guildhall, London, E.C. :—

Pethick Bros., Plymouth..... £95,484 12 5

[*See also next page.*

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LONDON.—For new shop window to No. 11, Westbourne-grove, and alterations to Nos. 5 to 17, Westbourne-grove, for Mr. Henry Dobb. Messrs. Barrett & Driver, architects, 53, Blomfield-road, Maida Vale, W. :—

W. H. Lascelles	£584	Haskins & Bros.	£422
Drew & Co.	466	Cadman & Son‡	415
Sage & Co.	459		

‡ Recommended for acceptance.

LONDON.—For retaining wall to house, Frognal, Hampstead, for Mr. Henry Dobb. Messrs. Barrett & Driver, architects, Blomfield-road, Maida Vale, W. :—

J. Russell	£325	G. Neal, Kilburn‡	£253

‡ Recommended for acceptance.

LONDON.—For the erection of Siddons and Stirling Buildings, Russell-court, Drury-lane, for the London County Council :—

		Including Graining of Internal Woodwork.
Barker & Co.	£17,823	£17,954 13 0
Prestige & Co.	17,173	17,420 10 0
Spencer, Santo, & Co.	16,575	16,715 0 0
Holloway Bros.	16,566	16,645 0 0
Martin, Wells, & Co.	16,109	16,413 18 3
Stimpson & Co.	16,000	16,212 9 9
H. L. Holloway‡	15,537	15,757 0 0

‡ Recommended for acceptance.

LONDON.—For the erection of Sylva-cottages, Mill-lane, Deptford, for the London County Council :—

F. & T. Thorne	£5,833 7 9
Barker & Co.	5,812 0 0
Spencer, Santo, & Co.	5,216 0 0
Holloway Bros.	5,011 0 0
Stimpson & Co.	5,000 0 0
Martin, Wells, & Co.	4,904 0 0
H. L. Holloway‡	4,767 0 0

‡ Recommended for acceptance.

PUTNEY.—For the erection of four shops in Upper Richmond-road, Putney, for Mr. Thos. McIsaac. Mr. J. C. Radford, architect and surveyor, 163, Upper Richmond-road, Putney :—

W. J. Renshaw	£5,991	W. Bishop	£5,450
H. Roffey	5,772	Parsons & Co.	5,411
Adamson & Sons	5,725	F. G. Minter	5,178
J. Knight	5,475	Read & Wilkinson	4,997

SALFORD.—For the erection of a fire station, The Crescent, for the Corporation. Mr. Henry Kirkley, architect, 134, Deansgate, Manchester. Quantities by Mr. C. Bagot, 134, Deansgate, Manchester :—

Gerrard & Sons, Ltd.	£23,500	Peters & Sons	£21,888
J. Byrom	23,341	W. Healey	21,846
Hill & Hey	22,950	Brown & Son	21,790
Southern & Sons	22,898	Burgess & Galt	21,500
J. Ramsbottom	22,578	Bullivant & Sons, Manchester*	20,950
Daniels & Sons	22,500		

* Accepted subject to confirmation by Council.
[Architect's approximate cost £22,235]

SOUTHEND.—For new cemetery chapel, Sutton-road, Southend-on-Sea, for the Southend Church League. Mr. S. I. Adams, architect and surveyor, Southend :—

Sumpter Bros.	£987	Dupont	£580
Moss	615	Harris & Roe, Shoebury*	540
F. & E. Davey	610	W. E. Davey	535
Whur	597		

WALLINGTON.—For excavation works, Wallington. Messrs. Warran & Stupart, architects and surveyors, Green-lanes, Harringay, N. :—

E. Iles	£1,062 10	Streeter Bros.	£425 0
H. Boyer	750 0	R. Clarke	350 0
A. C. Soan	655 0	R. Palmer, 6, Belmont Park-crescent, Leyton*	135 17
Kavanagh & Co.	562 10		
J. Martyn	520 0		

WALLINGTON.—For the construction of about one mile of new roads, with sewers and storm-water drains complete, on the Woodcote Estate, Wallington, for the Imperial Property Investment Co., Ltd. Mr. W. J. Parker, surveyor, 38, Great James-street, W. :—

J. Dunmore	£7,459	T. Cotterill	£6,785
Neave & Son	6,964	Adams, Wood Green*	5,772

WALLINGTON.—For detached house, Wallington, Surrey, for Mr. J. D. Meredith, and under the supervision of Mr. Arthur L. Dartnell, architect and surveyor, Bank Chambers, 73, North End, Croydon :—

E. Spencer	£820 0 0	Ludlow & Martin	£598 0 0
G. Rabbetts	696 17 6	W. Roberts, Dennett-road*	592 0 0
Cronk & Richardson	687 15 0	T. W. Sedgwick	529 0 0

WHITLEY (Northd.).—For the execution of street works, Monkseaton Building Estate, for the Urban District Council. Mr. J. P. Spencer, C.E., Newcastle-on-Tyne :—

Thornton & Co., South Shields,* schedule of prices.

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VOL. LXXXII.—No. 3083. MARCH 8, 1902.

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Design for a Pulpit, to be Executed in Marble..... By Mr. F. Winton Newman.
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Ancient Monuments in Modern Italy.

ART and archæology do not often come into Royal Addresses, but such an innovation in government procedure occurs in the Speech from the Throne of the young King of Italy, delivered at the opening of the Legislature in Rome last week.

Amongst the many weighty affairs of State proposed to be discusssed during the forthcoming session of the Italian Parliament—weighty with the responsibilities of reviving enterprise, flourishing finance, and the general prosperity of the country—space is found for Roman improvements, further extensive alterations at Naples, and (what is of greater interest to the general educated public) a development of the conservative principles affecting public monuments which have become so remarkable during the last few years in Italy. The King intimates in his Speech that the whole peninsula is to be brought under the Government organisation already established for preserving works of artistic and historical interest, which at present seems to be confined to the more northern provinces. This admirable institution of recent years, although not the only body representing a national interest in the preservation of antiquities, is the responsible government authority in such matters, wherever it has been inaugurated, and it influences and controls to some extent the less important local societies. In Italy these local societies, although founded for the purpose of popularising the study and care of national history, are frequently swayed by local interests, and even, strange as it may seem, by political considerations, and occasionally their influence is anything but conservative. In the case of a country such as Italy, many parts of which are still in a comparatively barbarous state, and where a very superficial education in the richer classes of the community is just sufficient to induce a desire for what is called "restoration" or renovation of the public monuments, such an institution as the "Ufficio per la Conservazione dei Monumenti" is evidently of immense value.

Forty years ago, in the days of the "Unification" of Italy, laws for the preservation of national monuments were perhaps of greater necessity than even at present. The mutilation of statues and other monuments in public places, which expressed the political changes in a particularly brutal manner, would hardly be permitted at the present day on the score of the commonest public decency. Not merely the erasure of historic inscriptions referring to bygone institutions, but often the most disgraceful vulgarity was perpetrated, such as the conversion of a bronze colossal statue of one of the popes into a patron saint of the town, at Rimini, by the substitution of a rudely-formed episcopal mitre in place of the tiara, with a clumsy representation of a crozier in one hand, the whole transformation the work of some common blacksmith, who must have been employed by the baser part of the community thus to disfigure the town. Numerous were the instances in those days of such malpractices, committed by municipal and other authorities for the purposes of currying favour with an uneducated democracy, and eager to commemorate their terms of office by some unnecessary change in the aspect of the towns they had to do with.

At the present moment a certain class of ancient monuments is attracting a great deal of attention in Italy. The ancient town-walls have been hitherto retained in a remarkable degree of completeness, partly on account of the manifest uselessness of pulling them down, and partly—or, perhaps, chiefly—because they happened to remain in use as Octroi boundaries, long after their original intention as fortifications had disappeared. Hitherto these ancient walls have formed one of the most characteristic and picturesque features connected with the old Italian cities, and their gradual disappearance will detract materially from the old-world charm of the peninsula. In some of the cities a vigorous effort is being made for their preservation, but it can hardly be expected that mere sentimental reasons for their retention can weigh against the speculative money-making interests involved in the conversion of their sites to other purposes. Rome still retains its ancient wall, of untold associations, almost complete. Florence lost hers in 1860-1870, when the Octroi boundary was pushed much farther out into the country; Milan retains the greater portion of its sixteenth century fortifications, crowned with beautiful horse-chestnuts, and affording the pleasantest of promenades.

The citizens of Bologna and Genoa are now deciding to remove these boundaries of their past history, in spite of a determined protest in each case on the part of certain dissentients who find a great deal to say on the subject in the local daily journals. In the case of Bologna a great deal may be urged against the destruction of the wall. It is quite unnecessary on the score of enlarging the city, as there are large tracts of unoccupied ground still within it. The only excuse for its removal which can be urged by the party of destruction, is that the city will thereby be modernised. In other words, the object in view is to do away with one of the special features which render an old Italian town different from anything of the kind to be found in other countries. This must, of course, in time seriously affect that large section of the townspeople which lives on profits derived from the tourists and visitors, whose only attraction to such a place as Bologna is its old-world character. But the misdirected ambitions and the ceaseless modern craving for something new, which have affected Italian municipalities ever since 1870, are now inducing the Bolognese to this stupidity, to be regretted by every one except the contractors secure of an immediate profit out of the job, and the Town Councillors who vainly imagine that their interests and their popularity may be increased thereby. At a recent meeting of the Town Council it was decided to carry out this piece of destruction, in defiance of the efforts of the Conservative Party, headed by Signor Rubbiani. The deed may, however, be still averted through the action of the Department for Preserving National Monuments, and it is in such cases as this that fuller and more adequate powers seem to be required by the Government for dealing with the historical memorials of the country, as referred to in the King's recent Speech.

Genoa does not depend for its interest to the passing visitor so much on historical memorials as Bologna. The mediæval aspect of the city, which is so striking and complete in the case of Bologna, is absent in the great maritime city. Genoa lost

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its mediæval walls ages ago, and the fortifications which are to be demolished are comparatively modern, although long out of date, as such things go. Genoa, whilst losing a great deal of its old-world imposing character, with the massive stone-sheathed earthworks of the seventeenth century, will always remain one of the most beautiful of cities, occupying one of the most striking sites in the world. Bologna, on the contrary, deprived of its mediæval character, would not attract a single visitor of the thousands who annually stay over a few nights, to explore its endless arcaded streets within the ancient brick wall which has protected them for so many centuries from the bitter "tramontana" wind sweeping over the ugly flat Lombard plain.

THE LONDON WATER BILL.

AFTER two days' debate the second reading of the London Water Bill was carried on Monday last by a majority of eighty-six. The debate was extremely unsatisfactory, and exhibited dissatisfaction in regard to the measure and a great deal of public indifference. The want of that municipal spirit which is so clearly to be seen in the great provincial towns has never been more clearly evident than in regard to this London Water Bill. The feeling among large masses of London ratepayers is that they will have to pay as much in rates in the future as to the water companies in the past, and so long as they get a reasonable supply of water they are indifferent whether it comes from a municipal or a private supply. In Birmingham or any other large provincial town there would be a sense of satisfaction that the supply of this primary article in the necessities of daily life was to be undertaken by the local community. Londoners would be quite as satisfied if Mr. Yerkes or some other enterprising American would take over the whole business and supply them with plenty of water at a cheap rate.

Mr. Buxton, in moving an amendment to the effect that the authority to be created is unsatisfactory, and unworkable, and repugnant to the general principle of municipal government, made an attack on the bill which, either from a municipal or a business point of view, was unanswerable. A body entrusted with the management of the water supply, if it is to be a separate body, should be directly elected by the ratepayers. For it has been demonstrated over and over again that it is only by means of direct representation that a proper check can be placed on financial management or that efficiency can be kept up. The ingenious and indirect election of the members of the proposed Water Trust could only be worked by an American "boss," and unless there is to be direct representation, the members of the Water Trust might just as well be a body nominated by the Government. Most people in London, however, having so little municipal spirit, will look at the Water Trust from a business point of view, and there is no man in the city of London who would not consider this huge body of over sixty members far too large. No doubt the area of the water supply is considerable, but it does not follow from that that the numbers of those who have to manage what is really a business should therefore be larger on those principles. The Board of the Canadian Pacific Railway should, on that principle, be about fifty times as numerous as that of the London and North-Western Railway. The new Water Trust will be in exactly the same position as a large joint stock company; in fact, its name of "Trust" would be perfectly understood in America if it were a private society. A private Water Trust—and such a thing would have been by no means outside the bounds of probability—to supply London and the suburbs with water, would have been managed by a Board of ten or twelve business men, under whom would have been a number of competent permanent officials. The unwieldy body which is to be created by this Bill will inevitably result in the work being done by a small proportion of active members. One speaker in the debate said that the number of representatives would enable several local committees to be formed, but there can be no need for such local committees, since the supervision and management of local areas must necessarily be under the charge of local water engineers. There is no analogy between, for example, a case of local schools or local asylums and a local reservoir with its supply pipes, and nothing was said in the debate which could for a moment justify the creation of such a Water Trust as is proposed by the Bill, except the desire to prevent the London County Council from having the control of the supply.

On the other hand, the Bill is frankly disliked by the water companies. Mr. Boulnois led the opposition on behalf of the companies. It is really unnecessary to consider his objections in detail to the measure, because the gist of his opposition was revealed in a single sentence—"The purchase," he said, "was inadvisable altogether, and the Bill was unnecessary." From that point of view it was perfectly reasonable to object to the proposed tribunal of arbitration, to the time at which the companies should be taken over by the new Trust, and to the absence of any compensation for compulsory purchase. As regards the absence of the 10 per cent. compensation for compulsory purchase, we can only say that we should be glad to see the same absence in many other Bills; for if a fair compensation is given when an undertaking is purchased by compulsion, there is really no reason whatever why the holder of stock or the owner of land should receive more than if he sold it voluntarily, and we hope that this departure from what has been called the principle of the Land's Clauses Act will become a precedent in future statutes.

The real advance made by the Bill, as was pointed out by Mr. Asquith in his admirable speech on Tuesday, is the recognition by a Conservative Government of the principle of public control of the water-supply of London. Beyond this, the Bill is weak in its conception. It has now to pass through the ordeal of an investigation by a Joint Committee of the Lords and Commons, a tribunal which, as Mr. Long pointed out, would save the expenses of a double investigation. We fear that the cumbersome governing body can scarcely be radically altered by the Committee; but we hope, with Mr. Asquith, that it will make it clear that the stockholders in the water companies will, in the first place, have a cash valuation, and not a mere transfer of water stock, though that may, after such valuation, be given to them in place of cash. For, as Mr. Asquith pointed out, the credit of the new authority will be high, and their stock will be of proportionately higher cash value in the market. In truth the really important discussion of the Bill has yet to take place, and it will be interesting to note its fate before the Joint Committee.

THE LATE MR. BENTLEY.

IT was by a sad coincidence that the news of the unexpected death of Mr. J. F. Bentley was made public on the morning of the day when it was to have been announced at the Institute of Architects meeting that the Gold Medal had been awarded him this year—as indeed it could not well have been otherwise awarded. This is the third tragic fatality in the architectural profession during a very recent period.

By his death we lose a man who to the comparatively few who were acquainted with his work had long been known as a true artist, though it is only his great building at Westminster which has brought him something like public fame. Mr. Bentley was in fact so retiring and reserved a man that it was difficult for any but a few friends to know much about him; but he was an example of an architect (there are not too many of them) whose thoughts and endeavours were given rather to the perfecting of his work than to either emoluments or public notice. It has been related to us that when in his earlier days he had been selected as architect for a proposed church, the committee, after waiting some time, wrote to him to ask when the design would be ready, but received the reply that he had not yet satisfied himself with it. After waiting some time longer a second appeal was made, coupled with an intimation that if he kept them longer they might feel it necessary to go to another architect. Bentley's reply was that he could not send in a design until he was entirely satisfied that it was the best he could do; but added that if they wished to go to another architect he was quite content that they should do so. This we may take to be typical of the spirit in which he worked. When a friend congratulated him on the fact that the Institute had decided to offer him their Gold Medal, he replied—"Such things are not in my line; I do not appreciate these honours in the least; but (he added very emphatically) I do appreciate the good will of my brother architects in presenting it to me."

The following extract from a letter sent to us by a younger architect, is interesting as throwing light on Mr. Bentley's real character, which no doubt was often misunderstood owing to his reserve and a certain brusquerie of manner:—

"My first introduction to him was nearly five years ago on a little matter of private business, when, in reply to a letter of mine asking for some concession, I received a reply in such curt and uncompromising terms as—much as I wished to meet him—made me hesitate long before screwing up courage to do so. Upon meeting him, he received me very much in the spirit indicated by his letter. Any attempt at discussion was futile, and we eventually arranged our business on his own terms. Much to my surprise, however, no sooner was this accomplished than he voluntarily made nearly the whole concession I had asked for, and before our interview was at

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an end (it did not last more than ten or fifteen minutes) I had quite thrown over my previous impressions of his character, for from being absolutely impassive and reserved he seemed to change to a friend of years' standing, giving me the most kindly advice and good wishes as well as encouragement as to the future. This was the side of his character I saw to nearly the day of his death, my last meeting with him being less than a week previous to that sad event. I met him frequently, and never without some kind inquiry on his part, and when it was my good fortune to be able to tell him of some little success, his expression of pleasure and congratulation were most tender, and such as one might expect from a father to his son.

During the last year or two he found such difficulty in speaking that I would sometimes attempt to pass him to save him the pain of a conversation, but seldom would he allow this."

We have given in another column a list of Mr. Bentley's principal buildings. Many even of his architectural friends were possibly not aware that he was also a most gifted and original designer in silver work and church plate, a side of his work which was beautifully illustrated in the design for the presentation casket to Sir Stuart Knill, illustrated in the *Builder* of May 11, 1895. His great cathedral building, if completed according to his intention, will remain his principal monument, and is a building remarkable both for its general grouping and for the finish and originality of its details. As one or two of our readers have expressed surprise at our apparently neglecting till recently this remarkable building in our illustration pages, we may take the opportunity of saying that this was due to no indifference on our part, but to deference to the wishes of the architect. Three years ago we endeavoured to move him to supply us with materials for a perspective view of the exterior as it would ultimately appear, but he expressed his wish that any illustration of the exterior should be deferred until one could also be given of the interior, so that the two might be judged together; a wish which, of course, we could only respect. During the last few months he relaxed this embargo so far as to accede to the illustration of portions of the exterior, one of which was given in our New Year's number, and another will appear in our next issue.

Mr. Bentley was a devout Catholic, and it was among his co-religionists that his chief practice lay. He was interred on Wednesday at St. Mary's, Clapham, with a solemn Requiem service, when Cardinal Vaughan gave an address on his life, his work, and his sterling qualities, referred to his lack of ambition for worldly fame, and characterised him as a thorough artist, whose first principle was to serve and be loyal to his art, and as a good Christian.

NOTES.

Chelsea Baths Competition.

THERE appears to have been something very unsatisfactory, and perhaps deserving a stronger term, about the conduct of the competition for new baths for the Chelsea Vestry. The Vestry made a mistake in the first instance in selecting Mr. Norman Shaw to act as assessor, since it is not at all probable that he has any special acquaintance with the requirements of public baths, or would be likely to give his attention to anything except the architectural appearance of the designs; which, though certainly not unimportant, should hardly be the first consideration in a building of that kind. Having chosen their assessor, however, they were bound at least to have awarded the premiums according to his recommendation, even if they did not select one of these designs to be carried out. They have, however, thrown over all Mr. Shaw's awards, and given the premiums as they pleased; thus at once breaking faith with the competing architects and throwing a slight on the distinguished architect whom they had selected as assessor. We may further ask why, since the drawings were publicly exhibited, we received no notice of the fact, as we usually do in such a case, from the secretary or clerk to the Committee? To a request for an explanation of this omission we have received no reply, and naturally draw our own conclusions.

The Widening of London Bridge.

WE understand that the Court of Common Council have adopted a report made by their Bridge House Estates Committee recommending the acceptance of a tender by Messrs. Pethick Bros., of Plymouth, for 95,489*l.* That amount will be defrayed out of the funds belonging to the Bridge House Estates. Mr. Andrew Murray, City Surveyor, is the architect for the works, which, it is stated, will be executed in Devonshire granite. A statement prepared by Sir John Rennie, who, with his brother George, completed the present structure after the death, in 1821, of their father, John Rennie, sets forth that it was built of the finest blue and white granite, containing large white felspar crystals, obtained from Devonshire and Scotland, and that the whole sum paid to the contractors, Jolliffe & Banks, was 425,081*l.* 9s. 2d., the total expenditure, including approaches, having been 1,458,311*l.* 8s. 11¾d. (The noting of the farthings in this large sum is curious.) We fear we must now conclude that what we do not hesitate to call the disfigurement of London Bridge, to meet a necessity much more imaginary than real, is definitely decided on, in spite of the fact, shown by statistics, that the traffic over the bridge is actually less than it was a few years ago. It is a foolish piece of business to interfere with and spoil one of the most remarkable bridges in the world, without any proved necessity, and against the opinion even of the eminent engineer who was called in to advise upon it.

Some Electrical Developments.

LORD RAYLEIGH gave his third lecture on "Some Electrical Developments" at the Royal Institution on Saturday afternoon. He first of all explained in what direction a spherical ball of iron moves when placed in a magnetic field, and gave, by means of a powerful electro-magnet, a demonstration that it always moves to the place where it will be magnetised most strongly. He then showed a very simple form of synchronous motor which he had constructed long before electricians had developed the modern alternating current motor. It consisted of an iron disc which was rotated between the poles of an electro-magnet excited by a current made intermittent by a mercury cup tuning fork interrupter. When the tuning fork was viewed through holes cut in the disc it appeared absolutely stationary, thus showing that the motion was synchronous. We were interested to learn that this stroboscopic method of studying the instantaneous positions of a moving body, which we thought had been developed during the last few years, had been used by the lecturer many years ago. The behaviour of iron under small magnetising forces was next described, and a beautifully simple demonstration of it was given by the Rayleigh method. A small steel magnet was acted on by two coils, one containing an iron core, which were connected in series, and it was proved that magnetisation was proportional to the magnetising force so long as that force was not greater than one-fifth of the earth's horizontal magnetic force. It seems to us that this result is of great importance in several of the problems of wireless telegraphy. Lord Rayleigh mentioned that he had found that unannealed iron wire always acted in a perfectly definite manner when subjected to magnetic force, but that annealed iron behaved erratically, the amount of magnetism induced depending on the time the force was applied. This has an important application to telephony. He mentioned that Tait and Preece had much exaggerated the sensitivity of the telephone He had found that the minimum audible current was ten thousand times greater than that stated by them. The error in their measurements was due to neglecting the capacity of the resistances used. He exposed the fallacy that a magnetised ring was a store of energy. A striking demonstration was given of the power of an electric brush discharge to dissipate smoke and dust. A large glass vessel was filled with phosphorus smoke and a wire connected to a terminal of a Wimshurst's machine was placed inside it. A few turns of the handle were sufficient to clear the vessel of smoke, for the various particles of smoke becoming electrified, attract one another and form groups which fall under gravity.

Electric Shocks.

PAPERS on "electric shocks" were read at the Institution of Electrical Engineers last week by General Webber, Mr. Aspinall, and Mr. Trotter, the Electrical Advisor to the Board of Trade. General Webber first discussed the scientific aspect of the question, he then went on to describe the events which led to the inclusion of electrical generating stations in factory legislation, and concluded by quoting in full and criticising the regulations proposed five years ago by the Home Office Committee on Dangerous Trades. Mr. Aspinall's paper, although it was rather gruesome, was a valuable contribution to our knowledge. He gave reasons for supposing that persons suffering from certain diseases were more susceptible to shock than others. He pointed out the importance of the path the current takes, and stated that although he had been present in three cases where a doctor was called in to attend a man who had received a severe shock, yet he had never been asked where the current entered and left the body. We are in entire agreement with Mr. Aspinall's conclusions that when the electric pressure is below 600 volts the conditions must be abnormally favourable to shock in order to cause death. Mr. Trotter described a series of experiments he had undertaken to find the maximum possible shock that could be received without unpleasant after effects. In our opinion he minimised too much the danger from shock. It is the untoward

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cases we have to guard against. For example, we know a healthy young electrician who has received many shocks of 500 volts and upwards in the test-room in his every-day work and merely laughed at them, yet, inadvertently putting his hand on a Ferranti meter, in the cellar of a private house supplied with current by a London Vestry, he received a shock which seriously hurt him. We think that the public ought to be protected by the Board of Trade from severe shocks, even although many people can stand these shocks with impunity.

Old Remains at St. James's Palace.

IN the course of some excavations that are being made in the cellarage on the west side of the Colour-court have been found a considerable quantity of human bones and a leaden coffin with its contents—the coffin being in the old and not unfamiliar shape, somewhat on the lines of the human form. The discovery may be accounted for when we recall that the palace occupies the site of a lazar hospital for lepers (women), founded and dedicated to St. James by the citizens of London in the eleventh century, and to which Edward I. granted, in 1290, the privilege of a yearly seven days' fair. Berking, the reforming Abbot of Westminster, 1222-1245, had rebuilt the hospital. In 1450 Henry VI. bestowed its perpetual custody upon Eton College. In 1532 Henry VIII, on marrying Anne Boleyn, exchanged Chattisham, and other lands in Suffolk, for the hospital. He pensioned the sisterhood, dismissed the lay-brethren, and, as Holinshed records—

"Purchased all the meadows about St. James's, and there made a fair mansion and a park for his greater commodity and pleasure."

Henry VIII. also annexed the present St. James's Park, which he encompassed with a brick wall. Thomas Cromwell, Earl of Essex, superintended the building of the new "manor-house," as it was then called, and Holbein, reputedly, made the plans and designs. Of the former palace, occupied by Henry VIII. until he obtained Whitehall from Wolsey, there remain the gate-house, through which one enters the Colour-court; the chapel, in which Sir Christopher Wren, on February 29, 1676, married his second wife, Jane, daughter of William, second Baron Fitzwilliam, and in one of the state rooms a stone Tudor arch over the fireplace sculptured with the initial letters "H. A." united with a lover's knot surmounted with a royal crown, and with the rose of Lancaster, the lily of France, and the portcullis of Westminster. Timbs mentions that in 1838 were dug up from beneath the chapel various fragments of masonry of the former hospital. The survey of the palace and Capuchin convent, made in 1689 for the rare pamphlet cited in our "Note" of August 10 last, plots "a burying place" in the ground where is now the open space of Friary-court, and the "cloisters" abutting against the east end of Queen Henrietta Maria's Roman Catholic chapel; that later burying place, however, should not be confused with the site we speak of above, which lies some yards to the west of Friary-court, and in a separate part of the palace.

Launceston Castle.

THE Town Council of Launceston have agreed to take a thirty years' lease of the castle grounds from the Duchy of Cornwall, at an annual rent of 5/., and to preserve and maintain the ruins, with the pleasure-grounds around. The walks and gardens were laid out in the old precincts after the removal of the Assizes to Bodmin in 1838, and the consequent dismantling of the modern gaol, the hall, chambers, and chapel. The castle, which is cited in the Domesday Survey, was built upon a steep and lofty eminence washed by the Kinsey, a tributary of the Tamar. The main entrance, across the moat, was on the west side, but in 1834 a new approach was made. The main wall extends from the east gate to the Witches' Tower, which fell down at the construction of the new road. The keep stands upon a partly artificial mound, and is gained by a flight of steps. It consists of a round tower, some 32 ft. high, built of hard blue stone, and containing two staircases. King John bestowed upon Hubert de Burgh the wardship of the castle, which afterwards was granted to the Dukes of Northumberland, together with the office of Constable of Launceston. During the Civil War the castle was held in various turns by both parties, and in the end Colonel Basset surrendered it to Fairfax in March, 1646. During the Commonwealth, the Parliament sold the castle (wherein George Fox was imprisoned in 1656) and its precincts to Robert Bennet, but they reverted to the Crown at the Restoration.

Pictures of the Holy Land.

AT the Fine Art Society's Gallery there is on view a very interesting collection of pictures and studies of landscape and architecture in the Holy Land, from Hebron to the Lake of Galilee, by Mr. John Fulleylove. They are perhaps as interesting in a topographical as in an artistic sense—the view evidently taken by the majority of visitors, who care more about sacred associations than art; they do not present many opportunities for the class of subject in which Mr. Fulleylove has made his special success. Some of those which are mainly landscape subjects are however very charming; "The South Wall of Jerusalem from Siloam" for instance (65), a very bright and clear early morning effect, and the view of the arid and dreary landscape of the Judæan desert (72). Among those in which architecture takes a prominent place one of the best is the large view of "The Pool of Hezekiah" (32). The exterior view of the Mosque of Omar (16) gives a very vivid and complete idea of the colour and aspect of the building; and there are a good many others which will be of considerable interest to architects. No apology was required for the pencil sketches; from an architectural point of view they are among the best things there, as may be recognised on comparing the water-colour drawing of the "Entrance to the Church of the Holy Sepulchre" (74) with the pencil drawing of the same subject (43). The latter will certainly be preferred by architects, though not perhaps by others.

Pastels of Mr. A. Hitchens

MESSRS. WALKER'S small and not very well-lighted gallery at No. 181, New Bond-street, contains a collection of Pastels by Mr. Alfred Hitchens which are worth a visit. The majority are small landscapes, most of them very good examples of the kind of effect which pastel can best deal with. Among those which are especially successful are "The Eve Before the Mowing" (9) and "A Lonely Heath, Burnham" (22), the latter an ideal pastel subject. Mr. Hitchens also exhibits some very good portraits and studies of heads in pastel.

DESIGN IN FURNITURE.*

IF we may judge from the least developed races now inhabiting the globe, furniture in its widest sense may almost be said to be of more primitive necessity to man than building. The tribes of Central Australia may be taken as an example of this, among whom we find quite a diversity of utensils and implements, some of which have rude attempts at ornament, while their only endeavour towards building (if one may so call it) seems to be a rough hut of boughs of trees.

To clear the ground it will be well to start with definitions:—

1. What do we mean by design? and
2. What is it we include under the term furniture?

1. By design, I take it, we mean that quality which marks any object to which it is applied as having received thought in its conception; and, further, as having suitability for the function for which it was intended. From the just combination of thought and suitability arises true beauty.

2. The word "furniture" embraces all those articles which we need in our daily domestic life for use, comfort, or joy.

During the most ancient historic times we have evidence that furniture, upon which much thought and care had been expended, was in use; and many remains of it have come down to our day. As the stream of time flowed on, and man's needs and luxuries increased, the variety of the pieces of furniture he required in life increased in equal proportion, until to-day their number is immense.

The field has become so vast, indeed, that we talk now of church furniture, garden furniture, and so on, each branch demanding the accurate knowledge of a specialist. It is domestic furniture that I have primarily in my mind to-night, for (if I may say so) it is domestic furniture that most needs the quality of design applied to it in our present day. I do not for one moment overlook the great awakening that is taking place; but the mass to be leavened is very great, and I am not quite sure that the designers are following the ideal road. At any rate, there are two dangers, at least, which beset the path of the twentieth century designer: first, eccentricity and second antiquarianism. In striving to avoid the deadly monotony of the average furniture and arrive at something more original, it is so easy to fall into the first fault—eccentricity.

As a recoil the beauty of much old furniture is apt to reduce us into mere reproduction of the work of other days. We study the past to live the present; may I, therefore, very briefly run over a few points of the history of furniture, which, perhaps, will help us to consider what should be our attitude to-day as regards the matter.

The remains we have of the furniture of very ancient times are too few (and often fragmentary) to allow us to generalise from them; not to mention that the state of society then was widely divergent from modern days, so that we cannot learn many lessons from the productions of those times. Of the period of the Renaissance in Italy, we have remaining wonderful dower chests and jewel caskets of carved wood, gilded and decorated in colour, mottos and armorial bearings being introduced, and sometimes the panels are formed by painted scenes.

We also still see in the old Italian palaces rows of stately chairs ornamented with carving and inlay, and tables whose tops are formed of a slab of more or less precious marble; and doubtless many of these are ancient, or their design is based on a traditional treatment. These accord well with the formal solemnity of the State apartments they furnish, and have much fine work in them, although the general effect is somewhat too ornate. Although not strictly, perhaps, belonging to our subject to-night, I would mention, in passing, that some of the fabrics used for covering the

* A paper by Mr. Vivian H. King, read before the Discussion Section of the Architectural Association on the 28th ult.

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cushions of these chairs are worthy of careful inspection. I remember in the Palazzi Massimi in Rome seeing some chairs, the covering of which was white leather, having an appliqué of velvet and gold thread, the finer portions of the pattern being filled in by point embroidery in coloured silks.

When the Renaissance began to touch us in England, at the latter end of the Tudor period, our intercourse with Holland was considerable, and we find this reflected in the furniture of that time, for, though founded on classic forms, these are often bizarre, the later designs becoming more florid. The number of pieces required at this date were not many—chairs, standing cupboards, and large tables with massive legs almost exhausting the list. Under the early Stuarts the lines are perhaps more severe, and the carving (which was much used and very characteristic) was of low relief. Often almost the entire surface was thus covered, a very usual arrangement being a series of panels, formed with semi-circular arched heads supported on pilasters, which latter formed the divisions between one panel and the next. The ground of the panel thus obtained was carved, sometimes with figures but more usually with conventional foliage, the background being worked all over in some manner —small drilled holes or the like. Such panels formed the backs of chairs, the doors of cupboards, the footboards and heads of four-post bedsteads, &c. The distinctive nature of the carving, and the ease with which it can be imitated, has lead to many modern copyists trying to produce so-called Jacobean furniture.

Towards the end of the seventeenth century and in the early days of the eighteenth we first find productions which seem in touch with modern ideas of comfort. The use of more varied woods came into vogue, and inlay as a method of decoration was carried to great perfection. (As a note by the way, the wonderful *intarsiatura* seen in Italy will occur to all of you) The bowed legs and claw or ball feet to chairs and tables mark this time, also a greater attention to the ease of persons using the chairs, shown by the inclination of back, spreading of arms, and the arrangement of the cushioning.

We now arrive at the days of Thomas Chippendale, who flourished under George III., being appointed Court cabinet-maker to that monarch. (His workshops, by the way, being located in St. Martin's-lane.) Chippendale was a good man of business, and reflected much of the prevailing taste of the day in his productions. His early work was influenced by contemporary French furniture, while in later life he made attempts at providing for the Chinese partialities of the public, which had been awakened by Sir William Chambers's dissertation on the art of the Celestial Empire.

In his early work Chippendale never went to the lengths which we find in furniture of the reigns of the XIV. and XV. Louis. Le Roi Soleil demanded that sumptuous treatment of all furniture and fittings which should accord with the idea of his over-decorated interiors, and the artificers he employed rose to his requirements. Every species of enrichment was employed: metal mounts, gilding, and inlay and veneer of all descriptions, ivory, tortoiseshell, metal, and wood. The style known by the name of Louis XV. is perhaps still less to be admired, for, added to the errors of the previous period, we lose what lines of constructive propriety there were, and in their place have wildly-flowing curves, panels of of eccentric shape which give the eye no rest or satisfaction. Workmanship was carried to the greatest perfection; we wonder at it to-day, but cannot but lament that so much skill, time, and money was not applied in producing results dictated by a simpler and purer taste. In the lavishness of decoration and the complexity of design the fineness of material is lost, and lines of beauty are unseen. If one has any doubt on this head a visit to Hertford House and a study of the wonderful collection of furniture there cannot fail to speedily convince one of the error of over-elaboration.

This over-luxuriance appears to have been felt even in France, for furniture produced in the later years of Louis XV. and the early ones of Louis XVI. shows greater restraint, gradually preparing the way for the neo-Greek of the Empire.

To return to Chippendale, he reflected, as I have said, the prevailing taste, but exercised a certain amount of discretion in the forms he adopted. His workmanship was good, and a considerable quantity remains, though of course it is scarcely necessary to remark that the vast majority of pieces to which his name is applied never came from his workshop.

The next name we come to is that of Heppelwhite. The productions of this artist are marked by simplicity and good proportion, the lines more severe and the decoration refined, and I cannot help thinking his work some of the most charming of English furniture. A few years later we find Thomas Sheraton following somewhat the same lines, but with perhaps greater freedom. Both of these men pay much attention to the profile of their mouldings, the purity of which seems to image the reviving interest in Greek art.

The style in vogue in France under the Empire influenced English furniture of the early years of last century not a little, but during the later Georgian period and Early Victorian, the deterioration was steady until (I suppose about 1850) the very lowest depth was reached, when neither grace of form, beauty of decoration, nor excellence of workmanship, had any part in the pieces which were turned out. In fact, the name Early Victorian has become a synonym for the inartistic. There seems to have been a feeling that weight and bulk in themselves added to the desirability of furniture, and many of the productions can only be described as "lumpish." It seems in this time also that people became enamoured of overcrowding their rooms with belongings. I know rooms of which I have been told the former contents, and I can scarcely imagine when all the furniture was in of which I am informed, that it would have been possible to anyone to have entered the door, much less lived in the apartment. One characteristic in furniture design of the first half of the nineteenth century I find it hard to account for, and that is, the horror there was of a straight line. Everything was curved and cushiony, and what curves they were! Can it be a faint reminiscence or recrudescence of the horrors of the Louis XV. period? Owing to the great increase of population, there was a large demand for furniture, especially by people of the rising middle class; and this led to the production of cheap pieces, in which the horror of bad workmanship was added to the other evils.

Thank goodness! we can speak of this in the past tense. For we can truthfully say so much; that whatever our present sins of omission or commission may be, we are at least earnestly striving towards the best things to which our light can lead us.

There are some points which strike one in running over briefly the course of furniture design in England:—

1. Each age had a distinctive form of expression. As in the building of houses, so in the fitting and furnishing of them, the designer tried to express the time. There was formerly no such thing as an "Old English dining-room," "Louis XVI. drawing-room," or a "quaint bedroom," as fitted up by a modern firm of great repute, all under an early Victorian roof. No! the house and its contents were in harmony, and both expressed (or tried to express) the actual time and owner. The walls of a room were not decorated with utter disregard of what its use and contents were to be. There was an agreement between the building and the furniture which we often look for now in vain.

2. There rarely appears to have been a desire to ape the fashions of a previous period. Furniture design seems to have been a living art up to the early years of the nineteenth century.

3. Suitability does not seem by any means to have been always the guide. For example, chairs are arranged often with little regard to human beings having to sit in them. The backs so straight, and possibly covered with most uncomfortable knobs of carving, the arms too high, the seats arranged at such a level that you knock your knees when attempting to sit at a table.

4. Workmanship was usually good, a point of the utmost value, for who would spend much time or thought on the design of an ephemeral production? There was great Catholicity in the choice of material. Some were tried doubtless only to be condemned either from lack of comfort or durability, but the designer had an open mind, and used what seemed to promise well. Varied material introduces the element of colour in a natural and durable way, and good colour is as much to be admired as good form. Applied colour has dropped largely into disuse, which I humbly think is a point much to be deplored. It must, however, be admitted that our climate would be trying to applied colour, and that for an article which is much handled, it would prove unserviceable; still, there are cases where, protected from the weather and not liable to be much touched, it could be used. We are, as a nation, afraid of colour, and the instinct for it seems to have been almost dead a few years since from mere inanition. Yet surely under our grey skies we need colour more than most people; not, perhaps, the gorgeously vivid colour of the sunny south, where much is blended into harmony by the brilliant light, but still colour rich and strong; not the pallid and faded hues of the miscalled æsthetic cult. We need colour, but we need first education and training in its use and appreciation.

From the points I have lightly touched on I think we may gather some canons which should guide us for the future.

1. First and above all *the design should be as expressive as possible, expressive of the owner, the place for which it is intended, and its function.*

The chair, or other piece, to be used by a Royal person on a State occasion, should be widely divergent from a similar article for, say, the use of a member of the Architectural Association, though each may be, and ought to be, equally beautiful. Again, as to place, what might be most eloquent in furniture to be used in a city, would appear out of place in a country cottage. Similarly, what is to be admired in one's home may have to be depreciated in one's office.

And then to be expressive of its function! Who cannot recall chairs which are so expressive as to remind one of the very hours of the day? One so eminently having a nine o'clock-on-Monday-morning-air, while others are as decidedly 8.30-or-9-p.m. on a day towards the end of the week!

2. The second guiding principle I would submit must be *suitability in form, material, and decoration.*

The function of the piece is first to be considered, and *that form* which is found by experience or thought to enable it best to fulfil its function, is the form to be commended, and this form will be found to be that of constructive propriety. There is current, (not, of course, among members of the Architectural Association, but among the laiety), what seems to me a mistaken idea, namely, that a design based on frankly utilitarian lines cannot be beautiful, but to become so must have some so-called ornament applied to it. Ornament (and that too must be expressive) can only satisfactorily clothe the form based on suitability. No amount of ornament can redeem from failure the form obviously inappropriate.

To be suitable in material is so obvious that I need scarcely enlarge on it, but only mention the various qualities of materials which must conform to the law of suitability—weight, hardness or the reverse, coldness or otherwise to the touch, durability, and finally value.

This leads us to the third consideration regarding the suitability of design. All decoration must be subservient to the piece's main function. Knobs of carving in chair backs or arms must therefore be anathema; carving of a delicate nature on a much-used article, or costly inlay on furniture intended for a poor man, are equally to be condemned.

Perhaps I cannot better explain my meaning of expressiveness and suitability than by mentioning what seems to me perhaps the most triumphant example of the converse which I have ever seen. I was so unfortunate as to see what I am about to mention a short time back in a shop window. This curiosity, I have reason to think, was intended for sitting in. What met the eye was a huge shell of wicker-work lined with pale pink plush!

No persons anywhere are, as far as I am aware, in the habit of sitting in shells, so it was not expressive of person, place, or function. I cannot believe a shell to be a comfortable or convenient form of seat; hence it is equally unsuccessful when tested by the canon of suitability of form, while I am quite sure that pale pink plush is anything rather than durable.

3. The principle placed last, but not of lesser importance, is *good honest workmanship.* The finest design suffers by inferior production, the worst assumes an appearance superior

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to its merits by being carefully and well made. How much depends in the total result on the choice of the material for the various parts! How much in their accurate fitting together, so that they work easily in their intended ways, such as doors shutting closely but without strain, and drawers running well! It may be urged with truth that labour is expensive, and that for those of us whose purse is shallow exquisitely-made furniture is beyond our reach. To this I would reply, rather simplify the design than accept inferior work. The ill-made piece is a continual distress, not to say aggravation, while the honest and well-made one is a constant delight, however plain and simple it may be.

Thus, then, it seems to me what we should aim at in our furniture of to-day and to-morrow is a design expressive of our day, our personality, and our needs, carried out by sound workmanship in a manner suitable as to form, material, and decoration. This may seem a counsel of perfection, but it is surely always well to have an elevated goal before us, even if our efforts only distantly approximate to our desired end.

There is one more point I would touch on, which is the value of simplicity; better, far better, the unadorned line of constructive grace, than any approach to illogical or florid ornament, which destroys all sense of satisfaction. I would carry this further and plead for simplicity not only in the individual pieces, but in the multiplicity of them. Our rooms are overfull; as we fail to see the beautiful lines of some piece if too overlaid with ornament, so we miss a lovely design if crowded round with a multitude of other objects. And to those who cannot have much, the pleasure and satisfaction derived from a few things of artistic worth must infinitely outweigh that obtained from a plethora of inferior belongings.

And, finally, before I sit down, I would ask, What is our position as architects towards the question of furniture?

There was a time when an architect's work was supposed to end with four walls and a roof; slowly this idea has vanished (or is vanishing), and I rejoice to know that often now the client seeks the advice of his architect as to internal decoration and fittings. I think we may say that it is now clearly recognised that he who designs the house should arrange the setting, namely, the garden. If this is so why should he not equally act as advisor (if not actual designer) of internal furnishing? How often does it not happen that some feature which would produce the effect we built for, is hidden or distorted by the incongruous articles placed before or around it? I do most sincerely believe that many or most of the failures we see in furnishing are due to ignorance, and with the growing art life of our nation this (we hope) will vanish; but granted this is removed, even then no one, it seems to me, can have a better right to speak as to the furnishing of a room or house than he in whose mind the scheme of it has originated and taken shape. I fear I have spoken here in an unduly dogmatic manner, but I feel strongly that in this matter architects may have a great influence in the present and near future in re-awakening a real appreciation and love for things beautiful, and this must be my excuse. Our constant and intimate surroundings, not only in our homes, but even in our offices, exert an enormous, yet often unconscious, influence upon us; that this influence should be towards the right side is of vast importance. To help all we can this growing influence in the right paths is, it seems to me, our contribution as architects towards the question of furniture.

THE SITE OF CHRIST'S HOSPITAL.—The proceedings in arbitration as between the Governors of Christ's Hospital and the Governors of St. Bartholomew's Hospital have been brought to a conclusion. After the hearing of the case at the Surveyors' Institution, Lord Balfour of Burleigh, who acted alone as arbitrator, has just announced his award, which is to the effect that the Governors of Christ's Hospital should be paid a sum of 238,781*l.* as compensation in respect of an area of 67,080 ft. superficial which the Governors of St. Bartholomew's Hospital seek to acquire out of the site in Newgate-street. Taking the site as being, say, five acres in all, it will be seen that the sum awarded is for about three-tenths of the whole area, which the Governors of the school desired, in the first instance, to dispose of in its entirety and under one sale. The Blue Coat boys will assemble on April 19 for the last time in the old buildings.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL meeting of the Royal Institute of British Architects was held on Monday evening at No. 9, Conduit-street, Regent-street, Mr. William Emerson, President, in the chair.

The Late Mr. Bentley and the Royal Gold Medal.

The Chairman said the meeting was a special meeting in order to put to the meeting the name of the Gold Medallist nominated by the Council for this year. He had, however, to announce one of the saddest things which had occurred in the annals of their history. Some time ago their Council nominated for the Gold Medal Mr. John Francis Bentley, the architect of the Roman Catholic Cathedral, Westminster. On Saturday last that gentleman was seized with a paralytic stroke and died on the following day. Had it not been for this great calamity he would have been elected the Gold Medallist for this year. Under the circumstances the Council were placed in a peculiar position. This was the King's gold medal, and they could not say what his Majesty's views would be with reference to awarding a medal to a gentleman who had passed away. The Council had, consequently, decided to let the matter stand over, to ascertain what might be the King's pleasure. They all deplored Mr. Bentley's loss to the profession, just as much as if he had been a member of their Institute. He thought it would be quite fitting that the Institute should send a letter of condolence to the widow. They all knew some of Mr. Bentley's works, and it scarcely seemed necessary to go through a list of them. At the time of his death he was engaged on the cathedral at Westminster, which many of them had been to see, thanks to the kind permission of the architect. Mr. Bentley also built St. Mary's, Cadogan-square, Chelsea, a large Gothic church; a fourteenth century church at Watford (the Holy Rood); he restored St. Botolph's church, Bishopsgate, for the rector, known as "Hang Theology Rogers"; he also did the internal decorations at St. Mark's, North Audley-street; he was the architect of the Priest's Seminary, Hammersmith (which many of them knew as a nice, carefully-designed building); the church of Corpus Christi, Brixton, and a church at Penshurst. His work was well-known to them, and there was no architect of greater refinement or truer appreciation of detail in church architecture.

The Chairman then moved that a letter of condolence be sent to the widow, which was unanimously agreed to.

The special meeting then terminated, and the ordinary meeting then commenced.

Mr. Alex. Graham, hon. secretary, announced the decease of the following Associates, Mr. W. Chastel de Boinville, Mr. G. Cuthbert, and Mr. Thomas Gordon, all of whom were elected in 1882.

Mr. Graham announced the receipt of a number of donations to the library, and on his motion a vote of thanks was accorded to the donors.

Mr. C. H. Gage was then elected as an Associate.

Photographic Records.

Sir Benjamin Stone, M.P., Chairman of the National Photographic Record Society, was then called on by the Chairman to say a few words in reference to a collection of about 100 photographs of architectural work, forming part of the collection of the National Photographic Record Society, which was on view prior to being deposited in the British Museum. Sir Benjamin said it had been suggested by mutual friends of both societies that some of the photographs should be shown in that room before they were sent to the British Museum. It would be admitted that they, as architects, were associated with so many beautiful and historical objects in connexion with their work that they must know and feel that any encouragement in the direction of the preservation of records of those objects was commendable. It was a common idea that because most people had kodaks and cameras there was a great deal of good and useful work being done which would prove most valuable in future time. There was no greater mistake than that. Most people who took the trouble to do good work did not keep a register or list of it, and later on, when death removed them, no one knew what they had collected. That was often the case; but then there were the "wasteful photographers," who were on every hand, who photographed things they knew not why, and what they did was often a waste of time and money. Out of the mass of those who photographed things it seemed possible to make sensible people take some interest in historical records, and his work had rather been with the intention of setting an example—not that he presumed to do anything on a large scale, but in order to help get the work done. With his friends, Mr. Scamell and Mr. Alex. Graham, they had succeeded in impressing the public in different parts of the country as to the importance of the work. A number of collections had been made of great interest and value; in all, in about twenty places in the country, good collections had been formed, and these would be preserved in the county towns. That was the kind of work which ought to be done everywhere, for things were so transient, and people, when objects or customs of interest had passed away, gave large sums of money for reliable records of past times. Our own history was built up of things which were absolutely lost to us, and we knew how valuable even an ordinary drawing or sketch was of the past; it was prized for what it showed, say, of the habits of the people, the character of the buildings, the customs of the times, &c. They would appreciate the possibilities of making such collections, for he knew he was talking to kindred spirits, and if they helped in forming such collections they would be doing good work, not only for themselves but for those who came later on.

Mr. Alex. Graham, Hon. Treasurer of the National Photographic Record Association, said he had great pleasure in proposing a vote of thanks to Sir Benjamin Stone for coming among them that evening. He did not stand before them as a treasurer appealing for money, for the requirements of the Society were very few, and they got on with very little, but as an enthusiast of the Society and an admirer of Sir Benjamin Stone's work—work for a very good object. Any one who looked round that room and saw the photographs would realise that this Association was working on right lines. The photographs they saw that evening were architectural records, but photographic records were made of all sorts of things, which were sent to the British Museum—records of old customs in different villages, processions, &c., which the average public knew very little about, and which in the course of time would become obsolete. As these photographs became records, and showed the life of the people in our time, the public generally were really much indebted to the Society for the work it was doing. Their Hon. Secretary was Mr. Scamell, and he hoped that gentleman would be present at the meeting of the Architectural Association the following Friday to explain the objects of the Society and the methods adopted to make the records permanently valuable, in view of so many of the younger members of the profession being photographers

The Chairman said he had much pleasure in seconding the vote of thanks, which he was sure would be carried with acclamation.

Mr. E. W. Hudson, in supporting the vote of thanks, said he should like to know how long the photographs in that room would be on view. They all represented objects in Great Britain, but Sir Benjamin Stone was known to have taken valuable photographs in other parts. If he was not mistaken, Sir Benjamin had taken many views in Malta which were of great interest. He (the speaker) was in the Library of the Order of St. John, at Clerkenwell, recently, and he there saw some photographs showing Phœnecian ruins in the island which were archæologically most important and likely to throw light upon "Druidical" remains in Britain and elsewhere. He would much like to come across a full description of them. He hoped the authorities at Malta were watchful of such antiquities.

Mr. W. J. Locke said that the photographs would be on view until Saturday morning.

Sir Benjamin Stone said Mr. Hudson's remarks opened up a train of thought which might very well lead to a long address. Incidentally, he might mention he had taken photographs in most parts of the world. The particular photographs Mr. Hudson had referred to must have considerable interest to members of the Institute. Some twenty-four years ago there was unearthed at Malta

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that great temple which was known as the Malta Temple, and which was of extraordinary interest. It was found undisturbed, and the figures of the "gods" were all in position. The matter attracted him so much that he went to Malta and photographed the temple, and he also photographed our Stonehenge to the same scale to see the resemblance between the two. Without being dogmatic, and without saying what Stonehenge meant, he was pretty certain that the date of Stonehenge might be approximately fixed at the time of the megalithic building in Malta. Moreover, he was strongly of opinion that the Malta Temple would give a clue to what Stonehenge had been in the past. The photographs afforded a most interesting comparison between the two. Sir Norman Lockyer, they knew, had arrived at a certain date for the age of Stonehenge. He (the speaker) had arrived at the same period, within a few hundred years, by a totally different process of deduction. The great colonists of Tyre had fixed on Malta as a colony, and had introduced their megalithic buildings there at a date which was known, and if they compared Stonehenge with the Malta Temple the result seemed to give an absolute clue to the date and history of Stonehenge.

Smoke Abatement.

The Chairman, having thanked Sir Benjamin Stone for his remarks, then called on Sir William Richmond, K.C.B., R.A., to address the meeting on the subject of smoke abatement.

Sir William Richmond said that before he dealt with the subject which was down for discussion, he should like to offer his sincere thanks to the Institute council for the very generous subscription they had made towards the excavations in Crete. As Hon. Treasurer of the Cretan Exploration Fund he could thank them, though he did it on his own responsibility, for their generous advance towards the promotion of one of the most historically interesting works in our time, and he hoped the action of the Institute would be an impetus to other societies. As to the question of smoke abatement, he thought it excellent brotherhood that the Institute had acceded to his request, and that they should enter, not only with sympathy, but, he hoped, with activity, into a cause which must appeal to them as artists on account of the love they bore towards their predecessors' work in that noble and ancient art of architecture, and on account of their own work. If there were means by which the dismal smoke of London might be dispelled, or even modified, then they, as architects, by reason of their far-reaching influence as constructors, were the men best fitted to promote the acquisition of cleaner cities. Professor Church would tell them of the irreparable damage caused by the deposit of the acids contained in this soot, and they would have heard from Sir W. Thiselton Dyer, had he been able to be present, of the damage being done to the national gardens at Kew by the smoke from factories in the vicinity. That gentleman would have told them of his fruitless though earnest appeal to the First Commissioner of Works to execute his prerogative and force the manufacturers of Brentford, who were on the Parish Council, to prosecute one another. Some ten years ago there was a smoke fog which lasted for five weeks, and he happened to be speaking to Sir W. T. Dyer shortly after that on the subject of the effect of the smoke fog at Kew, and that gentleman told him that he had had the residuum of that fog weighed. It was scraped off the glass in the gardens at Kew (the area of glass was about one mile), for it could not be washed off, and according to Sir W. T. Dyer, the residuum weighed six tons. Certainly one quarter of Kew Gardens was being irreparably damaged by the smoke from Brentford, and members of the Coal Smoke Abatement Society were going to tackle the matter there. They had made representations to the First Commissioner of Works without avail, though he might add there was a rift in the clouds, for he had received a letter which showed that the First Commissioner might possibly use his weight, and do his duty. In the east end of London, in that part extending from London Bridge to the Nore, there were—along both sides of the river, and far back—on either side, thousands of factory chimneys which belched forth black smoke day and night, their owners defying every clause of the Act of 1891, by which such matters could be restrained by the local authorities. The Coal Smoke Abatement Society had used every endeavour to get local authorities to enforce the clauses in the Act, thinking it was better to make use of an Act already in existence than to try and make a new law for themselves. They had succeeded in a great many cases; in fact, in the majority of cases. They had succeeded, with one inspector and an assistant, in getting a larger number of fines on account of the infringement of the law than the County Council and all the Borough Councils put together. Now public opinion was being roused, and people were at last beginning to say: "Let us be rid of this nuisance." Parish Councils and Borough Councils and the London County Council were, in some respects, go-ahead bodies, and in other and important respects, sleepy bodies. These bodies, however, and the Local Government Board, which was pretty well always asleep, were beginning to whisper—"only whisper, mind"—among themselves: "It wont do for us to wink at the law any longer." It was not so much in the matter of public factories that the Institute could help the cause, although by giving the Coal Smoke Abatement Society moral support they would and could help, for the community at large would doubtless think more of a society that enrolled within its ranks a body of men such as the members of their profession, who were carrying on an art which in itself was essentially beautiful, but in the highest sense essentially necessary; and by the enlistment of architects in the army of crusaders, the Society would gain great moral vantage. But they could render the cause another service by promoting the idea among their clients that there was not the slightest reason why those most desirable open fires—the winter suns of England, he always called them—should darken their homes and render the outside air ugly and destructive. He thought he was right in saying that the habit was becoming more general for people to live in flats, and that practice would probably extend as land became more valuable in large towns. It was no use to imagine that open fires would ever be got rid of. In public buildings, should not architects in the design of them make some provision for warming them otherwise than by the wasteful method almost universally in vogue? It was hardly to be expected that people would be persuaded to burn nothing but anthracite coal, the use of which would be one means of getting rid of the nuisance almost entirely. What had to be provided was a smokeless grate, and when they had that architects should feel themselves bound to get their clients to use it. In blocks of buildings for the use of the poorer portion of the community, heat might surely be obtained from one great generating station, and the poor should be encouraged to cook by gas fires. Of course, the individualism of the poor was very remarkable, and there was something fine in their independence, but it was to be questioned whether such individualism was for their ultimate happiness; it engendered want and improvidence. How much better and more cheaply could they live if they would be content to act and partake in common! and although architects had no more power than any one else to dictate to the poor how they were to live, they had the power of recommending to such bodies as County Councils, Parish Councils, and others, to construct workmen's dwellings so that heat could be admitted throughout a large area, just as gas and water were. Why should there not be a heat rate as well as a gas and water rate? Of course, these were only suggestions, and possibly others had thought the same, and he was sure they were all as earnest as he was to protect works of art from destruction and to promote the cause of health and light, and consequently happiness, and to do individually, as well as collectively, what lay within their power to make the city they all loved more beautiful and desirable as a place of habitation for poor as well as rich. He hoped they would not separate that night without coming together as brothers in a great cause, which had at its root not only the æsthetic but the ethical influence which light, order, cleanliness, and beauty go to promote. In conclusion, he would move the following resolution, *i.e.*, "In view of a resolution of the Coal Smoke Abatement Society seeking the co-operation of the Royal Institute of British Architects, members are invited to join the Society, or that such other assistance be given by the Institute as the Council may deem desirable.

Mr. John Slater seconded the resolution. He said it must have been evident to every architect who had anything to do with London that the difficulty they met with was not so much the factory chimneys, which were under control, but the ordinary house-grates of the large and small buildings of the city. Of course, to a large extent, the difficulty was one of expense. If they were building a very large block of flats, it might be quite easy to adopt one general system of heating which would result in a very small amount of smoke, but with a large number of individual buildings which were put up, unless there was some power to control the speculative builder to force him to do his best to diminish the smoke curse which assailed London, he was sure very little could be done. He felt sure that most members of the Institute would join the Society, as he intended to do, and do all they could to help it and make it successful.

Professor Church said he had been asked to say a few words on the chemical aspect of the question. They probably all knew the chemistry of fog, of smoke, and of London atmosphere; but he would make one or two observations as to the chief constituents of that fog and of London atmosphere. In the products of imperfect combustion of coal, coke, gas, and anthracite we had not only soot, but tarry matters, sulphurous acid (which rapidly passed into sulphuric acid), and we found, also, a considerable quantity of ammonia, and what chemists called compound-ammonia. These products were partitioned in different ways. If it were not for the solid particles of carbon, the soot, the imperfect burning of coal would do little harm; but it was these solid particles which gathered to themselves the acids—the ammonia compounds—and these became deposited upon our buildings, plants, glass, &c. It was these solid compounds, latent in the imperfect combustion of coal, which did so much harm. Not only did these compounds blacken the atmosphere, soil, buildings, &c., but they brought these active chemical ingredients into close contact with the stone of buildings. Rain, it might be said, did that, but we did not have rain always with us, whereas smoke almost always was. Rain, moreover, "scrubbed" the atmosphere, as the manufacturers of gas said, and it took up the sulphuric acid and other agents and carried them to a great extent straight down on to the flat surface of the pavement, or road, or skylight, and did not to any appreciable extent act on the vertical surface of buildings; but soot lodged everywhere, laden with impurities, and attacked those surfaces. He had recently shown the extraordinary character of the incrustation on the plinth above the cornice of the dome of St. Paul's, which in some places was 3 in. in depth, and which contained only 1 per cent. of carbon, but ½ per cent. of tarry matter, and ¼ per cent. of ammonia compounds, which were so peculiarly deleterious to vegetation, and which did so much damage at Kew and in the neighbourhood of London. A great improvement had taken place in smoke-consuming grates for domestic use, but a good deal remained to be done in that direction. The mechanical washing of coal at the collieries helped to get rid of a lot of the sulphur, but no amount of washing would get rid of all, so that we should always have sulphuric acid produced, however perfect the grate might be, or the combustion of coal. For twenty-three years he had used in his house nothing but anthracite in fire-brick grates. He had found it no more expensive than the ordinary bituminous house coal, and there was no difficulty in lighting the fires, which was done either by means of jets of gas, or by the use of wood with a very small quantity of this enemy of art, bituminous coal. But he was bound to confess that it was impracticable to think that they would be able to get used nothing but anthracite, and in view of that, improvements in smoke-consuming grates were greatly to be desired.

Dr. des Vœux said he thought the matter interested architects more than any other body of men in London. He had taken some little trouble and interest in the matter of the abatement of smoke in private houses. In his investigation he was assisted by Mr. Bryan Donkin, a member of the Smoke Abatement Society; they began with the fact that the Englishman would keep to his open fire and the use of ordinary coal. He had tried to get friends of his to use anthracite or gas, but they

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had reasons of some kind or other for not doing so—either that they could not get it, or it was too expensive; or, in the case of gas, that it burned away too much, or smelt, or dried the air. For these reasons they started with the proposition: "Can smoke be diminished from an open grate burning ordinary coal?" To test that, they had to go into the matter rather deeply. In the first place they had to get a chimney—and a chimney that they could pull about, take out the grate that was in it, and put other grates in. Then they had to get a room facing the top of that chimney so that they could measure the amount of smoke coming from that chimney. Through the kindness of Lord Esher, they had put at their disposal two rooms in H.M. office in Westminster, which were exactly what they wanted. In one room they found a fireplace very similar to the one in that meeting-room, which they took as a standard. It burnt a very large amount of coal and emitted a very large amount of smoke. That grate was tested for three days of eight hours and the result of the test showed that it was a wasteful and smoky grate, though its heat was fairly good. The results of their experiments were about to be published. In order to get further into the matter they advertised in two daily papers for so-called smoke-consuming grates, and as a result five grates were brought to their notice. Four of them certainly did diminish the smoke to a great extent, and one of them was very nearly perfection. It gave a great amount of heat—from 15 to 20 per cent., he thought, greater than any other grates—and it burnt 20 to 25 per cent. less coal than the next best to it of any sort or kind. Compared with the grate in that meeting-room, it burnt 50 per cent. less coal and gave 35 per cent. less smoke, and it gave much greater heat (50 per cent.). As to the tests, temperatures were taken in various parts of the room every half hour for eight hours. The amount of coal put on the fire was weighed, the number of times the fire was stoked was recorded, the amount of coal put on each time, the amount of unburnt coal left at the end of the eight hours, and the amount of ashes—and every fact of importance, in fact, was recorded. He thought these investigations (the first which had been carried out in a systematic way, as far as he knew) were extremely encouraging. As the results of the tests, what was wanted was some central board which would take up the matter and test domestic grates and show that a grate of a certain satisfactory standard could be obtained, and that in future no grate which emitted more smoke than that standard grate must be put in a private house. That only touched the question of smoke from sitting-rooms. They had not gone into the question of smoke from the kitchen grate, but in his own house he had got over the difficulty entirely. He had been in his present house four and a half years, and he had not had the kitchen chimney swept yet, and he got over the necessity by using gas for cooking. It was a very practical way, and he knew exactly what it cost him, which was a very important question. Clients might tell them that that was an expensive method to introduce into the house, and that food, when cooked by gas, tasted of the gas. He had had great difficulty in finding out how he could best get hot water, and he found it was best done by putting in a coke boiler, and in that way he not only got hot water, but he had been able to get steam heating for the house. At any time of the day or night he could get hot water of a temperature of 170 deg. The heating by a coke boiler cost him about 1s. 6d. a week—at the outside 2s. in the winter. He found he had so much hot water from his coke boiler that he had to put in three radiators, so, in addition to baths and washing apparatus, he was able to heat the passage in the house. Those facts proved that a great deal could be done if there was combined effort to do it. There must be some central board or authority to show that this could be done, and if it had to be shown the Royal Institute of British Architects was the sort of society in London to do it.

Mr. W. D. Caröe said that as a member of both Societies interested he should like to thank Sir Wm. Richmond for having brought the matter forward. It was interesting to hear that there was a very promising grate in existence, but they had not been told the price, which was an important matter. But he was afraid that that was not all. If they had the Central Board as suggested—which suggestion he entirely approved—how was it going to require that such a form of grate was to be put in all the houses which now exist? After all, the largest amount of smoke came from the small houses, such as were to be found in the east end of London. Well, Sir Charles Cookson, an energetic member of the Coal Smoke Abatement Society, had made a discovery which might be applied generally, if only the gas companies would help. Those companies had already shown what great profits they derived from the poorer classes by the penny-in-the-slot system, and it was a question which affected the poorer classes particularly, for rich people might be got to adopt special grates. Sir Charles Cookson's idea for getting the poorer classes to use the existing grates so that they should not create smoke was an exceedingly simple one. All that was required was a small gas jet, a little circular pipe put immediately under the bottom of the grate, with a few holes in it, and in the bottom of the grate was inserted a small marketable article called a "crater." Sir Charles Cookson said that was not absolutely necessary; but in any case it only cost 1s. 6d. Gas was only used for lighting the fire (of coke), and it was turned on for about five minutes or so, according to the draught and the result was a very comfortable fire. If the fire went down the gas had simply to be turned on again, and in two or three minutes the fire was quite bright. Moreover, in dealing with coke, very little stoking was necessary. Sir Charles Cookson had fitted up the whole of his house in this way, and has had a year's experience of the working of the arrangement, which had proved perfectly satisfactory, and it was exceedingly cheap. It seemed to him that what they had to do was to persuade the gas companies to put in the installations under the fires free of cost, just as some of the electric light companies in poor districts put in wiring, and if they did they would make an enormous profit themselves out of the carelessness of the users, and do much to solve the smoke nuisance. He had tested the method himself and had found it quite successful. Some time ago he had to deal with a house in which there was an old flue which very soon got fouled. He added to the grate the arrangement he had been speaking about, and the chimney had not required sweeping since.

The Chairman: I presume that in the flue you were speaking of they had been using all coal, and afterwards they used coke. So that the whole question is determined by people using coke instead of coal.

Mr. Caröe: Yes.

Dr. Wyld said that simultaneously with Sir Charles Cookson he began to use gas for the lighting of his drawing-room fire, and he found it perfectly successful, and more economical than wood even. It had this advantage: if one left the drawing-room for some time, and came back when the fire was almost out, except a small spark, by merely turning on the gas it blazed up, and one had a good fire in a couple of minutes. It was a most admirable plan. In reference to the gas companies supplying the apparatus free of cost, the Gas Light and Coke Co. had good reason to be thankful to him, but he could not get them to provide the necessary arrangements for lighting fires by gas, though why they would not he could not tell, for if they were to do so it would mean a gain to them of 300,000*l.* a year from extra gas used. As to the new grate referred to, the fundamental principle of it was a blower in a certain portion of the grate—in the bottom, instead of at the top. What he would strongly impress upon architects was that they should consent to build no house unless the grates had blowers, for the provision of blowers was most desirable in the lighting of fires, and nearly all the smoke in London was due to the smoke caused in lighting fires, and if blowers were provided that would be done away with. In his drawing-room there was a blower and the smoke had disappeared. The cost of a blower was about half-a-crown, and all that was necessary to fix them where they did not exist was to drill a hole in the ironwork, put in a peg, and hang on a sheet of iron. Architects designed beautiful grates, but why did they not provide them with blowers equally beautiful?

Mr. E. W. Hudson said he was afraid his experience would not endorse the last speaker's remarks about blowers. Blowers were good for drawing the smoke up the chimney, but they did not obviate the smoke. He had used them, but he had never found them prevent the smoke; the smoke passed up the flue, but it was there. It was quite true that the lighting of the fires in the morning was the cause of the smoke in large towns. He had an idea that in a new house at Eastbourne the flues were arranged horizontally in one shaft, and the smoke was consumed before it passed into the open air. He thought something of that kind might be done.

Mr. Julian Corbett said he thought that it had been shown that it was possible to combat smoke from the open grate, and he thought that the cause would receive great help from the Institute if the Institute would appoint a committee to consider the subject. The Coal Smoke Abatement Society had considered the subject from their point of view, and it seemed to him that it should be considered technically, and from the architect's point of view. Unless the views of architects could be met, they were simply beating the air, and it would be a great help if the Institute could see its way to carry on the experiments.

Mr. C. H. Brodie asked Dr. de Vœux if either of the grates he had experimented with was what was known as the "well fire"—a fire which was very common in the north of England. It was used, but not largely, in London at the present time. There were several makers of them.

Dr. De Vœux replied that he had tested one of them.

Mr. Brodie: Was the result satisfactory?

Dr. De Vœux: Fairly; much better than *that*—referring to the grate in the Institute meeting room.

The Chairman said he was sorry such hard things had been said about the grate in that room. It gave out a good deal of heat, whatever amount of smoke it produced. They had heard of an excellent grate, and some of them would like to know the name of the maker. He thought it was a pity that architects did not turn their attention more to the subject of smoke-consuming grates, but there would not be much encouragement if after designing a grate the client would not adopt it on account of the cost. That would mean that the design would practically become a present to the grate manufacturer, seeing that architects did not take any profit from building materials. It would also be very difficult to force the smoke-absorbing grate on to builders, for that was, he supposed, what they wanted a central committee to do. It would be a very difficult matter to get people who build houses to use these grates, or to adapt those which they had. If there was a simple means of adapting a grate burning ordinary coal to consume smoke, and the Society would show how it could be done, the Institute might be able to do something; as it was the Institute was quite willing to do what it could to assist in the furtherance of the objects the Society had in view, and he had great pleasure in putting the resolution to the meeting. Attention should be called to the resolution in their "Journal," and the Council would give the matter consideration at an early date, and see if they could arrange for a committee to look into the matter and see how they could co-operate with the Smoke Abatement Society.

The resolution having been put to the meeting and carried, a vote of thanks to Sir William Richmond was, on the motion of the Chairman, heartily agreed to.

The Chairman said that the next meeting of the Institute would be held on the 17th inst., when Mr. S. K. Greenslade would read a paper on "Planning of some Recent Library Buildings in the United States."

The meeting then terminated.

COMPETITIONS.

POLICE BUILDINGS AT SMETHWICK.—The Watch Committee of the Smethwick Corporation have had before them several sets of competitive plans for the new police buildings which are to be erected in Halford-street. They have, it is understood, decided to recommend the Town Council to accept those submitted by Messrs. Bailey & McConnel, of Walsall, and the work is to be proceeded with as soon as the necessary arrangements can be made. The estimated cost of the buildings is about 12,000*l.* or 13,000*l.*—*Birmingham Post.*

THE LAND TRANSFER ACT, 1897.—An order in Council has been prepared for submission to his Majesty in Council, whereby the date of the operation of the Act, in so far as it relates to the City of London, will be postponed from March 1 to July 1, of the current year.

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CARPENTERS' HALL LECTURES.

On Thursday, the 27th ult., Mr. H. H. Statham gave a lecture at Carpenters' Hall on "The Architectural Treatment of Bridges," Mr. Aston Webb, A.R.A., in the chair. He characterised the subject as being essentially a modern one, as until recently bridges had been regarded as purely utilitarian structures; even the mediæval bridges which we have regarded as picturesque were, to the men who built them, only the best practical method of building according to their knowledge and requirements. Recently there had arisen a perception that a large bridge in a city might be an important addition to the architectural character of the city. A solidly built arched stone bridge was in itself a structure naturally beautiful; it was only when we began to "ornament" it that we might run the risk of spoiling it. The old-fashioned bridges with narrow spans and semicircular arches were the most picturesque; but the demand for larger spans as our traffic grew more crowded and river craft increased in size, rendered it no longer possible to build bridges in this form; and led not only to wider arches but to the introduction of steel spans, either with stone or steel piers. Steel bridges were a practical improvement in facilitating the combination of wide spans with low gradients; but owing to their thin lines, they could never have the grand and monumental effect of a stone bridge, and they had the additional disadvantage of requiring constant painting, with all which they could not have as long a life as a granite arch. Then there were railway bridges, which were a separate problem, having to be constructed to fulfil special conditions in carrying heavy loads moving at great speed; so that structures which were satisfactory for ordinary roadways would not suffice for railways.

Bridges might be classed under three heads; (1) stone arched bridges; (2) steel spans with stone piers; (3) steel spans with steel piers. We might add a fourth class, now supposed to be rather *passé*, viz.: wooden bridges. These, like the stone arched bridge, were almost invariably picturesque from the very nature of their construction, as was shown in the instance of one of the timber viaducts originally built on the Great Western Railway; but for railways they had not the quality of stability and permanence, besides offering danger from fire, and it could not be supposed that any such viaducts would in future be erected on English railway lines. But for small bridges in country places timber was still a suitable material; such bridges also harmonised with the landscape; and it was much to be regretted that some of these picturesque and perfectly adequate wooden bridges on the upper Thames were being removed and replaced by iron ones, which might or might not have a longer life, but which were certainly not such agreeable or suitable objects in a rural landscape. Steel bridges on a large scale might be classified under the heads of beam bridges (or what engineers would call "girder bridges"), suspension bridges, and trussed bridges. He used the term "beam bridges," because such bridges were merely the application of the beam system of bridging an opening; laying a rigid beam across which bore vertically on the two points of support. A lattice girder was, no doubt, a trussed construction within its bounding lines, but regarded as a whole it was a beam; it acted as a beam; and it was or ought to be no more offensive to taste than a wooden beam performing a similar office. The Britannia tube bridge, in another form, was a typical beam bridge; and with its massive and simply treated towers was a fine object. Suspension bridges, like stone arched bridges, had the advantage of being almost necessarily beautiful in themselves, if let well alone. There was always beauty where a structure expressed, as it were, the forces of nature, whether in the balanced curve of the arch or the catenary curve of the suspension chain. The practical drawback to suspension bridges, for heavy traffic, was of course their lack of rigidity. Of what might be called trussed bridges the most important form nowadays was the cantilever bridge, of which the Forth Bridge was the most remarkable example, and by means of which greater widths had been bridged than had ever been attempted before. (The principle of the cantilever bridge, with its two arms and the straight length between, was illustrated by the photograph of two men seated in chairs and supporting a third man in the air between them, a whimsical but apt illustration originally made under Sir Benjamin Baker's direction). The cantilever principle, though only recently used on a large scale by engineers, seemed however to be a method that had recommended itself to uncivilised man, as was shown by photographs of a rude Chinese bridge and another made by North American Indians, both of which were cantilever bridges in a crude form.

Of all these classes of steel bridges it might be said generally that the less attempt at ornament on them the better. It was very difficult to put any ornament on a steel bridge which would not have a more or less gewgaw effect: the undisguised structure was far better and more sensible. *Pure structure was never in bad taste;* and the anathemas often made against every kind of engineers' steel bridge by æsthetic persons were very absurd. If the objectors knew a little more about structure they would find the steel structure in itself interesting, instead of regarding it as an abomination. Unfortunately the engineers were going rather in the wrong direction; they were spoiling this class of bridge by attempted ornament. Taking suspension bridges for instance, it would be seen from the illustrations how extremely simple were the Menai bridge, the old Hungerford bridge (now at Clifton), and the old Hammersmith bridge; while in the new Hammersmith bridge they had gigantic cast-iron foliage ornament of the most hideous kind, and such as would be enough to vulgarise any structure. Contrast with such a work the Auteuil bridge at Paris, with its plain structure in the spandrels, a little graceful ornamental treatment in the balustrade (where it was quite in place), and the fine stone sculptured figures on the piers, modelled by some of the first French sculptors of the day. Was not the contrast rather a humiliating one for London?

The Tower bridge was referred to as one which was a combination of suspension bridge, beam bridge, and lifting bridge. It was an unfortunate mistake to suppose that because it was near the Tower it was to be mediævalised. The way to harmonise with mediæval structures was to do as the mediæval builders did—build in the best way known and practised at the time. A steel structure honestly shown would have been far more in harmony with the Tower, in the true sense, than a piece of sham mediævalism. The first design for the Tower bridge however, by the late Sir Horace Jones (a view of which was shown) was much better than the one actually built, as it was simpler and more massive in effect, and the towers were genuine solid stone structures. Even in this design, however, there was a want of simplicity, the towers being weakened in effect by unnecessary decorative windows and other details. In the actual bridge these defects were much increased, but the greatest mistake of all was that these apparently massive towers were a complete sham, with no foundation at all, the walls being carried on steel girders; and before the bridge was completed for opening he (the lecturer) had looked under the walls of the towers, which stood over empty space. It was perhaps the most glaring instance of sham in building that had ever been seen. A sketch was shown on the screen to illustrate how such a bridge might be built so as to be a solid and genuine structure, the horizontal girders carrying the tie which connected the suspension chains being laid on the top of massive towers of stone brought out on each side as buttresses, and the ends of the horizontal members, resting on roller-beds, brought out to the front of the buttresses, so that it could really be *seen* what the suspension chains were attached to, instead of leading them through openings in the masonry as if they rested on it. The mechanism for raising the bascule leaves of the bridge, of which a section was shown, was a beautiful and simple contrivance which could not be too much praised; as an engineering structure the bridge was a splendid success; as an architectural design it was a flagrant piece of pretence. Even in regard to plain steel construction, there was such a thing as good and bad design. Contrast the elevation of the Sukkur bridge, in which there seemed to be no ruling element of line or disposition, as if the girders were tumbled together, with that of the Forth bridge, which by comparison was a quite classical design in its symmetry and unity of effect. Coming to stone bridges, they had to consider several points—the form of the arch, the treatment of the spandrel; the treatment of the piers. Semicircular arches were out of the question in these days of wide spans; they had to choose between the elliptical and the segmental form. The former looked best, as it rose tangentially from the pier surface while the segmental arch was butted against it; and the elliptical arch gave more height close to the pier; on the other hand it was flatter at the crown than a segmental arch of the same span, and for a large span required therefore very careful building. The voussoirs might either be treated on the same plane with the masonry of the haunches, as in London Bridge (which had a very fine solid effect), or they might be accentuated so as to leave a defined spandrel. Such a spandrel, however, should never be panelled, as at Grosvenor Bridge, Chester; that was a treatment for carpentry, not for masonry. The treatment of the soffit with groins, as in many mediæval bridges, was very effective for bridges on a moderate scale; but for bridges on a large scale there was perhaps nothing so fine as the sweep of the plain unbroken soffit. The projection of the piers, although there had been a kind of traditional notion since Renaissance times of decorating it with a columnar order, ought rather to be treated as a buttress. The raking lines of the balustrade and cornice should be stopped against the pier, not carried round it; the pier was a vertical abutment to them, and not any part of them. The old mediæval treatment of the buttresses as pointed to divide the current produced in itself a picturesque effect founded on practical requirements; but except in a tidal river this treatment should only be strongly accentuated on the up-stream face of the bridge. Character was given by thus suiting the build of the bridge to the run of the water, as was shown in the grand effect of the St. Lawrence Bridge, with its immense up-stream buttresses to break up the floating ice. Waterloo Bridge was an exceptional example in which the classic cornice was excusably used, because the whole bridge was entirely level from end to end. In London Bridge, where there was a gradient, Rennie, with true instinct, discarded the cornice and only used a small corbel table. The new Putney Bridge was a very good example, in the same school, of a granite bridge simply and plainly treated, with no adventitious ornament. Reference was then made to Blackfriars Bridge, and to the unfortunate design of the piers as stumpy granite columns of immense thickness, which could have carried a tower over them, and had nothing to carry but a balcony. These columns, like Alexander the Coppersmith, had "wrought us much evil," for engineers seemed to be so much enamoured of the effect that the first design for the new Vauxhall bridge was almost an exact imitation of Blackfriars bridge. The Institute of Architects had begged for a granite bridge instead of a steel one of this design; it was replied that the demands of the various authorities in regard to width of span and gradient rendered a granite arch impossible. Eventually a compromise had been come to by adopting a concrete arch with granite facings. The concrete arch itself was an admirable piece of construction on a somewhat novel principle; a section of it was shown and described; but in the so-called architectural treatment the influence of the Blackfriars stump column still prevailed, and the pier was treated with an enormous half round column which had nothing to carry but a lamp-standard, and this again had to be made far larger than necessary in order to appear to provide something for the column to carry. The whole thing was so completely out of scale that though the actual height was about 70 ft. from the water line to the top of the lamp-column, any architect would suppose from the scale of the drawing that it represented a structure about 30 ft. high. Then a heavy cornice of supposed classic style was used below the parapet and carried round the column on a raking line; an arrangement which could not be carried out except by "fudging" the mouldings at their mitre junctions; and another effect of this deep cornice was to leave so little depth for the centre voussoir as to make the centre part of the arch hopelessly weak in appearance. A design by the lecturer was shown (illustrated in the *Builder* of October 5, 1901) in which, on the same constructional lines, the pier was treated in a buttress form; and by substituting for the heavy cornice a simple corbel-table (as in

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London Bridge) a greater apparent depth was given to the central voussoirs, while the whole of the voussoirs were treated in a slightly decorative manner, by fluting each alternate one, so as to suggest the idea of their being what they actually were—a facing or revêtement, not an essential element in construction. Another design was shown for a different treatment of a pier, with the flat central buttress member turned round at right angles to the line of the bridge, and carrying the lamps also at right angles to the bridge.* This had a very bold effect, and there was something to be said for it in a practical sense.† When he had exhibited this design in connexion with a paper read a little while since before the Birmingham Architectural Association, one of his audience remarked that it was "Gothic feeling with Classic detail"; and that in fact was exactly what he was driving at, and suggested the moral with which he would conclude, viz, that if anything satisfactory was to be done in the architectural treatment of bridges, it would not be by plastering on to them architectural details meant for quite different situations, but by returning to the mediæval principle of so designing the lines of the masonry as to make them in themselves expressive and characteristic.

Mr. Aston Webb said he must ask them to pass a hearty vote of thanks to Mr. Statham for his lecture. He did not think there were many ladies or gentlemen in that room who would be likely to build a bridge—he felt sure he would not—and though ladies were becoming architects he did not think they would be asked just yet to put up bridges; but though it was unlikely they would be called upon to build a bridge, it was important that they should have some notion of how one should be built. It was also desirable that where there was a fine bridge—as there was in London and in many of our towns and country places—we should know how to value it and keep it. Mr. Statham had not only criticised the design of bridges which had been erected or were about to be erected, but he had shown them what, in his view—a view with which most of them would agree—were the lines on which bridges should be put up. There was hardly anything more poetical or romantic, he thought, than a bridge. The connecting of two banks by solid material and the passing of traffic over it, or the cross traffic underneath on the water-way or roadway at right angles to the traffic over, always formed a subject of interest, and must impress even the most unreflective. He thought they would all agree with Mr. Statham that the interest which was connected with bridges was best obtained and preserved by the simple proportions of the bridge itself. We did not want to be distracted by little bits of ornament and misplaced construction, which was really not construction at all. It was not for him to go into a criticism of bridges which had been built or were about to be built, but as to London Bridge he endorsed Mr. Statham's remarks in regard to the necessity or not for widening that bridge. It might be a necessity, but whenever he had had occasion to cross the bridge his traffic had never been interfered with, and since the Tower Bridge had been erected he had been able to get across London Bridge with the greatest ease. But if the bridge must be widened—and he supposed they must accept the opinion of those in authority as to that—they were entitled to know what was going to be done, so that they might be in a position to know whether what was going to be done was the best thing to be done; and for this reason he thought the lecture had been of considerable use. One great difficulty in a stone bridge was that the arch from its nature was never at rest; it was always pressing out and, to some extent, upwards. Stability was obtained in a building with an arch by weighting it at the top, but that was a thing which, in large span bridges, which now of necessity were constructed across great rivers like the Thames, was almost an impossibility, and a very narrow depth of masonry over the top of the arch must always give, to some extent, an idea of weakness, for there was nothing but a thin line of roadway for the arch to carry. He thought Mr. Statham was right in omitting the cornice in his design for Vauxhall Bridge and deepening the arch as much as possible. Much as we admired London Bridge and Waterloo Bridge, one had to give way—and we gladly gave way—to the French as the great bridge designers of the day. The new bridge for the Paris Exhibition was acknowledged by all artists and all who were interested in such matters to be a magnificent bridge. We must hope that Vauxhall Bridge would be able in some way to vie with that bridge, but it was not for him to say whether it would or not.

The vote of thanks having been seconded, was cordially agreed to, and, Mr. Statham having briefly acknowledged it, the meeting terminated.

The lecture was illustrated by more than sixty lantern slides of bridges of various kinds, arranged so as to successively illustrate the various points touched on in the course of the lecture.

* This design is illustrated in the present issue of the *Builder*.

† See further description under the head of "Illustrations."

SOCIETY OF ARTS.

ON Tuesday evening Mr. Gerald Horsley read a paper at the Society of Arts on the subject of "Structural Colour Decoration of the Interior of Public Buildings." Mr. Walter Crane occupied the chair. The title, Mr. Horsley said, made him at once think of two kinds of public buildings, namely, first of those buildings which had been constructed of such materials as to carry out a previously conceived scheme of colour decoration, the floors, the walls, and the roofs having been constructed of materials which make up a colour effect; and, secondly, those buildings, which after their completion in the rough, had been decorated in colour in a manner which made that colour one with the materials. Therefore, they might consider the subject in two parts or divisions:—1. Those buildings whose actual materials formed a colour scheme, such as the Duomo at Siena. 2. Those buildings which on their completion had been decorated in colour in a manner which made that colour one with the materials of the building, such as St. Francesco at Assisi, or the Borgia apartments in the Vatican. But these two kinds of decoration might overlap and react upon one another, for, of course, one building might represent both. A cathedral, a church, a parliament house, a town hall, a theatre, a railway station, all come within our view and opened a wide field for consideration.

The methods of decoration possible under these two main heads were very various. The colours of the stone and wood used, fresco, tempera, oil paint, plaster work, sgraffito, mosaic, tile work—all had a claim to a place in our thoughts. But although this wealth of art methods was open to our use, and we had intimate knowledge of its processes, there were but few public buildings in this country which had any structural colour decoration, and there was but little demand from the public for works of the kind. It was remarkable that since the sixteenth century in England the practice of decorating in colour all our buildings, both public and private, as a natural and expected action, had declined; as if our countrymen, who lavished colour in cathedral and castle during the centuries preceding the Reformation, had suddenly lost all hearty desire to beautify their buildings in this particular way.

It had been said that the revival of letters 400 years ago made it no longer so necessary that the walls of public buildings should furnish a literature for the people, and thus a great incentive to noble, historical, and allegorical painting died. Together with the sciences, the painters became learned and conscious. The naïveté of the earlier masters changed to greater care in exactness of representation, but with the old impossibility of the human race to do all things well and perfectly at one and the same time, their works lacked the simplicity and dignity of the earlier period. Architecture thought more of itself and less of the other arts which had previously combined with it to form an organic whole.

On the other hand we had, however, to notice that the Continent had never lost in the same degree as ourselves its interest or delight in the use of colour decoration. Changes not dissimilar to our own had taken place, but the arts of architecture and painting never lost touch one with the other as they did here. In Italy to this day a colour scheme in a new building had a prominent place. In France, a church, a mairie, or a theatre—even a railway station—was not considered complete until it was painted in tempera or with canvasses, "marouflé," so that they formed part of the building. Such conditions as these might also be found in Germany and Austria. England alone seemed with but few exceptions to disregard colour as a necessary element of beauty in the designs of the interior of her public buildings.

Considering first those buildings whose actual materials formed a colour scheme, this was a method of decoration more in favour with the last generation of art workers than at the present day. We were reminded of the buildings of the "Gothic revival," of the works of Butterfield and Street; buildings which were the result, no doubt, of visits to Italy, where their prototypes may be found. The results obtained were often cold looking, harsh, and mechanical, owing perhaps to the mathematical accuracy of modern building methods, but there was a principle underlying it all which could not be lightly dismissed. Butterfield did not introduce his coloured work with the sole intention of breaking up the appearance of the wall surface: his aim was to get a parmanent wall decoration, one which would outlast the usually improperly made plaster wall covering. He set himself to produce something suitable, lasting, and easily kept clean. He did this admirably. Take, for instance, the wall surface at All Saints', Margaret-street. First there was a dado of full colour some 5 ft. high of tiles, above large scenes from the New Testament painted on tiles. Above the arches of the nave arcade the wall surface was stone inlaid with bold patterning in tiles and dark inlay. On the east wall only was there any painting—frescoes by Dyce in panels spaced between margins of alabaster. The roofs were vaulted and painted in the chancel, and painted wood in the nave. With the exception of the pictures on the east wall there is not a scrap of plaster in the church, and no one would deny that the scheme is interesting and good. In Keble Chapel there is a very similar scheme, but in materials more precious, as befitted a college chapel of such importance. Here the lower part of the wall had an arcading of stone, with the spandrels formed of coloured bricks. Above a height of some 10 ft. from the floor were pictures in mosaic, framed in stone, forming a large and striking frieze running round the chapel; above it windows filled with painted glass at some height, therefore, from the floor; between and above these were more bands of coloured brick. The roof is vaulted, painted to represent stone. Here again, therefore, except in the painted roof, the ground of which, he suspected, was in well-made plaster, there was no plaster used, and the whole effect was one of great dignity. To our eyes, nowadays, such a method as this would require to be carried out on the broadest and simplest lines; we should also demand that the materials should be worthy. The black, white, and yellow bricks of fifty years ago had few charms for us now. It was open to us, however, to use the differently coloured stones we had, or our own native marble, while, thanks to the discovery and reopening of some of the old Greek and African marble quarries by men of energy and foresight like Mr. Samuel Brindley, of Messrs. Farmer & Brindley, ancient sources of supply were no longer closed to us. So long as we arranged the materials at our hand, be they of clay or stone, with breadth and simplicity, we should be treating them with the dignity they deserve; and in buildings of importance we should be treating ourselves with greater consideration if we invested our patterns with some meaning and intention.

The second division of the subject—buildings which, on their completion, had been decorated in colour in a manner which made that colour one with the materials of the building, offered a larger field for examination. It brought us into touch with the methods employed by our fellow artists the painters, and other art workers. In this class of decoration conspicuous success had attended the efforts of some of the municipalities of the country. Manchester was most fortunate in having commissioned Ford Madox Brown to paint the scenes from her history in panels in her Town Hall. Glasgow was employing some of her own sons, Messrs. Henry, Lavery, Walton, and Roche, in her City buildings. The Corporation of Liverpool, acting wisely on the advice of their architect,

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had commissioned Mr. Charles Furse to paint the pendentives of their large dome, illustrating scenes from the commercial greatness of their town. Birmingham had commissioned some of the students of her Municipal School of Art to paint scenes of history in panels in the Town Hall. The Corporation of Colchester, also, in the new Town Hall, on the advice of their architect, Mr. Belcher, was employing the master of the Art School to decorate the council chamber and Moot Hall under his supervision and with his assistance. In London, in our own Royal Exchange, the Corporation of the City of London, together with some of the great City companies, had commissioned artists to paint the panels of the ambulatory. For some years past the municipalities of our towns had been fostering a love and appreciation for our arts by buying pictures and placing them in suitable galleries. This virtue of acquiring beautiful things had now been supplemented by the further step forward in giving commissions for mural painting.

Before speaking of different forms of painting available, he would like briefly to touch upon the possibilities offered to us by the use of marble, mosaic, and plaster, stucco duro and sgraffito. These were so closely allied to the first division of the subject, that he would speak of them here. We knew that the Egyptians, Greeks, and Romans used colour largely in their buildings, but we could have but little idea of the magnificent effects often attained by means of their fresco painting, encaustic painting, tempera, modelled plaster, mosaic, marble linings, and veneering, bronze, ivory, gold and silver, overlaying, and inlaying. In considering the use of mosaic at the present time, they might hope that the modern habit of preparing mosaic tesseræ face downwards on a sheet of paper laid on a flat table, and then pressing the sheet of paper into position had been finally given up. Sir William Richmond had shown in the work which he had done that there was no more trouble, and no appreciable loss of time in doing mosaic work in the only true way, viz., pushing it in tessera by tessera from the front.

Time would not permit him to speak of modelled plaster and sgraffito in any detail, except to express the satisfaction they must all feel that these ancient arts of tried quality were understood and worked in a modern spirit to-day. As to the principal methods in use by painters, probably the world had never seen a more beautiful method of painting than Buon or true fresco, but, alas, its use had not been fully justified in this country.

As Professor Church had told them—"In the case of a dry wall, free from soluble saline matter, and exposed to a pure atmosphere, fresco may remain good for centuries. But in air contaminated with the products of the combustion of coal and gas and with tarry and sooty impurities, a fresco picture soon perishes. The binding carbonate of lime is converted into the sulphate, breaking up the paint. The same causes will form sulphate of magnesia from the carbonate of magnesia in the plaster, and the paint will scale off." In our large towns, therefore, to-day, Buon fresco had no chance of lasting.

The stereochrome or water glass process promised better, but we had very little experience of its behaviour.

In the consideration of the possibilities of tempera painting they were on surer ground, no longer so fearful of the consequences of the contaminated atmosphere of our towns.

The paintings by Mr. Gambier Parry at Higham and Gloucester Cathedral, Lord Leighton's "Arts of War" and "Arts of Peace," at South Kensington, and seven paintings by Ford Madox Brown, in the Town Hall of Manchester, were examples of this method. They appeared to be standing well. Professor Church considered that a sound medium was to be found in the proportions of—

	ozs.
Oil of spike	12
Paraffin wax	4
(The two mixed by heat.)	
Copal picture varnish	20

He advises the pigments being mixed in blown linseed oil, rather than in the medium itself, as Parry recommends. It was but a step from these wax and oil mediums to the method generally adopted by painters to-day; he referred to the prevalent custom of painting in oil on canvas, and then, on completion of the picture, having it fixed, or *marouflé*, as the French call it, to the wall or ceiling; the colours used being simply oil colours, with a medium of wax and turpentine. Some of the modern works of this class had been painted entirely in the studio; a practice which must surely carry with it its own condemnation. It was not possible for the painter to be confident as to the correctness of his scale or of his colour, both of which must surely be influenced by the size and lighting of the building, an intimate knowledge of which is revealed by working in it. Could they suppose that the ceiling of the Sistine Chapel would have been so magnificent as it is if it had been painted in a studio and then fixed in position? It was to be hoped that the convenience of this modern method of wall painting would not deter painters from working directly on the plastered wall in tempera, oil, or encaustic. If the beautiful qualities of fresco were denied to this country, there were yet the qualities inseparable from a plaster ground, which a canvas surface could never present quite in the same way.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

THE tenth meeting of the Discussion Section of the Architectural Association for this session was held at 56, Great Marlborough-street, W., on Friday last week, Mr. R. H. Weymouth presiding. The minutes of the last meeting were read and confirmed. The Chairman announced, with much regret, the decease of Mr. H. Rose, who was an old and valued member of the Discussion Section. Mr. Geo. H. Smith proposed that a letter of condolence be sent to the family of the deceased gentleman, expressing the sympathy of the members of the Section.

The Chairman then called upon Mr. Vivian H. King to read a paper, entitled "Design in Furniture," which is printed in full on another page.

The discussion was opened by Mr. W. Bonner Hopkins, who said it had been a great treat to listen to Mr. King's most delightful paper, and he proposed a hearty vote of thanks. He thought it was a difficult matter to make furniture expressive in design, and that designers were often the puppets of the times, having no control over circumstances. Much was to be learned from the study of the best old work, and he thought the worst period of furniture was that when little or no attention was paid to old work. He had a great objection to the so-called "new art," and thought we were suffering from too much individuality. The highest form of art should be unconscious.

Mr. H. P. G. Maule, in seconding the vote of thanks, said Mr. King's paper had brought to their notice many important and interesting points. Furniture should show thought and suitableness for its purpose. In designing furniture we should pay great attention to health, and avoid recesses and dust traps.

Mr. Geoffrey Lucas, in supporting the vote of thanks, said we should consider the "moving of furniture" in our designs. He found a great difficulty in obtaining a satisfactory bedstead, and thought some contrivance might be devised for hanging one's things at the foot of the bed.

Mr. W. A. Forsyth said the reader of the paper brought home to architects the necessity of studying furniture in order to obtain scale in their rooms, and that more attention should be given in planning to the disposition of furniture. He objected to veneer, and thought all designs should be constructional.

Mr. Weymouth, in supporting the vote of thanks, said Mr. King had covered a wide field in a very able manner. He was afraid it was impossible for architects to take up furniture designing in addition to their multifarious other duties. In the best periods the furniture was designed by cabinet-makers, not architects. The work of architects was often heavy and unsuccessful. Some beautiful effects were produced by ebony and mother-of-pearl inlay. He would like to see stamped leather work more generally used, and thought gilding was very suitable. He could not agree with Mr. Forsyth in condemning veneer.

Mr. Phillips said, as an enthusiastic student of furniture, it had given him great pleasure to come down and listen to Mr. King's excellent paper. In primæval times, perhaps the stool was the earliest piece of furniture called into use, and he thought the ball and claw chair might be traced to the stool with the skin of an animal placed over it with the legs hanging down in front and back. From the twelfth to the fifteenth century there was a strong feeling of Saracenic work in some of our English furniture side by side with Gothic; for instance, the "Saxon" chair at Warwick and the chair of Erasmus. The Stuart chairs showed marked evidence of Roman influence. He greatly admired the use of the scallop shell ornament in Tudor work. The best old work always showed a sense of fitness and proportion. The French furniture of Louis XIV. and XV. periods was marked by great extravagance of ornament, and he thought one came back with redoubled pleasure to well-designed, plain, and simple pieces of furniture. The architect had not always been a success in furniture design.

Mr. Guy Dawber, the Special Visitor of the evening, remarked upon the extreme thoughtfulness of Mr. King's paper. He thought architecture had in all times influenced furniture. In the sixteenth century we had the Renaissance, which was followed in the seventeenth century by the Classic revival. In the reign of William and Mary there came a great influx of foreign furniture into our country, but with Queen Anne we found furniture again following architecture. Wren's school of carving influenced the work all over the country. He thought that much of the furniture that was attributed to Chippendale was the work of other men, and that Chippendale came into prominence through the publication of his book, which was a collection of designs in use amongst the cabinet-makers of his day. Prior to Chippendale we have the published work of one William Jones, an architect, and it was interesting to note that at a mansion in Gloucestershire the original signed drawings of some work designed by Jones were still in the possession of the owner of the mansion. He instanced the influence the work of Robert Adam had on the furniture of the period, and attributed the lack of design in the furniture of the nineteenth century to the absence of tradition amongst architects. It was a period of revivals. The domestic architecture of the present day was much more hopeful, and would influence furniture design. Architects should study the disposition and arrangement of furniture, but the craftsman should be unfettered. Simplicity and adaptability should be studied in design, and every attention should be paid to proportion and delicacy of ornament. It was also necessary to study the adaptability of shape and form to the material employed. Inlay should be used, but should be architectural in feeling. Mr. Dawber instanced the very successful work of some men of the present day.

The vote of thanks to the author was made to include the Special Visitor, and was passed with acclamation.

The next meeting will be held at 56, Great Marlborough-street, W., on the 14th inst., when Mr. H. C. Lander will read a paper on "Co-operative Homes."

THE SANITARY INSPECTORS' ASSOCIATION:

EVOLUTION OF THE LONDON SANITARY INSPECTOR.

THE usual monthly meeting of the Sanitary Inspectors' Association was held at the Carpenters' Hall, E.C., on Saturday, Mr. T. Young (vice-chairman of Council) presiding.

After the election of a number of members and associates, Mr. A. G. Duck, Chief Sanitary Inspector of Woolwich, read a paper on the "Evolution of the London Sanitary Inspector." The London Sanitary Inspector, as they knew him, was a comparatively recent statutory designation. There were no prehistoric specimens, and the present-day action of an intelligent inspector was never heard described as fossilised, but rather the reverse, in the respect that he was generally considered in advance of the times. This recent creation was due to a progressive demand, called into existence mainly by the aggregation of the masses into small areas, and the march of civilisation. In dealing with the term "London," it was necessary to understand the area that was referred to. Much of the district with which they were familiar under that designation was formerly fields, and in many respects quite rural. Our present County of London, with its area of 118 square miles, in 1800 contained less than 1,000,000 people; the last census taken in 1901 gave a population of nearly 5,000,000. The City of

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London was of great antiquity, and enjoyed many exclusive privileges. At an early date it realised in a measure its responsibilities, and made by-laws relative to matters pertaining to public health, cleansing, &c. How they were enforced and carried out may be open to question, which may be partially solved by the consideration of a small book published in 1741, entitled, "A Citizen's Complaint against Public Nuisances." This appears to be what they should describe now as a series of complaints, in which the said citizen called attention to the serious condition of the slaughterhouses in the city and suburbs. He referred at great length to the keeping of swine, which were noisome and offensive creatures, liable to cause infectious and contagious distempers. There were, he says, "from two to three hundred of these animals kept in styes, no further off than Whitefryers, near the Temple." He also made reference to the pollution of the atmosphere of the City of London by the soap boilers and tallow chandlers, and made an attack on a person he describes as "Mr. Scavenger, or his deputy," who, he said, "is not so ready to perform his duty as to take his money," and deems it very hard that he should have to pray and pay. "The Society for the Promoting and Reformation of manners in the Cities of London and Westminster" complained in 1721 of an abuse "caused by butchers and poulterers setting up shops and stalls in the best and most public (as well as private) streets, from one end of this great town to the other; this practice increases so much every year that if not put a stop to will, in little time, be one of the greatest nuisances among us. Happy would be the people if the removal of nuisances could be obtained without the delay and expense that attends it." It appeared, judging from these complaints, that the Corporation were not all that could be desired at that period by the sanitary reformers.

Until the latter part of the eighteenth century, and even until 1855, the local government of London, the administration of any laws that had relation to health, was extremely unsatisfactory; each district went on in its own way, obtaining its own Acts of Parliament to suit its own local conditions, and more especially the convenience, he respectfully suggested, of the then local administrators. In the present London area, therefore, there must have been hundreds of local Acts. In this connection there was an attempt at reformation in 1817 by the passing of the General Paving (Metropolis) Act, also known as Michael Angelo Taylor's Act. Prior to this, scant references were made to nuisances as they were now acquainted with the term.

After a reference to the duties of sanitary inspectors in the administration of the Adulteration Acts, Mr. Duck expressed regret that a position on the Examination Board for Sanitary Inspectors was still denied them. Chemists, engineers, architects, and doctors were all examined by a board of experts in their own professions. Sanitary inspectors were examined by any but sanitary inspectors. Evolution must, he urged, assert itself in this particular, and eventually right this wrong. That Association had not ended its work, but had now developed into healthy and thorough working order, thanks to their most able pioneers.

Mr. Duck was, on the motion of the Chairman, thanked for his paper, and the Association afterwards discussed in committee a scheme of federation with other sanitary inspectors' associations.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on the 3rd inst., Mr. Percy Griffith, President, in the chair, a paper was read on "British *versus* American Patent Law Practice and Engineering Invention," by Mr. Benjamin H. Thwaite. The author in his prefatory remarks pointed out that during the nineteenth century and up to the seventies British engineering was supreme, and that the railway, gas, sewage, and other undertakings—the productions of British inventors of the early part of the Victorian era—were almost exclusively designed and constructed by British engineers and with British constructional machinery. At the end of the last century the marvellous progress of the Americans displaced England's industrial supremacy, especially in metallurgical and engineering developments. Much of the engineering work that was once controlled by British engineers was now being carried out by American engineers. The progress of American manufacturing and engineering industry was directly due to the encouragement held out to inventors by the successive United States Governments from the time of Washington. The encouragement given to American inventors by the Act of 1861 had rewarded Americans with a wave of unequalled prosperity. The author pointed out that the British policy in reference to the inventor was quite different from that of the United States; that whereas the British inventor might obtain a British patent, which was merely a registration of date and the printed disclosure of the invention, and for which, for a period of validity of fourteen years, he had to pay no less than 99*l.*, the American inventor was given, for the sum of 3*l.* odd, the benefit of an unprejudiced examination and investigation by technical experts. If the patent passed successfully through that ordeal the inventor had to pay an additional fee of 4*l.* for which he secured, without any further payment whatsoever, the right to the patent for a period of seventeen years from the date of application. The chances that an American patent would pass safely through a law contest were 74 to 100, whereas the chances of the British patent being found valid were only 58 to 100. To demonstrate the deadly effect of the yearly taxation of the British patent system, the author stated that of the 138,517 British patents applied for during the last five years, some 104,000 became void in the fifth or sixth year from the date of the application, and the British Government would have drawn in fees from those abandoned patents nearly three-quarters of a million sterling. In ten recent years the profit surplus earned by the British Patent Department was over one million sterling; while the American Patent Department earned a profit of 275,000*l.* The author referred to the economic policy of the United States manufacturers, which explained the reason why comparatively modern plant was often replaced by new appliances which earned increased profits by their improved efficiency. He recommended the adoption of the American patent system, which policy would stimulate the inventive characteristics of the British race. He referred to the 1901 Committee appointed by the present Government to inquire into the British patent system, and gave their main conclusions and opinions, which were strongly in favour of stringent legislative revision; and he called attention to the recent introduction into the House of Commons, by the Government, of a Bill having that object. In his final remarks the author observed that so long as England had the trade of the world practically to herself she could handicap the representatives of her industries with almost intolerable burdens with impunity, but those burdens must now be removed, or England's champions would be compelled to cry "peccavi," and retire discomfited from the arena.

THE INSTITUTION OF JUNIOR ENGINEERS.—The members of this Institution recently paid a visit to the new baths and washhouses of the Metropolitan Borough of Fulham, shortly to be opened, and situated in Melmoth-place, Fulham-road. The architect, Mr. H. Dighton Pearson, A.R.I.B.A., showed them over, and fully explained the numerous features of interest. There are eighty-four private baths; a swimming pond, 60 ft. by 20 ft.; one 100 ft. by 30 ft., with folding dressing-boxes; and another 125 ft. by 33 ft.; establishment laundry; public wash-house for sixty-six washers; hydro-extractors and drying-horses; ironing-room; three Galloway boilers, economiser. The chimney is 80 ft. high, and there is a water storage tank for 41,000 gallons. Steam is taken from boilers to hot-water heaters under each set of private baths. The ponds are heated by steam ejectors; the building by hot-water radiators. The Artesian wells are worked by air-lift pumps. The building contract was let to Mr. Charles Wall, of Chelsea, for 42,953*l.*; the engineering, electric lighting, well-sinking, and pumping machinery, cost 15,000*l.*—The next paper is to be read on Friday, March 14 (postponed from March 7), the subject being "The Uses of Engineering Models," by the Chairman. On the following evening the Annual Conversazione takes place (postponed from March 8).

THE CAERWENT EXPLORATION FUND.

FROM the recent report of the Excavation Committee in regard to the work carried out by the Caerwent Exploration Fund during 1891, we learn that the field adjoining to the North Gate has been purchased by the President, Lord Tredegar, and excavations have been carried on in this field as well as in the field already in their occupation. The cost of the work in this North Gate field has been entirely defrayed by Lord Tredegar; and the funds contributed by the subscribers have been expended in completing and extending the work begun in 1900, in the nine-acre field in the south-west quarter of the city.

The work of the year has consisted, therefore, mainly in the excavation of the west wing of House II. and of the whole of a large house, which is numbered VII. on the plans, and in opening out the North Gate, and in excavating the field to the south of it. The gateway had been filled at some later period with capitals, corbel stones, and massive blocks, doubtless from the ruin of some adjoining building. A curious passage or culvert of massive stone slabs leading down to the gate has also been uncovered. The field adjoining the gate contains several buildings, the excavation of which is nearly completed. There is work still to be done on the site of the street or road leading through the gate, which presents some curious problems of levels; and the outside of the gateway, where the spring of the arch is still visible, has yet to be explored. The Committee, therefore, have postponed all detailed report of this portion of the work until next year, when it is hoped that the completion of the excavations may have provided a solution of the difficulties.

The two houses (II. and VII.), of which complete plans and detailed reports were presented to the Society of Antiquaries on January 16, and will shortly be printed and issued to all subscribers of a guinea and upwards, were of unusual interest. They were both large houses of the courtyard type, but they differed from the type commonly found at Silchester, in having suites of rooms arranged round all four sides of the central court, whereas at Silchester the courtyard type of house usually has rooms on three sides only. In House II. a large and very interesting hypocaust was found in which the *pilæ*, each formed of a single stone, actually rested on a tesselated pavement (still intact) of the earlier house. This hypocaust was doubly interesting owing to the fact that the floor and the overlying pavement were still *in situ*, and afforded a good example of the method of supporting the floor. A portion of the hypocaust has been removed and re-erected in the temporary museum. The other most important features in this house were a channelled hypocaust and a series of small baths, in one of which the leaden drain-pipe was still to be seen as it passed through the wall.

It is hoped to resume work early in this summer; but the funds raised last year have all been expended, and it will be necessary to raise a large sum—at least 300*l.*—to enable the Committee to complete the excavation of the nine acres already in their occupation.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, S.W., Mr. A. M. Torrance, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council 7,860*l.* for street improvement; Lambeth Borough Council, 8,860*l.* for paving works; Southwark Borough Council, 6,150*l.* for electric light installation and 6,725*l.* for street-lighting purposes and meters; Woolwich Borough Council, 600*l.* for paving works; Finsbury Borough Council, 2,000*l.* for contribution towards cost of purchase of Alexandra Park; Islington Guardians, 15,000*l.* for the erection of an infirmary; and Mile End Guardians 1,600*l.* for various purposes.

Petition as to Working Class Dwellings.—Dr. Collins presented a petition signed by 400 inhabitants of St. John's Wood praying that houses for the working class should not be erected at Grove End-road. The petition was signed by Sir L. Alma Tadema, R.A., Mr. McWhirter, R.A., Mr. G. Frampton, R.A.,

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Mr. Alfred Waterhouse, R.A., Mr. Phil May, Canon Duckworth, and others.

Local Taxation.—The adjourned Report of the Local Government and Taxation Committee was again before the Council. It dealt at great length with the proposals of the Royal Commission on Local Taxation, and the Committee made twenty-seven recommendations. Recommendation "a" was "That it is desirable, in the interest of uniformity, that the valuation authority for the administrative County of London should be appointed by the London County Council."

Mr. Cousins moved as an amendment that the words "be appointed by the London County Council" be struck out, and the following words substituted—"consist of members appointed by the London County Council, and of the Chairman of each District Committee of the Metropolis."

Mr. Sankey seconded the amendment.

The amendment was defeated, and the recommendation carried.

Votes of Thanks to the Chairmen.—Sir Arthur Arnold proposed that the best thanks of the Council be accorded to Mr. A. M. Torrance, the Chairman, for his courteous and impartial conduct in the chair during his year of office. None of Mr. Torrance's predecessors had been more distinguished for devotion to the interests of the Council and assiduity in its work.

Mr. Beachcroft seconded the motion, and it was unanimously agreed to.

On the motion of Dr. Longstaff, seconded by Mr. N. Robinson, a vote of thanks was passed to the Deputy-Chairman, Mr. M'Dougall.

Mr. W. Crooks proposed a similar vote to the Vice-Chairman, Colonel Rotton, and this was secouded by Dr. Forman, and agreed to.

Applications for Electric Lighting Provisional Orders.—The Highways Committee reported as follows :—

"The Bermondsey Electric Lighting Order is in respect of those portions (namely, the parish of Rotherhithe and the district of St. Olave), of the Metropolitan Borough which are not covered by the order granted in 1899 to the then existing Vestry of Bermondsey. The Order contains a new clause to authorise the Borough Council to provide, sell, let for hire, and fix, set up, alter, repair, and remove, but not to manufacture, lamps, meters, electric lines, fittings, apparatus, and things for lighting and motive power, on terms and conditions to be agreed between the Borough Council and the parties concerned. This appears to us to be to some extent provided for by Clause 76 of the Council's General Powers Bill, which is as follows :—'It shall be lawful for the Council of any Metropolitan Borough being authorised to supply, and supplying, electrical energy, to expend money upon the wiring and fitting, and supplying with wires, fittings, and apparatus, the premises of their consumers or prospective consumers, and to enter into any and carry into effect agreements and arrangements with respect thereto, and to make such charges therefor, whether directly or otherwise, as they may think fit'; and the following clause (77) is to authorise the Borough Council to borrow money for the purpose. We see, however, no objection to the provision being made in the order, as the Borough Council appears to so desire. The Order requires amendment as regards the maximum price, and this we have prepared. We recommend—"That the Board of Trade be asked to insert, in the Bermondsey Electric Lighting Order, the amendment, as regards the maximum price, prepared by the Highways Committee."

An amendment to refer the matter back was defeated, and the Committee's recommendation was then agreed to.

The Rating of Site Values.—The Parliamentary Committee recommended that steps should be taken for the introduction of the Site Values (London) Rating Bill in the present Session of Parliament in the form in which it was introduced in the Session of 1901.

Mr. Beachcroft moved, as an amendment, "that it is inexpedient, in view of the recent rejection on second reading of the Urban Site Value Rating Bill, that the Council should introduce their Bill dealing with the same subject, and that the Local Government and Taxation Committee be instructed to report upon the various proposals made in the report of the Royal Commission for the relief of the ratepayer with a view to some practical and speedy reforms."

A discussion followed, and the amendment was rejected. The Report was agreed to, with an instruction to the Local Government and Taxation Commitee to report upon the proposals of the minority of the Royal Commission on local taxation.

Foreign Manufactured Tram Rails.—The following adjourned Report of the Highways Committee was then considered :—

"We have considered the tenders (referred by the Council on January 28, 1902) for the supply of about 3,250 tons of track-rails, 1,850 tons of slot-rails, 670 tons of conductor-rails, 125 tons of fish-plates, 155 tons of sole-plates, together with the bolts and nuts and other accessories required in connexion with the reconstruction, for electrical traction, of further portions of the London County Council Tramways. The tenders were as follows :—

	£	s.	d.
P. & W. Maclellan, Ltd., Glasgow—Société Anonyme des Acieries D'Angleur, Tilleur by Liege, Belgium	*41,709	10	10
Bolling & Low, London—Phœnix Works, Ruhrort, Westphalia, Germany	42,897	10	0
Edward Le Bas & Co., London—Ougree Works, Belgium	42,935	0	0
P. & W. Maclellan, Ltd., Glasgow—Barrow Hæmatite Co.'s Works ...	50,463	15	0
Bolckow, Vaughan, & Co., London—At the company's works	51,188	8	9
Walter Scott, Ltd., Leeds—Leeds Steel Works	52,587	10	0
J. F. J. Peeters & Son, London—At the firm's works (apparently)	58,381	5	0

* Or, with special lock nuts, £41,742 4s. 4d.

Five other tenders were received ; but, as these were not for the whole of the materials to be included in the contract, they have not been considered by us.

It will be observed that the first and third tenders are for rails made in Belgium, and the second for rails made in Germany, while the others are for rails of British manufacture, and that the difference in price between the highest of the first three tenders and the lowest British tender is 7,500*l.*, while the difference between the lowest of the British and foreign tenders respectively amounts to 8,700*l.*, equal to about 18 per cent. We may state that the quantity of rails specified for in the tenders under consideration would, at the rate to be paid under the contract recently entered into for the supply of the rails required for the Tooting, &c., lines, cost about 59,000*l.*; but in that case it was decided only to accept tenders for rails of British manufacture. The tender of Messrs. P. and W. Maclellan is the lowest, and their proposals as regards times for delivery, namely, 615 tons within fourteen weeks from receipt of order, and 225 tons per week afterwards, are satisfactory ; and we think that their tender for the supply of the rails, &c., with special lock nuts, for the sum of 41,742*l.* 4s. 4d. should be accepted. Should the Council concur with our opinion, it will be necessary for sanction to be given to the employment by Messrs. Maclellan & Co., of the Societé Anonyme des Acieries D'Angleur, as subcontractors. Estimates, amounting in all to 644,350*l.*, to cover this and other expenditure on capital account in connexion with the reconstruction of tramways for electrical traction, were approved by the Council on January 28 last ; and we recommend—(*a*) That, subject to the result of the usual inquiries proving satisfactory, the tender of Messrs. P. & W. Maclellan, Limited, be accepted for the supply, for the sum of 41,742*l.* 4s. 4d., of the track-rails, slot-rails, conductor-rails, fish-plates, sole-plates, bolts, nuts, and other accessories, required in connexion with the reconstruction, for electrical traction, of a further portion of the London County Council Tramways ; that the solicitor do prepare, and secure the completion of, a contract to give effect to the tender ; and that the seal of the Council be affixed to such contract when ready. (*b*) That Messrs. P. & W. Maclellan, Limited, be allowed to sub-let to the Société Anonyme des Acieries D'Angleur the manufacture of the track-rails, slot-rails, and conductor-rails, &c., to be supplied under the contract ; that the solicitor do prepare the agreement prescribed by the Council's standing order relative to sub-letting ; and that the seal of the Council be affixed to such agreement when ready."

Mr. Steadman moved an amendment that the Report be referred back for further consideration. He had seen it stated that the reason why the contract would go out of Great Britain was because of the conditions inserted in the Council's contracts with regard to labour, and accordingly the blame was cast on the trades unions. The Labour members had loyally abided by the decision of the Council with regard to labour, but in the contract before them there was no reference to the conditions of labour. He knew he would be charged with advocating Protection by the line he was taking on the matter, but he was a Protectionist to the extent of desiring to protect British labour against the sweated labour of the Continent. He wanted to know what control the Council would have over the contractor and what standard of wages was to be fixed, because the standing orders did not provide for any standard outside Great Britain. On the points of efficiency and economy, he maintained that Belgian steel was not so strong as English, and would be dearer in the long run. Although the Central London Railway Company got its rolling stock from America, yet all the rails were obtained from England, as they were more durable.

Mr. Gaskell seconded the amendment. The Council had laid down rules with regard to the rate of wages, and he failed to see how they could carry out those rules with a foreign tender. They could not raise the condition of British labour unless they protected it against foreign competition.

Sir Algernon West said that while Mr. Steadman had denied that he was a Protectionist, yet he had tried to make out a case for the protection of the British labourer. He entirely dissented from any statement that anything in the shape of Protection was a benefit to the British labourer.

Colonel Rotton said the last speaker had made an appeal to the Council that principles must prevail. But the principles which had hitherto prevailed in the Council were those of putting into all contracts the clause that the wages paid should be the trade union rate of wages obtaining in the district. They could not carry out the principle in a foreign country.

Mr. Benn (Chairman of the Committee) said they were there as trustees of the ratepayers of London, and they regarded it as a first principle that it was their duty to the ratepayers to get the work carried out at the lowest possible price consistent with quality and the maintenance of those conditions which governed the work given out by the Council. Mr. Steadman must see that this was a thing of give and take, and it would be monstrously injudicious to limit their requirements to the narrow range suggested by his hon. friend. The more the tramways cost the less they would be able to do for their employees, and he might say that only about 9 per cent. of the tramway work had gone abroad. The usual conditions would be inserted in the contract, and if they were not carried out the Council would be able to get as effectively at the contractors as if the work was done in England.

A motion to close the debate was put and carried, and the amendment was then rejected on a show of hands. Afterwards the recommendation was agreed to.

Housing.—The following adjourned paragraphs of the Housing of the Working Classes Committee were then considered, and the recommendations were agreed to :—

"Under the London (Burford's-court, &c., Poplar) Improvement Scheme, 1899, it is provided that accommodation for the 269 persons to be displaced by the carrying into effect of the scheme shall be built on the site belonging to the Council at Preston's-road, Poplar. We submit working drawings, specification, and bills of quantities in respect of two blocks of dwellings (Ottawa and Baffin buildings), for the erection of which we propose that tenders should be at once invited. The dwellings will provide accommodation in all for 360 persons, and the balance of ninety-one will be utilised in connexion with further dwellings on the site, as to which we will report fully at a later date. We recommend that the Housing of the Working Classes Committee be authorised to invite tenders for the erection of Ottawa and Baffin buildings, Preston's-road, Poplar, for the accommodation of persons to be displaced by the carrying into effect of the London (Burford's-court, &c., Poplar) Improvement Scheme, 1899.

We have had under consideration alternative sketch plans of the dwellings to be erected by Viscount Portman on the area to be cleared under the London (Nightingale-street, St. Marylebone) Improvement Scheme, 1899. The Council will remember that the Nightingale-street area is being cleared under Part I. of the Housing of the Working Classes Act, 1890, at the expense of Lord Portman. The agreement between Lord Portman and the Council provides for 'the rebuilding to be carried out by Viscount Portman, or his intended lessees, in accordance with a scheme to be jointly approved by Viscount Portman and the Council, and submitted to and approved by the Secretary of State for the Home Department.' Under our instructions the Council's architect has had several interviews with Mr. F. W. Hunt, Viscount Portman's architect, and has offered various suggestions to assist him in the preparation of his plans. Alternative plan No. 1 provides for the accommodation of 580 persons in two five-story blocks, while alternative plan No. 2 provides for the accommodation in similar buildings of 630 persons in forty tenements of one room, 100 tenements of two rooms, and twenty-five tenements of three rooms. The plan submitted is on a small scale, and it is not clear that all the rooms will be of the Council's minimum sizes of 144 square feet for living and 96 square feet

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for bedrooms. We are of opinion that alternative plan No. 2 should be approved, subject to the Council's minimum sizes of rooms being maintained and to any necessary approval of the Council under the London Building Acts being subsequently obtained. We recommend that the sketch plan No. 2, submitted by Mr. F. W. Hunt, of the dwellings proposed to be erected by Viscount Portman under the London (Nightingale-street, St. Marylebone) Improvement Scheme, 1899, be approved, subject to the living and bed rooms being in no case less than the Council's minima of 144 and 96 square feet respectively, and subject to any approval necessary under the London Building Acts being subsequently obtained."

The following recommendations of the same committee were also agreed to :—

"(*a*) That the estimate of 5,261*l.* submitted by the Finance Committee in respect of the erection of Sylva-cottages, Mill-lane, Deptford, be approved.

(*b*) That the tender of Mr. H. L. Holloway for the erection of the cottages, amounting to 4,767*l.*, be accepted."

"(*a*) That the estimate of 17,305*l.* submitted by the Finance Committee in respect of the erection of Siddons and Stirling buildings, Russell-court, Drury-lane, be approved.

(*b*) That the tender of Mr. H. L. Holloway for the erection of the buildings, amounting to 15,757*l.*, be accepted."

London University.—The Technical Education Board reported that considerable progress had now been made in the reorganisation of London University, and that it was already having a marked influence for good on the polytechnics and other institutions. The advanced classes in science and engineering were being revised and brought up to a higher standard, gaps in the curriculum were being filled up, and more students were being induced to enter upon systematic courses of study, extending over three or four years, instead of attending isolated classes.

The Widening of Piccadilly.—The Improvements Commiltee expressed their regret that certain negotiations with the Commissioners of Woods and Forests had proved abortive, and recommended the Council to pass the following resolution :—"That in the absence of any undertaking from his Majesty's Commissioners of Woods and Forests to co-operate with the Council for securing, upon the expiration of the leases, and at a reasonable cost, the setting back of the buildings on the northern side of Piccadilly, the widening of that thoroughfare to 80 ft. between the Circus and Sackville-street be not undertaken by the Council."

The recommendation was adjourned.

District Surveyors' Districts.—The following recommendations of the Building Act Committee were agreed to :—

"(*a*) That an area southward of Avenue Park-road and Thurlow Park-road be added to the district of Lower Norwood, and that the eastern and western limits of that district be also adjusted so as to render such limits identical with the boundaries of the Norwood ward of the Borough of Lambeth.

(*b*) That the limits of the district of Streatham, East, and Brixton be extended by the addition of so much of the district of South Lambeth and part of Camberwell as is situated southward of Acre-lane and westward of Effra-road, so as to include the whole of the Tulse-hill ward of the borough of Lambeth within the area of the first-named district, and that an area southward of Avenue-park-road and Thurlow-park-road be severed from the district of Streatham, East, &c., and added to the district of Lower Norwood, and that the eastern limit of the former district from Leigham-vale southwards to the county boundary be adjusted so as to coincide with the boundary of the borough of Wandsworth at that part.

(*c*) That so much of the district of South Lambeth and part of Camberwell as is contained within the Tulse-hill ward of the Borough of Lambeth be added to the district of Streatham, East, and Brixton; that the western limit of the district of South Lambeth, &c., northward of Acre-lane, be adjusted so as to coincide with the boundary of the Borough of Lambeth at that part; that the eastern limit be adjusted to coincide with the boundary of the same borough at that part; and that the northern limit be extended by the addition to the district (from the district of West Newington, &c) of so much of the Brixton ward of the borough of Lambeth as is situated southward of Prima-road and Kennington-terrace; that the district as altered be designated South Lambeth, and that an advertisement be issued inviting applications for the appointment of a district surveyor for such district.

(*d*) That the western limit of the district of Camberwell be adjusted so as to coincide with the boundary of the borough of Camberwell at that part.

(*e*) That the eastern limit of the district of Clapham be adjusted so as to coincide with the boundary of the borough of Wandsworth at that art.

(*f*) That the eastern portion of the district of West Newington and part of Lambeth eastward of the borough boundary and southward of the centre line of Newington-butts be added to the district of East Newington and part of St. George-the-Martyr, Southwark; that so much of the district of West Newington, &c., as is contained within the Princes ward of the borough of Lambeth be added to the district of Central Lambeth and North Battersea; that so much of the district of West Newington, &c., as is northward of the borough boundary, and of the centre line of Newington-butts, be added to the district of St. Saviour, Southwark, &c.; and that so much of the district of West Newington, &c., as is contained within the Brixton ward of the borough of Lambeth be added to the district of South Lambeth.

(*g*) That the eastern limit of the district of East Newington and part of St George-the-Martyr, Southwark, be adjusted so as to coincide with the boundary of the borough of Southwark at that part.

(*h*) That the western limit of the district of Bermondsey, St. John, Horsleydown, St. Olave and St. Thomas, Southwark, be adjusted so as to coincide with the boundary of the borough of Bermondsey at that part.

(*i*) That the appointment of Mr. Banister F. Fletcher as interim District Surveyor be terminated on March 31 next; that the District Surveyors, who complete the supervision of works transferred from the supervision of Mr. Fletcher, be required to pay him a proportionate amount of the fees chargeable on such works calculated on the extent to which they have been supervised by him; and that otherwise the alterations of districts do take effect as from the date of the Council's order sanctioning such alterations.

(*j*) That the solicitor be instructed to take such steps as may be necessary to secure the carrying out of the above alterations, which shall be subject to the conditions that any works in progress and any proceedings in progress relating to any dangerous or neglected structure, or any building or structure, in areas surrendered by a district surveyor shall, notwithstanding the transference of those areas from his supervision, continue to be supervised by him until the completion of such works and proceedings, and that no district surveyor shall claim compensation for any diminution of income which may hereafter arise by reason of such adjustments of limits."

The Council adjourned shortly before eight o'clock.

Illustrations.

STUDY FOR THE ARCHITECTURAL TREATMENT OF A BRIDGE.

THIS design formed one of the illustrations to the lecture at Carpenters' Hall on "The Architectural Treatment of Bridges," of which a *résumé* is given in another column.

The treatment of the pier to some extent arises out of that which I proposed for the pier of Vauxhall Bridge, illustrated in the *Builder* of October 5, 1901. It occurred to me that the flat buttress-like projection in the latter design might, as it were, be turned round and set edgeways to the face of the pier, the lamp standard which springs from it being likewise turned round so as to be at right angles to, instead of parallel with, the line of the bridge. Such an arrangement has never, I believe, been carried out, but I think it has a good effect, and is even not without a practical advantage; for while the lights in this position would light the roadway quite as well as in the usual position, the outer lamp would also light the face of the bridge, and define the arch better than when it is left in darkness.

The design serves to illustrate also two points touched upon in the lecture referred to: first, that whatever features follow the raking line of the bridge should be stopped against the piers and not carried round them, the pier being essentially a vertical erection against which the arch-spans and their crowning members abut; second, that where it is desired to mark the parapet and road line strongly, this should not be attempted by the use of the ordinary type of Classic cornice, which is too rigid a feature to be used in such a position, but, as in this case, by something in the nature of a carved frieze.

This design has no reference to any special bridge or any special site, but is merely a study of characteristic architectural treatment.

H. H. STATHAM.

DESIGN FOR A PULPIT.

THIS design for a pulpit, to be executed in marble, obtained for its author, Mr. F. Winton Newman, the 25*l.* prize in the Upper School of Architecture of the Royal Academy, at the close of last year.

It is intended as a pulpit for a large church or cathedral; 6 ft. high to the floor of the pulpit, 9 ft. 8 in. to the top of the book-board; to be approached by a double staircase from two sides, embracing a column of the nave.

The whole of the pulpit up to the top of the book-board is intended to be executed in marble; and all above this height—canopy and supporting pilasters, &c.—to be executed in oak, the large panel beneath the canopy being partially covered with a rich silk hanging.

ST. AIDAN'S VICARAGE, LEEDS.

THIS house was erected at a cost of 2,200*l.*, in a large and rapidly growing parish, consisting of the industrial class.

Owing to the steepness of the site, it was possible to place the entrance-door on a level with the half-pace of the staircase, and to form a separate department for the parish-room, vicar's study, and oratory downstairs, and so to avoid the traffic in connexion with that department entering in any way into the dwelling-house proper, which is situated on the floor above.

The drawing-room and dining-room are separated only by a folding partition, which is usually drawn aside, forming a room some 40 ft. by 16 ft. This arrangement is found useful for various parish functions, and is appreciated in a parish consisting entirely either of small terrace houses or "back-to-backs."

The house is built of Leeds pressed bricks, with Morley stone dressings. The contractors were :—For brick and stone work, Mr. Paul Rhodes; for joiners' work, Messrs. H. Atkinson & Son; for plumbing and painting, Mr. George Thompson; and for tiling, Messrs. Watson & Worsnop. Messrs. Bedford & Kitson, of Leeds, were the architects.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Woolwich—Wood and tile pents over the entrances to eleven houses on the east side and eleven houses on the west side of Admanstock-road, six houses on the north side of Rowton-road, and four houses on the south side of Hinstock-road, Plumstead (Mr. J. Rowland for Mr. Rose).—Consent.

Battersea.†—Rebuilding of Nos. 117 and 119, Plough-road, Battersea (Mr. W. C. Poole for the Dairy Supply Co., Ltd.).—Consent.

Brixton.—A three-story addition to the Stockwel Training College, on the north-east side of Stockwell-road, Brixton (Mr. J. O. Smith for the British and Foreign School Society).—Consent.

Dulwich.—Wood, iron, and glass porches at the entrances to Nos. 45 and 47, South Croxted-road, Dulwich (Mr. W. G. Loe for Mr. J. T. Moss).—Consent.

Fulham.—A porch, with balcony over, at the entrance to the upper stories of a building in course of erection on the south-east side of New King's-road, Fulham, at the corner of Chipstead-street (Mr. R. Groom for Mr. J. Nichols)—Consent.

Hackney, North.—That the application of Mr. G. H. Payne for an extension of the period within which the erection of eight houses, with bay-windows, on the east side of Upper Clapton-road, Hackney, between No. 147 and Moresby-road, was required to be commenced, be granted.—Agreed.

Hammersmith.—Residential flats on the south side of Askew-road, Shepherd's-bush, eastward of Ashchurch-grove (Messrs. Richardson & White for Mr. C. J. Edwards).—Consent.

Hampstead.—A bay-window in front of No. 20, Netherhall Gardens, Hampstead (Mr. F. Pilbeam for Messrs. Kelly Bros.).—Consent.

Islington, North.—The retention of a wood and tile porch and verandah in front of Fairwood, Holly Park, Crouch Hill, Islington (Mr. P. E. Gallagher for Messrs. Gilbert & How).—Consent.

Lewisham.†—Two houses, with shops on the ground floor, on the site of Ringstead House, Rushey Green; and the erection of four houses, with shops on the ground floor, on the south side of Ringstead-road (Messrs. Norfolk & Prior for Mr. C. C. Story).—Consent.

Lewisham.—One-story shops on part of the forecourts of Nos. 143, 145, and 147, High-road, Lewisham (Mr. H. Bignold for Mr. H. B. Atkinson).—Consent.

Norwood.—A building, with a projecting porch and tranteept, on the south-east side of Ulleswater-

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road, Norwood-road, Norwood (Mr. J. R. Manning for the Rev. W. F. Gooch).—Consent.

St. George, Hanover-square.—A stone balcony in front of No. 13, Charles-street, Berkeley-square (Mr. R. G. Hammond for Mr. J. Garlick).—Consent.

Wandsworth.—That the application of Messrs. Gibbon & Moore for an extension of the period within which the erection of one-story shops upon part of the forecourts of Nos. 151 to 169 (odd numbers only, inclusive), Balham High-road, Wandsworth, was required to be completed, be granted.—Agreed.

Wandsworth.†—A projecting tower entrance to an extension of the Baptist Church, Lewin-road, Streatham (Messrs. G. Baines & Son for Mr. R. C. Tresidder).—Consent.

Woolwich.—A wood and iron balcony at the first floor level in front of No. 43, West-park, Eltham (Mr. E. J. Gosling for Mr. B. Firminger).—Consent.

Hampstead.—A shop front on part of the forecourt of No. 150, Finchley-road, Hampstead (Messrs. C. Saunders & Son).—Refused.

St. Pancras, West.—One-story shops on part of the forecourts of Nos. 52 to 64 (even numbers only, inclusive), Kentish Town-road, St. Pancras (Mr. W. Batting for Mr. F. H. Rex).—Refused,

Width of Way.

Fulham.—Reconstruction of No. 2, Argon-mews, at the rear of Nos. 581 and 583, Fulham-road, Fulham, with the external walls of such building as reconstructed at less than the prescribed distance from the centre of the roadway of Argon-mews (Mr. A. Sykes for Mr. S. Appleton).—Consent.

Greenwich.—A one-story office building at the Thames Engineering Works, Greenwich, with the external walls of such building at less than the prescribed distance from the centre of the roadway of John Penn-street (Mr. J. W. Ramsay for the Thames Engineering Works).—Consent.

Norwood.—The retention of a stable building with the external walls of the water-closet attached thereto and the forecourt walls at less than the prescribed distance from the centre of the roadway of Knight's Hill-mews, West Norwood (Mr. F. G. Baxendale for Mr. R. W. Heyward).—Consent.

St. George-in-the-East.—A building on the north side of Great Hermitage-street, Wapping, with the external walls of such building at less than the prescribed distance from the centre of the roadways of Great Hermitage-street and of a passageway leading northward out of that street (Mr. J. Parrish for Mr. A. W. Birt).—Refused.

St. Pancras, West.—A warehouse building on the south-west side of Pleasant-row, High-street, Camden Town, with the boundary of the forecourt at less than the prescribed distance from the centre of the roadway of the street (Mr. L. V. Hunt for Mr. T. J. Brinsmead).—Refused.

Formation of Streets.

Rotherhithe.—(*a*) That the resolution, reported to the Council on January 21, 1902, with reference to the widening of Paradise-street, Rotherhithe-street, Fulford-street, and Seven Step-alley, and the formation or laying out for carriage traffic of a continuation of Seven Step-alley, be varied. (*b*) That an order be issued to Mr. R. J. Angel, sanctioning the widening of Paradise-street, Rotherhithe-street, Fulford-street, and Seven Step-alley, Rotherhithe, and the formation or laying-out of a continuation of Seven Step-alley for carriage traffic, in connexion with the erection of blocks of artisan dwellings . . . . for the Metropolitan Borough of Bermondsey . . . . .—Consent.

St. Pancras, South.—That an order be issued to Mr. C. Barrett sanctioning the formation or laying out of a new street for carriage traffic to lead from Burton-street to Mabledon-place, Euston-road, St. Pancras (for the Metropolitan Borough of St. Pancras). That the name Burton-street (in continuation) be approved for the new street.—Agreed.

Space at Rear.

St. Pancras, South.—A modification of the provisions of Section 41 of the Act with regard to open spaces about buildings, so far as relates to the proposed erection of blocks of dwelling-houses to be inhabited by persons of the working class on the eastern side of a street proposed to be formed in continuation of Burton-street, Crescent-place, St. Pancras (Mr. C. Barrett for the Council of the Metropolitan Borough of St. Pancras).—Consent.

Width of Way, Lines of Frontage and Projections.

St. Pancras, East.—Steel and glass shelters over the entrances to the Camden Theatre, to overhang the public way of Crowndale-road and Bayham-place, St. Pancras (Mr. W. G. R. Sprague for the Camden Theatre, Limited).—Consent.

Marylebone, West.—The retention of a wood and glass covered-way in front of No. 13, Elm-tree-road, St. John's Wood (Mr. W. H. Newton-Mason for Mr. G. Aylwin).—Consent.

Deviations from Certified Plan.

Southwark, West.—Deviations from the plan certified by the District Surveyor, under Sections 13 and 43 of the Act, so far as relates to the proposed rebuilding of the Noah's Ark public-house, on the north-west side of Park-street, Southwark, at the corner of Noah's Ark-alley (Mr. A. Dixon for Messrs. Whitbread & Co., Ltd.).—Consent.

Width of Way and Space at Rear.

St. Pancras, South.—A block of dwelling-houses, to be inhabited by persons of the working class, on the north-west side of Prospect-terrace, Gray's Inn-road, St. Pancras, with the external walls of such dwelling-houses and the forecourt fence at less than the prescribed distance from the centres of Prospect-terrace and Wellington-place (Mr. C. Barrett for the Council of the Metropolitan Borough of St. Pancras).—Consent.

*** *The recommendations marked † are contrary to the views of the local authorities.*

Correspondence.

COMPETITIONS.

SIR,—A friend of mine (not an architect) has suggested to me that the unfortunate results of setting aside an assessor's award in architectural competitions, such as that to which Mr. Hare and Messrs. Lanchester, Stewart, and Rickards refer in your last issue, might to some extent be minimised if assessors, and particularly members of the Royal Institute of British Architects, would agree, by common consent, not to act as assessors unless an undertaking was given that their award would be maintained, and that the designer of the first premiated drawings was given the work to carry out.

FRANK FOSTER.

*** With the first of Mr. Foster's recommendations we agree entirely. The second we think is pushing the matter further than the public will be likely to accept. It would be wiser to confine it to asking for an undertaking that one of the premiated architects should be employed to carry out the building. No doubt, where the assessor is a competent man who has given full attention to the designs, the promoters will in most cases be wise, and will be doing the best for themselves, if they select the architect to whom the assessor has awarded the first premium. But it can hardly be expected that those who are to pay for and use the building should be asked to give up all private judgment in the matter. If it is pushed to that point the public will rebel. The awards should certainly be upheld; but beyond that it is hardly reasonable to demand more than that one of the premiated architects (there are usually three) should be employed. The promoters may have reasons for thinking, for instance, that the second premiated design will suit their purposes better than the first; and they *may* be right in thinking so. Assessors are, after all, human, and are not infallible.—ED.

COST OF ISOLATION HOSPITAL, RICHMOND.

SIR,—In the month of July, 1896, you drew attention to the low estimate of the Richmond Town Council and the Heston and Isleworth Urban Council in inviting competition designs, viz., 9,000*l.* for forty beds at the joint hospital at Mogden. Indeed, you mentioned that it was little more than half the necessary amount.

One of our local papers (the *Richmond and Twickenham Times*), in commenting on the above, wrote; "No doubt the *Builder* is conducted so much in the interests of the architects that some little discount may be allowed for this in arriving at the value of our contemporary's opinion." (!)

The accompanying letter, compiled from the official returns of Heston and Richmond, will show how just your conclusions were; the cost of the building and furnishing of the hospital for the joint districts being a fraction under 20,000*l.*; Richmond's loan debt for building and furnishing alone amounting to 13,000*l.*

J. COCKRAM.

*** Our correspondent encloses a letter bearing mainly on the division of expenses between Richmond and Heston, which does not specially concern us; but it shows the total cost to have been, as we said, about double what was estimated by the promoters of the competition, and is an amusing comment on the sarcasm of the local paper referred to. How one is supposed to be acting "in the interests of architects" by telling people the truth as to what their building will cost them, it is not easy to understand.—ED.

GASOMETERS AND LIGHT AND AIR RIGHTS.

SIR,—Could any reader kindly favour me with their opinion or give the name of any recent law decision relating to a similar case to the following:—

There is a street in a country town, 30 ft. wide, which is a *cul de sac*; at the end are three houses on each side, which have been built twenty years. Recently a corporation have erected a gasometer in open garden ground at the end of the street and at a distance of 39 ft. and 26 ft. respectively from each corner of the end houses. The gasometer is 90 ft. diameter and 60 ft. high, being 50 ft. higher than the glass line to ground floor bay windows. The gasometer is placed east of the property and prevents the enjoyment of a great amount of sunlight and ordinary daylight, besides being a great detriment to the value of the property. The tenants of the houses are now asking for a reduction of their rents since the gasometer was completed.

I shall be greatly obliged for any information to guide me in preserving my rights enjoyed in the property.

A COUNTRY SUBSCRIBER.

BUILDERS' ACCOUNTS.

SIR,—I noted with pleasure Mr. Thos. E. Brown's able letter on the above subject in your issue of the 22nd ult. There are, however, one or two points in it that I should like to refer to.

Mr. Brown—referring to cost books—thinks the most satisfactory system he has had experience of would not commend itself to me. I quite agree with him, and for this reason, the cost books Mr. Brown mentions are, he says, not balanced with the ordinary books of account. Why not? They could be balanced and their accuracy verified to a halfpenny with very slight manipulation.

Again, Mr. Brown accuses me of not going sufficiently into "detail cost," and apparently from his letter is a strong believer in very minute costing. Yet, if so strong on costing, why does he suggest, later on in his letter, that detail on general costs "can be abandoned under pressure or by small builders." If they can be abandoned, why keep cost accounts at all?

For all this I quite agree with Mr. Brown as to his general remarks on "detail costs." The builder who will go into detail on the various items of work and see what each fraction of the whole is costing him, and at the same time keep an eye on the price he fixed for same in his tender, will find the additional expense thereby incurred more than recouped.

Perhaps I might have gone more into detail costs in my book, but Mr. Brown must consider the difficulties I work under. I had to keep in view that this book would come into the hands of all kinds of builders—large, small, and medium-sized. I had to adapt myself to the position. I think Mr. Brown will agree with me when I say that very few builders go into costing as he is evidently in the habit of doing. Again, I think that anyone who has read and understood my book will be able to go into as much further detail costing as he wishes.

There is one other small matter I should like to draw attention to. Mr. Brown thinks the plant journal and ledger should never be dispensed with. The writer of the review of my book (see your issue of 1st ult.) is of the contrary opinion.

JOHN A. WALBANK, A.C.A.

The Student's Column.

PART II.—DRAINAGE.

CHAPTER 9.—SPECIAL JOINTS IN STONEWARE DRAINS, &c.

INNUMERABLE patents have been taken out for the joints of stoneware drain-pipes, and some of the most important of these will now be considered. It ought, however, to be pointed out that special joints are not everywhere looked upon with favour. Thus, the building regulations of the Charity Commissioners specify that "Stanford's or other similar patent jointed pipes should not be used, but the drains should be constructed with tested glazed stoneware pipes with socket joints in cement."

The Stanford Joint (fig. 8) is one of the best-known of the special joints, and is now made by nearly every manufacturer of drain-pipes. It is an ordinary socket joint with rings (composed of ground earthenware or sand, sulphur, and tar) cast in the sockets and around the spigots. The surfaces of the rings are first tarred or greased, and the spigot is then placed in the socket and slightly turned to bring the surfaces close together. The rings ensure a true alignment of the pipes, and the joint is completed with cement in the usual way. An improved form of this joint (fig. 9) has a deeper socket with ample space for cement. The cost of these pipes is about 50 per cent. in excess of ordinary pipes.

Doulton's "Self-adjusting" Joint is on the same general lines as the Stanford, but the surface of the spigot-ring is more convex so as to allow a slight lateral or vertical adjustment in the line of the pipes. The makers supply a special lubricant for use with this joint. The socket and spigot rings must first be wiped clean, and the lubricant must be slightly warmed and applied evenly over the rings with a brush. The makers claim that the laying of these pipes is simplicity itself—"the

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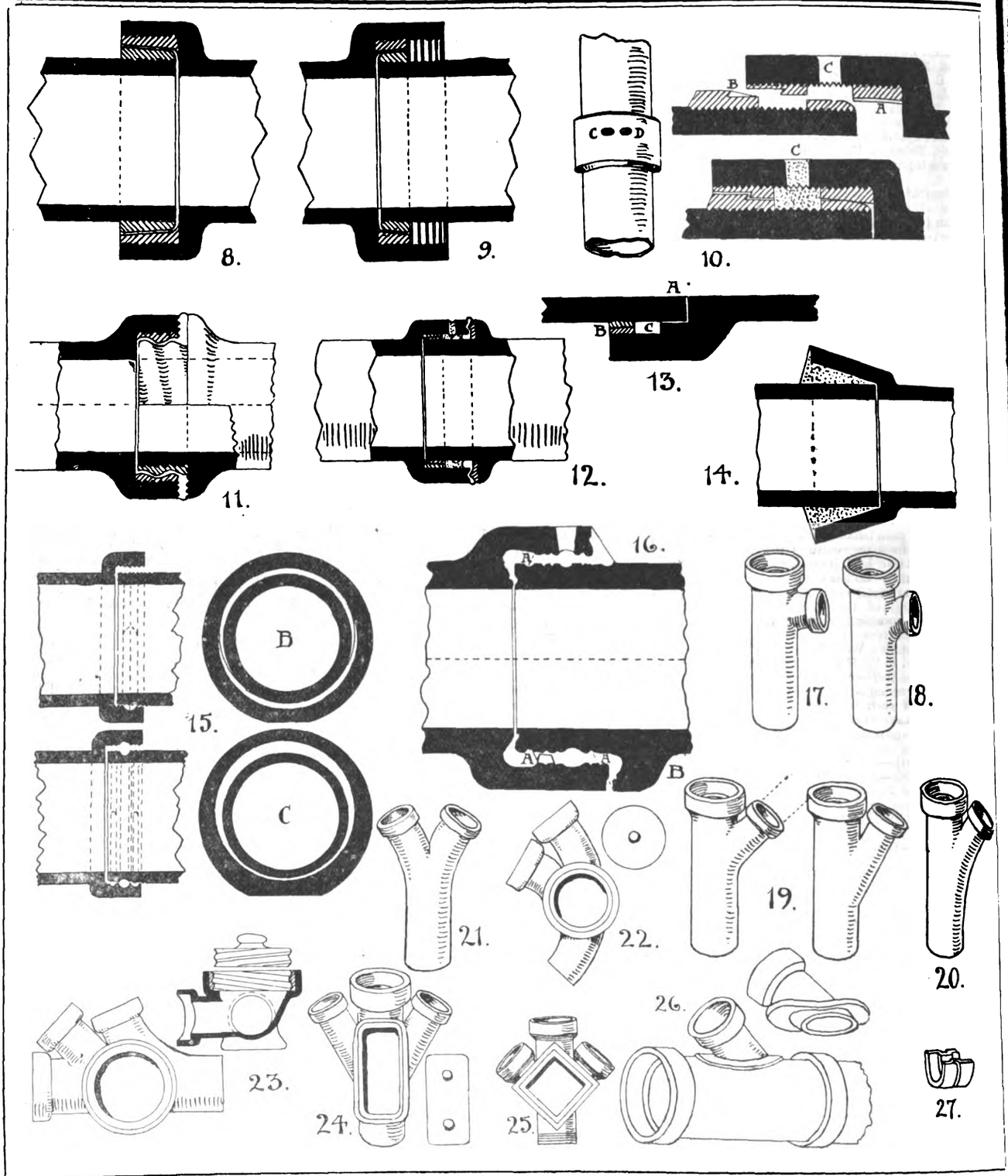

spigot of one having been inserted into the socket of another, the joint is complete, no cement being required." In practice, however, such joints are now generally finished with a ring of cement bevelled off as shown in fig. 7.

Hassall's Single-lined and Double-lined Joints contain somewhat similar composition rings, but additional security is given by means of cement. The single-lined joint is really a Stanford joint with deeper socket, as already illustrated in fig. 9. The double-lined joint (fig. 10) has double composition rings and collars with a space between. A special plastic cement, supplied by the makers of the pipes, is spread on the inner ring A and the outer collar B, and the spigot is then inserted into the socket and pushed home. Liquid cement grout is afterwards poured into the hole at C, in the top of the socket, till it overflows through the hole D. The space E, between the composition rings, is thus filled with cement, and the joint is complete. The pipes are more quickly laid than ordinary socket-pipes, and less cement is required, while at the same time the joint is made perfectly watertight and true alignment of the pipes is secured.

Button's "secure" joint is on similar lines, but the composition rings are keyed into the pipes, and the space left for the cement is formed into a double dovetail by shaping the opposite return faces of the rings.

Sykes's patent joint (fig. 11) has a composition collar of screw shape formed on the spigot, and a composition ring of corresponding shape in the socket. A shoulder is formed on the spigot, and this is covered with plastic composition, which, when the pipe is screwed home, is compressed between the rim of the socket and the shoulder. For heavy pipes special chain tongs must be used to screw the pipes tight. This joint is suitable for straight lengths of drains and sewers, but is not applicable to all the details of house drainage. The only way of obviating the difficulties connected with screwed pipes would seem to be by means of union-pipes with right threads at one end and left at the other, but these do not appear to be made.

Sykes's "new patent" joint has a similar collar on the spigot-pipe, but no screw. The joint (fig. 12) is a modification of the double-lined joint already described. It has the composition collar around the end of the spigot and the corresponding ring in the bottom of the socket. In laying the pipes the ring in the socket is thoroughly covered with grease, and a band of clay or plastic composition is laid on the composition face of the spigot-collar. The spigot is then placed in the socket, and the pipe forced home, either by a crowbar applied at the other end, or by placing a piece of wood across this end, and tapping it with a hammer. The annular space is afterwards filled with cement grout, inlet and overflow holes being formed in the socket as in Hassall's double-lined pipe. The grouting is generally commenced when about a dozen pipes have been laid, and this interval is maintained until the last pipe of the length is in position.

The special joints which have hitherto been considered have composition rings introduced, partly for the purpose of securing true alignment of the pipes. The same object can be attained in other ways. In Green's "Truinvert" pipe (fig. 13) the inner portion A of the socket is of the same diameter as the exterior of the spigot, and a Stanford joint B is formed at the outer end of the socket. In laying the pipes, the inner portion of the socket is brushed over with a waterproof composition supplied

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by the makers of the pipes, and the spigot of the next pipe is then inserted and pushed home; the annular space C is afterwards grouted with cement.

In many special joints composition rings are omitted altog-ther, and true alignment is secured in other ways. Peddie's drain-pipe (fig. 14) is one of the simplest. The sockets are made to diminish from the mouth inwards, the diameter at the shoulder being equal to the external diameter of the spigot. The sockets are large, those for 4-in. pipes being 3 in. deep, 7¼ in. in diameter (inside) at the mouth, and 5⅝ in. at the bottom. The size of the annular space allows a good cement joint to be formed, and as the pipes are made in 3-ft. lengths, the labour of laying is considerably reduced. The sockets are not adapted to bear the weight of the pipes and filling material, and holes must therefore be cut in the bottom of the trench to receive them, so that the weight will be entirely borne by the barrels of the pipes.

The patent "Paragon" pipe (fig. 15) has the socket placed eccentric with the barrel of the pipe. A flat base is formed under the socket, and the trademark is stamped on the crown, so that it can be seen at a glance whether the pipes are correctly laid or not. The shoulder at the invert of the socket is equal to the thickness of the wall of the spigot-pipe, but grooves are formed to receive the cement used in making the joint. The shoulder at the crown is much larger, so that a space is left for the cement between the socket and spigot. These pipes are made in three patterns, known as A, B, and C. Pattern B, with deep socket (fig. 15), is that most commonly used. Pattern A is similar, but with the socket of ordinary depth. In these pipes the main groove for cement is carried around the lower half of the socket only. In pattern C the socket is still deeper, and the groove is continued entirely around it, while a corresponding groove is formed around the spigot, thus ensuring a safer joint. These pipes are made in sizes (rising by 1 in.) from 2 in. to 10 in. in diameter, and (rising by 3 in.) from 12 in. to 24 in. Pipes 6 in. in diameter and upwards are made in lengths up to 3 ft.; the smaller sizes are in 2-ft. lengths.

Ames & Crosta's "single-seal" and "double-seal" joints (fig. 16) have the sockets concentric with the pipes, but studs are formed in the sockets to receive the spigots and preserve true alignment. The shoulder of the socket is of a special shape, and affords an excellent key for the cement. In laying the single-seal pipes, a fillet of plastic cement is laid around the bottom of the socket to the dotted lines A, and the spigot is pushed home. The outside of the annular space is then pointed, and the joint completed by pouring cement grout through the hole provided for the purpose; or the annular space may be entirely filled with cement mortar in the ordinary way. The double-seal joint has a collar around the spigot, as shown at B, and in laying the pipes a fillet of cement must be laid around this collar and another around the bottom of the socket, and the space between must be grouted with cement.

Hutchinson's pipe has an inner socket of oval shape for receiving the spigot and preserving true alignment, the outer socket being concentric with the pipe, and providing the usual annular space for the cement mortar. In Wakefield's pipe two corrugated webs, with a space between, are formed in the lower half of the socket, and the spigot rests on the crowns of the corrugations. Pipes of these kinds can, of course, be laid only in one position if their special features are to be of any use.

Drain-pipes have been made without sockets, the joints being formed by means of loose collars or saddles; but as such pipes require more labour and cement in laying, and are more difficult to make watertight at the joints, they are now seldom used. The new Drainage By-laws of the London County Council expressly state that stoneware pipes must be "jointed with socket joints." The Model (Urban) By-laws specify "watertight socketed or other suitable joints."

Junctions.— Drain-pipe junctions are not now used as generally as in former days. In the best work all important branch drains are now carried separately to junction-chambers, and very few junction-pipes are required where this arrangement is adopted. The worst form of junction is that known as the square (fig. 17); the sewage from the branch meets the sewage in the main at right angles, and thus checks the flow and often causes deposits. Such junctions are prohibited in many districts. The new London by-law on the subject runs as follows:—"A person who shall erect a new building shall not construct the several drains of such building communicating with a sewer in such manner as to form in such drains any right-angled junction, either vertical or horizontal. He shall cause every such branch drain or tributary drain to join another drain obliquely in the direction of the flow of such drain and as near as practicable to the invert thereof."

The "curved square" junction (fig. 18) is very little better than the true square, and ought not to be used. Oblique junctions (fig. 19) are made of various angles, the most common being 45 deg. and 30 deg. Curved oblique junctions (fig. 20) are also made, and are theoretically the best. The "breeches" or "Y" junction (fig. 21) is a good form, especially if made with an inspection eye. Junction bends (fig. 22) may prove useful in special cases; that shown in the illustration is provided with a socket for receiving an inspection stopper or pipe. The junctions illustrated in figs. 17 to 20 are known as "single"; "double" junctions are made of similar forms, but with a branch on each side of the main; the "Y" junction is sold as a double junction.

As already stated, special junction-chambers are now often constructed. The bottoms of these are generally formed with a main channel and as many branch channels as there are branch drains entering the chambers. Instead of the channels, closed pipes are now sometimes used, and the junctions are provided with inspection sockets and stoppers, such as that illustrated in fig. 22. Sykes's access pipes are specially made for this purpose in a variety of forms. We illustrate one form with two left-hand branches in fig. 23. The pipe is 6 in. in diameter, the branches 4 in., and the access eye 9 in.; the latter is fitted with a screw stopper, the threads on the stopper and in the socket being formed of a special composition, after the manner of Sykes's drain-pipe joint. This access eye ought to be of large size, so that clearing rods can be passed through it into the drain if required.

Access junctions are also made with oblong openings for inspection, as shown in fig. 24. Armstrong's inspection openings are square, and are made with 4 in., 5 in., 6 in., and 9 in. outlets, and with one, two, three, or four inlets in each case. In some of the designs one or more of the inlets are at right angles to the main pipe, and are therefore unsatisfactory. A good design with three inlets is shown in fig. 25. The access eyes range from 9 in. to 12 in. square, and special pipes, square at the bottom and circular at the top, are made to fit the eyes; above these ordinary drain-pipes can be continued up to the surface of the ground.

When new drains have to be connected to existing pipe drains or sewers, ordinary junction-pipes cannot, of course, be inserted. The simplest method is to cut a hole in the side of the existing pipe, and insert a saddle junction, as shown in fig. 26. The saddle ought to be bedded in neat cement and entirely surrounded with concrete in order that it may be kept firmly in position and the joint be watertight. The saddle shown is oblique; "square" saddles can also be obtained, but ought never to be used. The flange of the saddle must have the same curve as the exterior of the pipe to which it is fitted. Another method consists in cutting out one pipe in the main drain or sewer, and inserting a socketless junction-pipe of the necessary length. The joint between the lower end of the junction-pipe and the socket of the existing drain can be made with cement in the usual way, and the joint at the other end by means of two half double sockets or collars of the kind shown in fig. 27, made watertight with cement. This joint ought also to be entirely surrounded with concrete.

Junctions with brick sewers must be made with junction-blocks, the inner face having the same radius as the sewer. An oblique block of this kind is shown in fig. 28. The blocks are made to fit either 4½-in. or 9-in. brickwork.

TELEPHONE NUMBERS.—Messrs. Finch & Co., Lambeth, send us a large card containing an alphabetical list of telephone numbers of architects and builders in London, mounted so as to be hung up for reference. The architects' names are placed on one face of the card and those of the builders on the other face.

BOOKS RECEIVED.

THE LAND AND HOUSE PROPERTY YEAR BOOK FOR 1901. (*Estates Gazette* Office.)

THE SEA-COAST; DESTRUCTION; LITTORAL DRIFT; PROTECTION. By W. H. Wheeler, M.Inst C.E. (Longmans.)

ANNUAL RECORD OF THE LONDON TOPOGRAPHICAL SOCIETY. Edited by T. Fauman Ordish, F.S.A. (Published by the Society.)

OBITUARY.

MR. BENTLEY.—We deeply regret to announce the death, on Sunday last, at his residence, Clapham Common, of Mr. John Francis Bentley, in his sixty-third year. Mr. Bentley, unfortunately, has not lived to see the completion of his most important architectural work, the Roman Catholic Cathedral at Westminster, or to receive the Royal Gold Medal for which he was nominated at a meeting of the Royal Institute of British Architects held on February 3 last. The cathedral is now being erected upon a site which formed part of the ground occupied by the later Tothill Fields, Bridewell, which in recent years had been used as a women's prison. The land, covering about 4½ acres, was acquired by the late Cardinal Manning, and the first stone of the new fabric was laid by Cardinal Vaughan on July 1, 1895. The plan and design — of which descriptive accounts are given in our columns of July 6, 1895, February 25, 1899, and June 23, 1900 —are based, in parts, upon those of Constantine's church of St. Peter at Rome, and, as we understand, the architect was given a free hand in their choice and preparation, upon which he bestowed great thought and labour. He passed many months in Rome, Ravenna, and other Italian cities making a special study of (old) St. Peter's at Rome, and of the early "Basilica" churches; but being more deeply impressed with, for his purpose, the cathedral at Murano, St. Mark's, Venice; St. Vitalis, Ravenna; and St. Ambrogio, at Milan; he obtained Cardinal Vaughan's consent, most wisely accorded, to a relinquishment of the initial idea for a church of the former type. Mr. Bentley, who was born in 1839 (not 1840, as has been erroneously stated), began his professional studies as a pupil of Henry Clutton: and his work for the most part has been associated with Roman Catholic churches, seminaries, and other kindred institutions. We will first mention some of the principal buildings of that class of which he was the architect, *viz.*: the church and convent of the Immaculate Conception and of St. Francis, at Bocking Bridge, Essex, built of stone and red brick, after the early decorated style, which was opened in May, 1899; the churches of the Holy Rood, at Watford, a gift of Mr. S. Taprell Holland, of Otterspool, Watford, begun in 1887, and completed and consecrated in July, 1900; Corpus Christi, Brixton; St. Mary, at Kensal Green; and the Redemption with a monastery, at Clapham; also Beaumont College (now a Catholic college conducted by Jesuit priests) with the chapel of St. Stanislaus, Old Windsor; and St. Thomas's Seminary, Hammersmith. Mr. Bentley was the architect for the completion, fittings, and decorations of the Church of St. Francis, at Notting Hill, and for the Clergy House Church and Schools, some years later; of additions to the Church of St. Mary of the Angels, Bayswater; and prepared the designs for a scheme of decoration for the interior of St. Anne's new Roman Catholic Cathedral at Leeds, as illustrated in our columns of March 9 and May 18, 1901, Mr. J. H. Eastwood being the architect of the building. Other buildings by him are Carlton Towers, Yorkshire (completion of interior fittings and decoration); screen and organ-case, St. Etheldreda, Ely-place, Holborn; church in Cadogan-place, Chelsea; turret and spire to Convent Chapel, Portobello-road, Notting-hill; altars and decoration of Spanish Church, Manchester-square; Cardinal Vaughan's House, Westminster. On May 11, 1895, we published an illustration of the silver casket, executed by Mr. Thomas Elsley, after a beautiful and original design by Mr. Bentley, for containing an address which was presented to the late Sir Stuart Knill by a number of his Catholic friends on the occasion of his retirement from the office of Lord Mayor of London. Other examples of decorative design by him will be seen in the mosaics he prepared with his own hands for the Cathedral at Westminster, and in the painting and decoration of the interior of St. Botolph's, Aldgate (1889). In the latter church two conspicuous and successful features of the scheme are the treatment of the fronts and balustrades of the galleries in white enamel, and that of the cove of the roof above each gallery, with, at the springing, a series of figures of boys supporting the coat-arms in shields of many ecclesiastical persons and institutions connected with the domestic and public history of London. In 1890 Mr. Bentley carried out, at a cost of 2,000*l.*, the restoration of the exterior of the fabric of St. Botolph's, Bishopsgate Without, and nine years afterwards designed the monumental tablet set up in that church as a memorial to the late rector, the Rev. William Rogers, with a profile portrait in low relief, the work being executed by Messrs. Farmer & Brindley. We may add that the last-named firm have made a model of the Westminster Cathedral. Mr. Bentley had been in weak

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health for some time, but was not believed to be in any immediate danger, and his sudden death came as a painful surprise to his friends and to the architectural profession. Our illustration, of January 4 last, of the view at the south end is from a drawing by Mr. W. Curtis Green.

MR. DAVID MCGIBBON.—We regret to announce the death, on February 23, at his residence, No. 23, Learmonth-terrace, Queen's Ferry-road, of Mr. David McGibbon, LL.D., aged seventy years, senior partner of the firm of Messrs. McGibbon & Ross, of No. 65, Frederick-street, Edinburgh. Mr. McGibbon, a son of the late Charles McGibbon, Dean of Guild and Master of the Merchant Company, was architect to that Company, and President, in 1899, of the Edinburgh Architectural Association. On April 1, 1899, the University of St. Andrew's conferred upon him, *in absentia*, the honorary degree of Doctor of Laws, as a tribute to his artistic and literary attainments. A native of Edinburgh, he had his earlier education in the High School there, whence he proceeded to Edinburgh University; he then followed his professional studies in both that city and London. He also devoted a considerable portion of time to travelling in France, Spain, and Italy. Of the architectural works designed and carried out in Edinburgh by his firm we should mention the following:—The Girls' College, George-street, 1890-1; additions to George Watson's Boys' College, 1892, with a subsequent enlargement; the Parish Offices; and Petersfield Church, in Dalkeith-road, of which the nave was begun twelve months ago, and for which the plans comprise a church having a capacity for 800 persons, with a church hall, vestry, session-house, and other buildings. Two or three weeks since Messrs. McGibbon & Ross were appointed as architects for the restoration of the cathedral church of Iona so as to afford covered room for over 1,000 worshippers by constructing a new roof for the aisles, south transept, and choir, the present east gable and the gable outline on the face of the central tower being taken as a guide for that portion of the work. As architect to the Merchant Company Mr. McGibbon laid out their feu-ing grounds and built their new schools. He was architect also of the Theatre Royal, the Caledonian Insurance Co.'s offices in George-street, various business premises in Princes-street, and several branch offices for the National Bank of Scotland. As some fruits of his travels on the Continent he brought out, in 1888, a volume entitled "The Architecture of Provence and the Riviera," which we reviewed, with illustrations, on May 18, 1889. He also wrote for private circulation an illustrated work upon "The Abbeys of Galloway." In the interval, 1887-1892, Mr. David McGibbon and his partner, Mr. Thomas Ross brought out their standard work (of which the volumes were reviewed in our columns as they were successively published) upon "The Castellated and Domestic Architecture of Scotland from the Twelfth to the Eighteenth Century." That work they supplemented in 1896-7 with "The Ecclesiastical Architecture of Scotland," reviewed in the *Builder* of March 21, 1896, and October 23, 1897. The illustrations, with views, plans, &c., for the volumes we cite were executed from drawings made, we believe, by Mr. McGibbon's own hand. In August, 1898, Messrs. McGibbon & Ross won the fourth premium of 100*l.* for their plans and designs for the new lunatic asylum at Bangour, for the Edinburgh and District Lunacy Board, upon the award of Mr. W. H. Robertson, assessor to the competition.

MR. GOYMOUR CUTHBERT.—We have, further, to announce the death, suddenly, at Eastbourne, in his fifty-fourth year, of Mr. Goymour Cuthbert, of No. 83, Queen-street, Cheapside, E.C., and Meadow Bank, Blackheath. Mr. Cuthbert was elected an Associate of the Royal Institute of British Architects in 1882. Mr. William Wimble and Mr. Goymour Cuthbert were joint architects of the Royal Courts of Justice-chambers, Strand, illustrated in our columns of January 27, 1883. The building stands opposite the Strand entrance into the Courts of Justice, and was erected for a restaurant, a legal business club, consultation and arbitration-rooms, office-chambers, and so on. The red sandstone of which most of the front was built comes from Aspatria, the granite is from Peterhead. In July, 1898, Mr. Goymour Cuthbert was provisionally appointed to act as joint architect with the late Professor Banister Fletcher for the new Wesleyan Centenary Hall and buildings in Bishopsgate-street Within. After Professor Banister Fletcher's death in July, 1899, Mr. Cuthbert was awarded, upon the recommendation of Mr. Aston Webb, as assessor, in March, 1901, the first premium in respect of his designs and plans, which were adopted by the committee for the new premises. He was Lieutenant-Colonel of the London Rifle Brigade and had received the Volunteer decoration for his services.

THE CATHEDRAL, WESTMINSTER.—We read in the *Tablet* that a donor has purchased from Lord Kinnoull, for presentation to Cardinal Vaughan, the famous "Dupplin carvings," consisting of the fifty-four finely executed choir stalls which originally belonged to the chapel of St. Urban Monastery, near Lucerne, and that the donor undertakes to defray the charges of fitting the stalls in the new Roman Catholic Cathedral.

GENERAL BUILDING NEWS.

METHODIST CHAPEL, OUTWOOD, WAKEFIELD.—A new church and Sunday school have been erected at Outwood, Wakefield. The new building will accommodate 350, and the Sunday school will seat 280 scholars; in addition to which there are five vestries. The total cost, inclusive of furnishing, is about 3,200*l.* The church has been erected from designs by Messrs. Garside & Pennington, of Castleford & Pontefract. The chancel, which is raised from the general floor level, accommodates the choir, and has a communion-table at the end. Over the table is a stained-glass memorial window.

CHURCH BUILDINGS, JARROW.—In connexion with the parish of St. Peter's, Jarrow, the building surrounded by Commercial-road, Chater-street, and Drury-lane—which was originally built for a theatre many years ago, and afterwards used for religious purposes—has been secured by the parishioners of St. Peter's, who have made several internal alterations, and converted it into parish buildings for their use. The main entrance to the buildings is off Commercial-road. On the ground floor is the main hall, which will accommodate 400, and part can be shut off by a movable partition, thus forming a small room for club purposes. At the other end of the hall is a platform having retiring rooms on each side and a store above for books, Church Lads' Brigade rifles, &c. Below is a heating chamber. On the first floor is a club room and a gallery to the hall. The whole of the work has been carried out from the design and under the superintendence of Mr. J. H. Morton, architect, of South Shields. The contractors for the whole of the works are Messrs. Craig & Son, of Jarrow.

CHURCH, NEAR MATLOCK.—The district of Dethick Lea and Holloway is to have a new church erected by the coming summer. The building is to be known as Christ Church, and it stands on the Holloway hillside, overlooking the Matlock ravine. The cost is estimated at 4,000*l.* The foundation-stone was laid on November 2 last year. Mr. J. W. Wildgoose, of Matlock, is the contractor, and Mr. Currey, of Derby, is the architect. The accommodation will afford seating for 400 worshippers, and the building is to be Gothic in style.

CHURCH, STOUGHTON, GUILDFORD.—The final stage of the Stoke Church extension scheme, inaugurated nearly five years ago, was initiated recently, when the foundation-stone of Emmanuel Church, Stoughton, was laid. The plans for the new church were prepared by Mr. W. Gilbee Scott, of London, though it is not contemplated to carry them out in their entirety at present. The new church will be in the Gothic style. When completed it will consist of a nave, divided into five bays, with north and south aisles, and a porch at the west end of each. On the south side of the chancel will be a choir vestry and a clergy vestry. The foundations for a tower are being put in, but this portion of the building will not be proceeded with at present. The lower stage of the intended tower will eventually be used as the organ chamber, a temporary recess being provided in this position for present use. Internally the windows will have red brick dressings, and will be glazed with red light glazing, and the arcades, columns, bases, string courses, and all architectural features will be in Bath stone. The roofs will be open-timbered, stained and varnished. The flooring under the seats will be of wood blocks, and the passages tiled. The roofs will be covered with American green slates. The walls externally will be faced with Bargate stone, with Bath stone dressings throughout. The church will be heated with hot-water apparatus, and the ventilation will be provided by vertical inlet shafts built in the wall under each window opening. The new building will seat about 270. The contractors are Messrs. Webster & Cannon, of Aylesbury. The amount of the contract was 4,290*l.*, but subsequent to its acceptance the committee sanctioned the provision of permanent vestries in place of temporary ones, at an increased cost of 366*l.*

CHURCH, RETFORD.—The plans for the new church in South Retford prepared by Mr. Hodgson Fowler, of Durham, have been approved by the committee, and the contract let to a Sleaford firm of builders.

ASYLUM EXTENSION AND TECHNICAL SCHOOL, PLYMOUTH.—At Plymouth on the 26th ult., Colonel W. Langton Coke, Local Government Board Inspector, held an inquiry, the Plymouth Corporation having asked for powers to borrow 40,000*l.* for the extension of Blackadon Asylum and 10,500*l.* for extending the buildings of the Technical Schools of the borough. There were present Mr. J. Paton (Borough Surveyor), Messrs. Hine and Odgers (architects), Mr. H. J. Snell (architect), and others. The Town Clerk stated that the Borough Asylum at Blackadon was originally built to accommodate 200 lunatics, but with administrative accommodation for officers and others of 400. As a matter of fact, there were at present 280 patients in the Asylum. The plans were explained by Mr. Odgers, who by his estimate showed that for the general block of buildings, reckoning at 6*d.* per cubic foot, the amount would be 23,875*l.*; the isolation hospital, at 9*d.* per cubic foot, 5,013*l.*; drainage, 512*l.*; hot-water apparatus, 1,700*l.*; machinery, hot water, gas service, extra boilers, new fittings in kitchen and laundry, 1,500*l.*; temporary fencing, road-making, fire-hydrants, telephone, &c., 2,000*l.*; furnishing, estimated at 3,000*l.*; architects' commission, 1,850*l.*; clerk of the works' salary, 550*l.* The present accommodation was for 90 males and 110 females, 9 male attendants, and 11 female attendants. By the plans put forward for the extension there would be accommodation for 183 males and 223 females, 25 male and 31 female attendants.—As to the Technical Schools, the Committee of the Schools and the Council had approved of the plans of Mr. J. H. Snell, the architect. The present building was opened in 1891, having been erected as a Jubilee memorial. Mr. Snell then explained the plans for the extension.

SCHOOL, INVERURIE.—The plans for the new school to be erected by Inverurie School Board have been approved. The school, which is to be situated near the Market-square of Inverurie, with a wing to Chelsea-road and the frontage to a new street to be formed, will have accommodation for 660 pupils. The estimated cost of the building is between 6,000*l.* and 7,000*l.* The architect is Mr. A. Marshall Mackenzie, A.R.S.A., Aberdeen. The main feature of the building will be a central hall, 90 ft. in length by 25 ft. in breadth, and having a height of 22 ft. It will be lit by six dormer windows. On each side of this hall four class-rooms, 25 ft. square, are provided for, and at the front, facing the new street, will be another three classrooms. A room for the headmaster is also provided in the front. Cloakrooms for the senior boys and girls respectively will be placed at each side of the hall near the entrance from the new street. At the back of the central hall there will be cloakrooms for the junior boys and girls, and also rooms for the male and female teachers respectively. From the back a porch will lead to the large playground, where shelter sheds for the boys and girls are to be erected. The playground will be some 280 ft. by 300 ft. in extent, and the school itself 165 ft. by 95 ft. In the basement underneath the school there will be a heating chamber. There will be two main entrances from the new street—one for the boys and one for the girls. Other entrances or exits are provided for at Chelsea-road and High-street. The building is to be of Aberdeenshire grey granite ashlar. For the new schoolhouse, in close proximity to the school, the plans have also been approved.

HARBOUR OFFICES, SWANSEA.—The foundation stone has just been laid of the new harbour offices, which, at a cost of 15,000*l.*, are being erected at the corner of Somerset-place and Adelaide-street, Swansea. In response to advertisements, ninety-seven designs were submitted in competition for the work, and the selected design was that of Mr. Edwin Seward. Tenders for carrying out the work were invited, and that of Messrs. Lloyd Brothers, Swansea, accepted. The whole of the area of the building is now up to a level of about 5 ft. above the street. The building, which is Renaissance in character, is being built in red Cattybrook brick, relieved by Portland stone mouldings and dressings. The trustees determined that they would only provide sufficient accommodation for their own requirements, and in consequence the building is but two stories high. There are two main entrances, one from Somerset-place and one in Adelaide-street, the latter giving direct access to the main shipping office, and the former to the solicitors and accountants' department on the ground floor, approached by corridors communicating with a central hall. A stone staircase leads from this hall to the second floor. On the north side, facing Somerset-place, over the accountants' offices, are the engineers offices; and over the solicitors' offices, looking into Adelaide-street, are the superintendent's suite of rooms. The Boardroom stands over the large shipping office below. Lavatory accommodation is provided on both floors, and the whole of the building will be heated by hot-water pipes and radiators. A few open fireplaces will be provided in the rooms of the principal officers. The building will be lighted throughout with electric light. A feature of the design will be a clock tower over the entrance in Somerset-place.

HOUSES ERECTED IN LIVERPOOL.—Mr. William Goldstraw, the Liverpool Corporation Building Surveyor, has issued his annual report. The new houses built during 1901 numbered 1,963, or 390 more than in 1900, and an excess of the average for the past six years of 175. The building of houses has varied since 1895, reaching the highest point in 1899, when 2,358 houses were erected. Since the extension of the city boundaries in 1895, there was a steady increase in the number of houses erected annually until 1899, the comparative falling off during the last two years being coincident with a remarkable outburst of house-building just beyond the city boundaries, in the Garston district. The districts in which new houses were built in 1901 are:—West Derby, 584; Wavertree, 475; Walton, 391; old city, 316 (of which 277 were tenement houses built by the Corporation, each separate dwelling being counted as a house); Toxteth Park, 197; total, 1,963. West Derby is at the top of the list. In 1900 Wavertree occupied the first position. As compared with 1900, West Derby shows an increase of houses erected last year of 211, the old city an increase of 209, Walton an increase of ninety-one, Wavertree a decrease of six, and Toxteth Park a decrease of 115. The increase in West Derby is attributed to the building upon the Oakhill Estate, Old Swan. In 1900 no houses

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under 12*l.* rental were erected, but last year 222 of this type were built (labourers' dwellings built by the Corporation). New houses between 18*l.* to 25*l.* rental are the most numerous of the several types erected last year, the percentage of the various rentals being as follows:—Houses of rental under 12*l.*, 11·31 per cent.; houses of rental from 12*l.* to 18*l.*, 28·43 per cent.; houses of rental from 18*l.* to 25*l.*, 32·24 per cent.; houses of rental from 25*l.* to 35*l.* 22·47 per cent.; houses of rental from 35*l.* upwards, 5·55 per cent. With regard to the general building work of the city, there has been no remarkable change. During last year 464 dwelling-houses, eleven workshops, stables, and other minor buildings, six public buildings, offices, and manufactories were pulled down in the city. No warehouses were demolished.

STOURBRIDGE NEW WORKHOUSE AND COTTAGE HOMES.—At Stourbridge Board of Guardians' meeting recently the Building and Sites Committee brought up a report in which they recommended that the Board should purchase 7½ acres of land as a site for cottage homes for the children at the Heath, at 120*l.* per acre. The recommendation was adopted. The committee recommended the appointment of Mr. Marshall, of Nottingham, as architect for the new workhouse and for the cottage homes. His selection was approved.

THE NEW MUNICIPAL BUILDINGS, CLYDEBANK.—The new municipal buildings for the burgh, situated on Dumbarton-road, are now approaching completion, and the Town Council are arranging for a formal opening. The buildings were begun over three years ago. The suite comprises large hall and lesser hall, public offices for the Burgh officials, police court and police station, library and reading-room. There are also annexes of baths and fire station. Mr. Miller, who was also the architect for the Glasgow Exhibition, was the architect for the buildings. The total cost of all the buildings will be about 55,000*l.*

NEW VARIETY THEATRE FOR GLASGOW.—It is stated that The Empires (Ltd.) Co. have purchased a site in Glasgow upon which they intend to build a large variety theatre. The architect for the building is Mr. Frank Matcham.

POORHOUSE, OLDMILL, ABERDEEN.—Workmen for some time past have been dismantling and demolishing at Oldmill Reformatory the buildings, in order that operations may be started as soon as possible for the erection of the new poorhouse. The architects—Messrs. Brown & Watts—are preparing the necessary specifications.

SANITARY AND ENGINEERING NEWS.

THIRLMERE AQUEDUCT.—The second line of water main from Thirlmere, which the Manchester Corporation have just decided to lay down, will consist of 44 in. diameter pipes capable of conveying 12 million gallons daily. The southern portion, from Manchester to Longridge, about thirty miles, is to be put in hand first, the contractors being Messrs. Monk & Newell, of Bootle, Liverpool.

FENHAM MAIN SEWERAGE.—The Benwell and Fenham Urban District Council some two years ago decided that, owing to the large building developments at Fenham, it was time a comprehensive scheme for the drainage of that part of their district should be undertaken, and accordingly instructed Mr. Harry W. Taylor, of Newcastle-on-Tyne and Birmingham, to prepare plans. These were shortly afterwards adopted by the Council at an estimated cost of 11,500*l.* After considerable delay by the Board of Trade, the plans have at last been approved by the Local Government Board, and tenders are to be invited at once. The sewer will be in a deep tunnel for nearly a mile, the outfall being into the tidal river Tyne at Scotswood. This main sewer will serve a large area, and will no doubt tend to facilitate the building operations considerably.

FOREIGN.

RUSSIA.—The Government and the municipal authorities in St. Petersburg have granted a large sum of money to be devoted to improving the city generally, but with especial reference to the hospital accommodation, which at present is not adequate enough, though St. Petersburg is by no means an unhealthy place. The River Neva requires much more efficient control; the bridge from the city side of the river to the University buildings is being as rapidly built as local circumstances permit, but "temporary" timber bridges, which, in fact, have to last for years, are not very ornamental, and are not creditable to one of the first cities in Europe, especially when the material itself is unsuitable for the purpose, as it is in the case of a river always frozen in winter. We are not surprised that the scope of these improvements include two bridges over the Neva, and that an open competition with large premiums is invited by the municipality of St. Petersburg. Designs will be received in that city by September 14 next, at the Town Hall.

GERMANY.—A marble statue of Count William Bismarck, the late President of the Diet of the Province of East Prussia, is to be placed in the House of the Diet as soon as it can be executed. ——We learn that the pumice-stone-brick industry in the Rhine Province has received an enormous impetus during the past few months, owing to the fact that German architects are more inclined to use the material for partitions in upper stories. It possesses the great advantage of being so light that supporting girders are either rendered unnecessary or need only be of the smallest dimensions. These bricks possess the peculiar property of being nearly sound-proof, and are durable even when used in the exterior of a building.

MISCELLANEOUS.

ELECTRIC LIGHTING, NOTTINGHAM.—Lieutenant-Colonel A. C. Smith, R.E., sat at the Nottingham Guildhall on the 25th ult. to hear evidence in connexion with the application of the authorities to the Local Government Board for sanction to borrow 15,000*l.* for purposes of electric lighting. Among those present were Mr. A. Brown (City Engineer), Mr. H. Talbot (Electrical Engineer), and Mr. F. B. Harris (of the Town Clerk's department). It was stated that the population of the city was 239,753, and that the outstanding debts amounted to 1,338,005. The money in respect of which the application had been made was required for electric extensions during the next twelve months, the items including service connexions, 1,500*l.*; meters, 2,000*l.*; and underground mains, 10,000*l.*

Illuminated figure of Fame formed in front of the Victor Hugo House in the recent celebration in Paris; lined out in "E.L.B." electric lights.

YORKSHIRE COLLEGE ENGINEERING SOCIETY.—Professor J. O. Arnold, of Sheffield, lectured on the 24th ult. before the Yorkshire College Engineering Society, on "The Internal Architecture of Metals," Professor Goodman presiding. The causes of the sudden snapping of steel were traced, Professor Arnold remarking on the fact that the Germans were more attentive to the proper annealing of iron than were the English. The St. Neot's rail, which wrecked the Scotch express, was shown; the rail flew, he said, into seventeen pieces, but it had been down twenty-two years, and ought to have been taken up two years before.

STORAGE OF TIMBER IN LONDON.—A meeting of the London section of the Timber Trade Federation was held at the London Chamber of Commerce on Tuesday, the 4th inst., to decide as to what action should be taken, in the interests of the London timber trade, in view of the London County Council having asked the Metropolitan Borough Councils for an expression of their views as to the necessity for further legislation with reference to the alleged danger to which dwelling-houses are exposed by reason of the storage of timber on the roofs of buildings and against the boundaries of yards where such boundaries are adjacent to dwelling-houses. Mr. C. J. Morgan, Vice-President, occupied the chair, and it having been reported that the matter had already been considered by certain District Councils, Mr. G. T. B. Cobbett stated his reasons for contending that the existing law sufficiently met the requirements of the case. After discussion, it was moved by Mr. Cobbett, seconded by Mr. John Grover (builder), and unanimously resolved:—"That, in the opinion of this meeting, as the London Building Act, 1894, sufficiently deals with the question of the storage of timber, no fresh legislation is necessary for the safety of the public." It was agreed to communicate on the subject of the resolution with the Metropolitan Borough Councils, the London County Council, and the trade Press, other action being left in the hands of a sub-committee.

"INVESTMENTS IN HOUSES AND LANDS."—This small book should have been given, under "Books Received" in our last, as published by Effingham Wilson, not by the National Mutual Life Assurance Society, whose conspicuous advertisement stamped on the cover misled us.

THE VICTOR HUGO ILLUMINATIONS, PARIS.—As already mentioned, the illuminations for the recent Victor Hugo celebration at Paris were all put into the hands of an English firm, the "Electric Lighting Board" Co. The most extensive illuminations were at the Place des Vosges, Place Victor Hugo, and Place de l'Hôtel de Ville. A brilliant effect was produced at the Place des Vosges by means of the company's flexible strips studded with lamps of all colours, and right round the entire Place were arranged electric lighting boards, some ninety in number, on each of which was written in coloured electric lamps the name of one of the poet's works. A figure of "Fame" was seen illuminating the house inhabited by Victor Hugo, the design outlined on the E. L. B. system. The decoration scheme in the Place Victor Hugo was made to represent a Roman circus, and in front of each platform were four poles bearing baskets of electric flowers. From these baskets were suspended garlands of electric flowers stretching from pole to pole and disappearing in the rows of trees beyond. The Place de l'Hôtel de Ville was also illuminated by the use of the Company's strip studded with electric lights shaded by artificial flowers, and the principal buildings, including the façade of the Town Hall, were outlined on the E. L. B. system. We give an illustration of the figure formed in electric illumination in front of the poet's former residence.

THE MANCHESTER BUILDING BY-LAWS.—The Improvement and Buildings Committee of the City Council recommend for adoption the new building by-laws which were at the last meeting of the Council sent back to the committee for further consideration. The committee have resolved unanimously—"That the Council be again recommended to make the amended by-laws, which have been formulated and approved in draft by the Local Government Board." In a report on the matter the Deputy Town Clerk states that "the desirability of amending some of the existing by-laws first received consideration by the Improvement and Buildings Committee in April, 1897. The amendments had reference to the thickness of walls of domestic buildings, and especially of party walls; the construction of flues; the regulation of roof battens; the adaptation of the dimensions of timbers in common use by builders; provision for ceiling joists; the repeal from the by-law as to open spaces in front of houses of the exception in favour of plans approved before June 22, 1890, which became obsolete in 1893 by reason of the enactment of section 19 of the Manchester Corporation Act, 1891, limiting the operation of approvals to a period of two years; amendment of the by-laws respecting down spouts so as to prevent their direct communication with drains; better provision as to ventilation of house drains; better and more complete provision as to the size and ventilation of soil pipes; and an amendment of the by-law relating to plans and sec-

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tions so as to require them to be prepared in a permanent manner and upon durable material. The amendments have, ever since April, 1897, been under the consideration of the Improvement and Buildings committee, and they have been submitted to and approved by the Sanitary Committee, the Manchester Society of Architects, and the Local Government Board, with whom many conferences and much correspondence have taken place." He further points out "the great desirability of permitting the new by-laws to be brought into operation as early as practicable, having regard to the fact that the Committee (contrary to his frequently expressed opinion) have been sanctioning plans in accordance with such amendments."—*Manchester Guardian*.

PUBLIC WORKS AND BUILDINGS.—The estimated items of expenditure in respect of public works and buildings for the year ending on March 31, 1903, amount to a total of 2,254,602*l*. The estimated net increase (84,387*l*.) includes the following items: Public buildings in Great Britain, 33,000*l*.; revenue buildings, 26,500*l*.; harbours under the Board of Trade, 13,583*l*.; public buildings and works in Ireland, 19,495*l*.; and railways in Ireland, 12,324*l*. For special works at Windsor Castle and Buckingham Palace there is a charge estimated at 10 000*l*., and sums of 6,000*l*. and 1,500*l*. are respectively allotted to the maintenance and repairs of Windsor Castle, and the new works at Buckingham Palace. For the Houses of Parliament buildings the estimate amounts to 43,500*l*., showing a net increase of 5,500*l*.; a sum of 116,200*l*. is needed for the Royal parks and pleasure gardens, and of the net increase (4,700*l*.) under that head, 3,864*l*. relates to new works, alterations, and additions. The estimate for Art and Science buildings in Great Britain is 43,300*l*., the net increase being 9,300*l*. Other requirements stand at 371,000*l*. for revenue buildings, 413,700*l*. for public buildings in Great Britain, 19,061*l* for harbours under the Board of Trade, and 222,172*l*. and 125 802*l*. for public works and buildings and railways respectively in Ireland. The estimates for the Royal palaces and Marlborough House, as for ordinary expenditure, amount to 72,800*l*., showing a net decrease of 31,800*l*, after allowance is made for an increase of 1,604*l*. for maintenance and repairs of the Royal palaces, and of 2,500*l*. for similar expenses at Marlborough House; for the Geological Museum, Jermyn-street, 3,350*l*. for its enlargement; and for the Edinburgh Museum, 3,350*l*. for the completion of the installation of electrical light. The principal building works now in progress in London include the new Savings Bank in West Kensington, the Admiralty, and War Office, Whitehall, and the block of offices on the Parliament and Great George-street sites, Westminster.

NEW CLOCK, KENSINGTON.—We are given to understand that the Government intend to erect a large illuminated turret clock at the Savings Bank, Kensington, for the use of the public, and that Messrs. Wm. Potts & Sons, of Leeds and Newcastle-on-Tyne, have the work in a forward state, and it will be erected at an early date.

SCREENS, UNITARIAN CHURCH, ROCHDALE.—As a memorial of Queen Victoria, there has just been presented to the Rochdale Unitarian Church two carved screens to form a new baptistry. Messrs. Harry Hems & Sons, Exeter, have carved the screens. The screens, which are carved out of English-grown oak, form the new baptistry (at the east end of the south aisle), into which has been removed the old font, with its spiral cover of carved oak.

A WHITEWASHING AND PAINTING MACHINE.—Messrs. Wallach Bros. have sent us an illustration and description of their "Star" whitewashing, cold water painting, and calcimining machine. By this machine, which is a hand pump with a flexible tube and rose connected with it, the whitewash or paint is pumped over the surface to be covered. They claim that the expense of whitewashing is reduced 25 per cent. by the use of this machine, and that cracks and crevices can be filled up more completely than by hand. The barrel of the pump is made of brass, and will not corrode. As far as we can judge by illustrations and description, we see reason to think the method quite worth attention where there are large surfaces to be treated with whitewash or plain colour.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—At a meeting of the Devon and Exeter Architectural Society, held at Exeter on Friday last week, a paper was read by Mr. A. T. Parker, of Plymouth, on "Building By-laws," followed by a discussion.

HOUSE CONSTRUCTION AND SANITATION.—The first of a series of four lectures on house sanitation was delivered on the 26th ult. in the physiology classroom of the Queen's College, Belfast, by Professor W. H. Thompson, M.D., F.R.C.S., on "The Situation and Principles of House Construction." In house construction the first thing naturally was the selection of a site. The essential points to be looked for in the choice of a site for building upon were as follows: (1) A moderately elevated situation, with a slope in one direction at least, and sheltered from the north and east, but not shut in by hills at too close a range; (2) a porous soil, with a subsoil sufficiently permeable to secure thorough drainage away of the surface water which fell; (3) a situation in which the ground water was not nearer the surface than 8 ft., and not subject to great fluctuations; (4) a situation where the soil and subsoil were clean, and not fouled by either sewage or refuse; (5) a place which would allow of facilities for a good water supply. Turning to the question of house construction, he said the great problem was undoubtedly the satisfactory housing of the artisan and poorer classes of town dwellers. Having alluded to the evil effects of overcrowding and the proper methods to be adopted with regard to the formation of streets and sewerage, the lecturer went on to deal with the principles of the construction of individual houses. The primary objects to be aimed at were to secure the health and comfort of the inmates. In the proper construction of houses the foundation should consist of a solid platform of stone or concrete, deep enough to give firmness and stability to the building. This should be at least three or four times as broad as the walls. The bases of the walls should be expanded into footings of about twice the width of the wall itself. If there were a basement story, the earth should be cleared away all round the house, so that none directly abutted against the wall, or if any such were impossible, a device recommended by the Local Government Board might be employed. This consisted in making the wall hollow up to a point above the ground level. A damp-proof course should be inserted in the wall a few inches above the level also; that was formed of a layer of impervious material, such as slates, &c., and embedded in cement. In the case of underground stories the damp course should be beneath the level of the lowest floor, and if a hollow wall were adopted instead of an area two such courses should be laid, one at the bottom of the hollow and the other at the top, and therefore above the ground level. Taking it all round, brick was the best material with which to construct walls.

LEGAL.

ACTION BY A BUILDER FOR RESCISSION OF CONTRACT.

THE case of Baker *v.* Moss came before Mr. Justice Joyce, in the Chancery Division last week. It was an action by the plaintiff, a builder, against the defendant for rescission of a contract to purchase 2 acres of land at Shepherd's Bush, on the ground that he had entered into the contract in the belief that certain statements and representations contained in the particulars of sale were true, which was not the fact.

Mr. Hughes, K.C., and Mr. Coote appeared for the plaintiff; and Mr. Younger, K.C., and Mr. Buckmaster for the defendant.

It appeared that the property in question was purchased by the defendant in 1897, and on March 21, 1901, he put it up for sale by auction, the particulars of sale containing the following:—"The capital freehold building site situate about fifteen minutes from the tube station, and in the midst of a capital letting class of property. . . . Ripe for immediate development." The plaintiff attended the sale, and became the purchaser of this property at a price of 1,500*l*., paying the usual deposit. He afterwards found out that the land in question had been excavated some years before to a depth varying between 7 ft. to 20 ft., the gravel and sand being taken out, the excavations having been filled up with road scrapings, dust, refuse, and other rubbish. The plaintiff's case was that in consequence of this the by-laws of the London County Council prohibited him building on the land, except under certain conditions. It seemed that the excavation took place between the years 1886 and 1890, and that a large pond was thereby found on the land. In 1892 the water became very offensive, and the Medical Officer of Health for the district, who was called in to report on the matter, reported that it would be dangerous in the interest of the public health to build on the site. After a time the water was got rid of and the excavations filled in, the land now being covered with grass. The plaintiff alleged that he was unaware of the character of the land, and that he had been induced by the particulars of the property to believe that the site was available for building, the purpose for which he bought it.

The defendant's case was that the land was correctly described in the particulars of sale; that the plaintiff had full knowledge of all material facts relating to the land before agreeing to buy the same; and that if the soil were excavated and proper foundations laid, the land could be used for building without contravening the by-laws of the County Council.

At the conclusion of the arguments of counsel, Mr. Justice Joyce, in giving judgment, held that there had been a serious misdescription of the property in an essential particular. The land was offered for sale as a "capital freehold building site ripe for immediate development." It, however, turned out that the land could not be used for building without a most extraordinary expenditure He found, as a fact, that the plaintiff did rely upon the misrepresentation, and was induced by it to buy the property. He accordingly gave judgment for the plaintiff, with costs.

BUILDING DISPUTE AT EALING.

THE case of Wright *v.* Bury came before Mr. Justice Byrne in the Chancery Division, on the 28th ult., on a motion by the plaintiff for an interim injunction to restrain the defendants erecting on two plots of land belonging to them in the Regina-road, Ealing, buildings intended to be used as homes for aged poor people, in alleged violation of the building scheme of the St. Kilda Estate, under which these particular plots of land were said to have been appropriated for the erection of private residences only.

Mr. Mulligan, K.C., and Mr. Underhill appeared in support of the motion; and Mr. Levett, K.C., and Mr. O. Leigh Clare for the defendants.

It appeared that in March, 1899, the St. Kilda Estate, a building estate at Ealing, was put up for sale, being described in the particulars as "consisting of 188 large choice plots for the erection of private residences." There was also attached to the particulars a condition that no building of any kind other than a detached or semi-detached house, with appropriate offices and outbuildings appurtenant thereto, should be erected on any plot. The defendants, three days before this sale, purchased two of the plots, and in the conveyance the defendants covenanted with the vendor not to erect any buildings of any kind on the lots so purchased other than a detached or semi-detached house in the terms of the before-mentioned condition. The plaintiff afterwards purchased, under similar conditions of sale, four of these lots, which were situated opposite to those purchased by the defendants, on which he built four private dwelling houses. The defendants did not build on their plots until September, 1900, when they put up a notice stating their intention to build a home for poor people, and asking for subscriptions. The plaintiff, on protesting against this, was informed that the defendants' proposed building would only be a private house. In November, 1901, the defendants commenced to build, on behalf of the Ealing Cottage Homes for the Aged Poor, a set of self-contained living-rooms for the accommodation for about fourteen families, with a common entrance, kitchen, sink, and offices, but otherwise independent of each other. The plaintiff's case was that such an erection by the defendants would diminish the value of his property by 30 per cent., and he brought the present action. Hence the present application for an interim injunction. The defendants' case was that they were building ordinary eight-roomed houses which could be used, if required, as private residences.

At the conclusion of the arguments, his lordship, in giving judgment, said what the defendants were building and proposed to build was an ordinary eight-roomed house on each plot, and without any knowledge of the purpose for which these erections were to be used, he should say that they answered in every respect the description of a private dwelling house. It looked as though the architect had purposely designed the buildings in this way in case their erection should be stopped and so that they might, if necessary, be at any time used as private dwelling houses. What the plaintiff really complained of was the proposed use of these buildings, but that was not the relief asked for by the notice of motion. He thought that no case for an *interim* injunction had been made out, and in his opinion the motion failed.

The motion was accordingly dismissed.

ACTION BY A BUILDING OWNER AT FOLKESTONE.

MR. JUSTICE BYRNE, in the Chancery Division, on the 4th inst., had before him the case of Lord Radnor *v.* the Gordon Hotels, Ltd., an action by the plaintiff against the defendants, the lessees of the Hôtel Métropole at Folkestone, to restrain the erection by the defendants of barriers across the road running on the western side of the hotel from the Leas to the Sandgate-road, whereby the plaintiff, his lessees, and tenants of the land adjoining, were obstructed in the free use for all purposes of the existing roadway. The plaintiff also complained of a nuisance caused by the defendants in allowing unconsumed smoke from the chimney-shaft of the hotel caused by furnaces and appliances used for the heating and electric lighting of the hotel. The plaintiff also further complained that the defendants, in breach of a covenant in their lease, had kept no boxes of flowers or evergreens, or any work of an ornamental character, on the flat roof of the engine-house. The main dispute in the case was as to the barriers, which the plaintiff said were a violation of the whole building scheme of his estate.

At the conclusion of the arguments his lordship allowed the plaintiff 40*s*. damages on the claim for nuisance caused by the smoke, nominal damages being only asked for under this head. With regard to the second head of claim, as to the alleged breach of the covenant to place boxes of flowers or evergreens, &c., on the roof of the engine-house, his lordship thought that the defendants had, before action brought, complied with the terms of the covenant, and refused to award the plaintiff any damages in respect of this. On the other part of the claim, as to the barriers which the defendants had erected

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his lordship was of opinion that there was nothing in the lease to prevent the de endants from putting up the barriers they had erected, and the plaintiff's claim to restrain them accordingly failed.

Judgment accordingly.

Mr. Levett, K.C., and Mr. Davenport appeared for the plaintiff; and Mr. Warmington, K.C., and Mr. Kirby for the defendants.

ANCIENT LIGHT DISPUTE—SMALL DAMAGES.

MR. JUSTICE JOYCE, in the Chancery Division on the 4th inst., delivered judgment in the case of Avery and Wolmerson *v.* Lewis, briefly reported in last week's issue of the *Builder*.

This was a light and air case having reference to premises in New Cross-road, S.E., the plaintiffs alleging that the new building, which the defendants had erected, materially diminished the light to two windows at the rear of their premises, such lights being ancient. They claimed a mandatory injunction and damages. The defendant denied that the plaintiffs' light had been materially or substantially interfered with.

The expert witnesses called on behalf of the plaintiffs were Messrs. J. Webster, Forbes, and Downes; and on behalf of the defendants Messrs. E. A. Grüning, Sidney Goss, Bruce Dawson, H. W. Page, and W. Wall.

The facts of the case sufficiently appear from the judgment.

His Lordship, in giving judgment, said this was an action in respect of the obstruction, or the alleged obstruction, of the access of light to two windows in the plaintiffs' offices, windows which were 4 ft. 3 in. in height and 3 ft. in width, and the sill of which was 7 ft. 2 in. from the ground. The windows looked due east, and at right angles to the wall in which the windows were placed. A little to the south was a high building which, no doubt, very much obstructed the light to these windows. There was, however, no lateral obstruction, but practically when you came to examine the plans and sections he thought the access of light to those windows was, except by the building to the south, practically unobstructed. The obstruction the plaintiffs complained of was in the shape of a building only 5 ft. 6 in. away from the wall in which the windows in question were placed. The building containing these windows was leased in July, 1887, for a term of sixty years, of which there were about forty-four years still to run at a rent of 60*l*. a year. In 1892 this lease was assigned to the plaintiffs a firm of solicitors, who used the room in which the lights mentioned were, as the private room of the partners, or one of them. The defendants proposed building in 1901, and the plaintiffs were informed that the building was to be erected in such a manner as would not interfere with their lights. On October 24 the building was commenced, and on November 6 the plaintiffs, as they said, knowing nothing about it before, discovered the wall of which they complained being built up 5½ ft. away from the wall in which their windows were. That was on November 6, and at 2.45 p.m. on that day this wall, which was parallel to the wall in which the plaintiffs' windows were placed, was up to the level of the sill of the windows. In the course of the afternoon the building proceeded, and about 5 o'clock on that day the wall was up to 3 ft. 8 in. above the level of the sill of the plaintiffs' windows, as shown on the plans. His lordship, having explained the defendants' plans and sections, said he had not the slightest doubt in his own mind that the defendants' building as originally intended to be erected would have been a very serious obstruction to the access of light to these two windows, and he thought the wall as it had been raised was a material obstruction to the access of light to the same windows. In that state of things, the defendants gave an undertaking that nothing further should be done for some time and without forty-eight hours' notice, but on November 13 the architects of the defendant wrote to the architects of the plaintiffs a letter upon which stress had been placed. That letter said that Mr. Lewis, the defendant, had instructed them to inform the plaintiffs' architects that though he did not admit that the building as originally intended would damage the plaintiffs' property, he hoped to meet their wishes to keep the wall down as far as possible to within 7 ft. above the existing floor. The letter went on to state that they proposed to start on this part of the building on the Friday. A sketch plan not drawn to scale, with these suggestions was given. His Lordship thought the defendant's proposed building would have been an obstruction as to the access of light to the plaintiffs' windows. This letter from the defendant's architects to the plaintiffs' architects did not ask for any reply. It was simply a notice by the defendant's architects of what they intended to do. On the next day the plaintiffs' architects wrote in reply that they had seen their clients, and they were not prepared to accede to the proposition contained in their letter, and they would, therefore, be compelled to have recourse to the courts to enforce their rights. His Lordship could see nothing improper in that letter. But there was a subsequent letter which, to his Lordship's mind, was a very important one—a letter of November 15 from the defendant himself to the plaintiffs. He said that his offer through his architects, which was written to avoid litigation, having been declined, he withdrew it. He said he did not intend to build the wall opposite the plaintiffs any higher, and he left them to take any steps they liked. In his Lordship's opinion the first sentence as to the offer was a misstatement, and was written under a misapprehension. There was no offer in the letter written by the defendants' architects to the plaintiffs' architects, but merely notice of what they intended to do. On November 16 the writ in the action was istued. In his Lordship's opinion at that time a serious and real obstruction of the access of light to these windows was threatened, and this action was perfectly justified. Then notice of motion was given of an interim injunction, and it came on at the end of November, when an order was made, upon an undertaking given by the defendants that the action was to be set down for trial without pleadings, the defendants undertaking not to obstruct a greater angle of light measured from the centre of the windows of the plaintiffs' offices than was obstructed by the defendants' wall as it then stood. That undertaking had been complied with. On December 3 notice of trial was given, and his Lordship was of opinion that notice of trial was properly given. He might observe that there had never been any application to pay the plaintiffs' costs. Afterwards the defendants took down the wall as it stood at the time of the commencement of the action, and they completed the building as shown on the plan. In his Lordship's opinion there was no question of law to be decided in this case at all—it was merely a question of fact. The only real question was whether the obstruction was sufficient to entitle the plantiffs to relief. As the law stood at present, it was very difficult to say whether the obstruction created by the defendants' building was "sufficient," "material," and "substantial," so as to entitle the plaintiffs to relief. Sometimes it had been laid down that it must be a sensible obstruction, but the difficulty was they had no definition of what was meant by "sensible," "substantial," and "material." No rule had been laid down which enabled him to say on which side of the line the obstruction might be. The court had to do the best it could to lay down a line of what was "material" and what was not. He must say that looking carefully at the plans and sections he should have expected the witnesses to say that there was material obstruction. Of the witnesses called on behalf of the plaintiffs, the plaintiffs themselves were really the best witnesses to speak to the obstruction, they being constantly in the office. He saw no reason to disbelieve the plaintiff's evidence, which said that the light had been materially diminished and that the room was not so convenient for business as it was before the defendants' building was erected. The defendants' witnesses admitted there was a difference but said it was merely immaterial or theoretical. Mr. Webster, whom one saw frequently on these cases, said that the light was substantially diminished and he saw no reason to disbelieve his evidence. Dealing with the defendants' expert witnesses his lordship, referring to Mr. Grüning's evidence, said that he had advanced views which it was impossible for him to accept. He said that there was no material obstruction so long as there was sufficient light left for ordinary purposes. Mr. Bruce Dawson said there was no substantial obstruction, though there was theoretical obstruction. The defendant's witnesses generally did not deny there was obstruction, but they strove to minimise the extent of its importance. Well, it was on all this evidence that he had to come to a conclusion, and the conclusion he had come to was that there was a sensible and material obstruction to these two windows, especially the northern one—not very great, but still sufficient to maintain the action. The defendant appeared to him to have gone a little too high. Ought he, in these circumstances, to order the defendunt to pull down? Although he thought there was sensible or material obstruction, still it was a small act, seeing the circumstances under which the building was erected, and kept within the undertaking of the defendant when the order was made on November 29. In these circumstances he had come to the conclusion that he ought not to make a mandatory order. Ought he to send the case to a Master for an inquiry as to damages? He thought not, because if he sent it to a Master the costs of that inquiry would exceed the sum he thought would cover the damage to the plaintiffs. The order he made was that the defendant should pay the costs of the action, and he awarded the plaintiffs 10*l*. damages.

Judgment accordingly.

Mr. Hughes, K.C., and Mr. Humphreys were counsel for the plaintiffs; and Mr. Younger, K.C., and Mr. Jolly for the defendant.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

ERRATUM.—In No. 19,061, p. 222 *ante*, "up" should have been "tip."

19,198. — LIFTING-TACKLE: *B. Wesselmann.* — Enlargements at the lower ends of the strap of a screw lifting-tackle contain fixed, and either hollo or solid, rods which, together with cross-bars, constitute a framing for the worm-shaft, the rods are secured by screwing, or with cottars, or by causing their middle portions to fit into the enlargements, the straps being cut from a rolled bar of the section required. In another shape the frame is rendered detachable by the affixing of the enlargements to the straps with screws or by similar means, or the enlargements are fashioned upon separated pieces welded on to the strap the worm-wheel shaft being taken by the thickened welds; an extension of one of the cross-bars provides a guard for the chain-wheel.

19,206. — IMPROVEMENTS IN LIFTING-JACKS: *W. H. Brenton.*—A lever, which should have a U-section, is pivoted in the head of an adjustable standard and carries a pawl which, under normal conditions, a spring retains in engagement with teeth in the head of the standard, close to the handle of the lever is another lever for disengaging the pawl which is joined to it by a rod.

19,220.—A SUPPORT FOR ELECTRICAL LAMPS: *H. Hirst and J. H. Collings.*—The case of a coupling for pendants and other fittings consists of two halves, of which one is fashioned with a projecting rim or lip, and the other with a screw-thread or projecting pins that will engage with a connecting-ring having bayonet slots or being correspondingly screw-threaded; within the casing are placed insulators that are pierced for the connecting wires, and are fitted with contact-plates and spring-plungers, the relative turning of the parts is prevented by means of pins and slots in the insulators and the two halves of the casing.

19,264.—TREATMENT OF SEWAGE AND FOUL WATERS: *D. Cameron, F. J. Commin, and A. J. Martin.*—In order to intercept road grit the inventors furnish hinged guide boards for the grit-chambers, so that the floating solids in the stream of sewage shall be confined to a narrowed passage, which should not be wider than the sewer. Pierced or slotted wells or shafts, fitted with valves, serve to draw liquid from the grit-chambers before the removal of their contents, and fixed boards or floats may be employed instead of the hinged boards. For supplying sewage to a filter or bacterial bed are furnished castings or funnels, mounted upon shafts carried upwards from the floor of the bed, and connected to one another with supply-channels that can be drained by means of a pipe set in communication with a container wherein heavy matters will be deposited.

19,268.—FLUSHING APPARATUS: *F. Wangelin.*—A rocking arm, weighted at each of its ends, controls the inlet-cock; a siphon that communicates with the discharge-pipe is set within the compartment in which one of the weights will operate, and it will be started, normally, by the current of the flush, so as to empty the compartment, whereupon the weight will descend to open the inlet. The siphon, however, will not be started, nor will the inlet become opened, in the event of the cistern being emptied by a slow leakage. A float working within the compartment may, upon occasion, be fitted on to the rocking-arm.

19,320.—A PREPARATION FOR BRAZING PURPOSES: *L. Alpe.*—Instead of borax, a composition is prepared of boracic acid—85 parts, chloride of barium—5 parts, cryolite—5 parts, and graphite—5 parts.

19,327.—SCREW-UNIONS FOR PIPES: *G. Chisholm.*—Metallic pipe unions are stamped, cut, and pressed out of sheet-metal. The end of a round blank that has been cupped is perforated, and the resultant tube is pressed, with certain specified tools, so as to form a rounded shoulder upon it; then, having been placed in another die, it is pressed with a top-tool into the necessary shape, and a screw-thread is cut on the shoulder, the male portion of the union being similarly prepared, a screw collar is fashioned out of a perforated cup, and shapened—the two parts thus constitute a union ready for use.

19,371.—AN ELECTRICAL SWITCH: *E. Norris.*—Electro-magnetical means of opening the armature circuit in cases of over-load and under-load are adapted for the starting-switch of a shunt-wound motor. A dipper mounted upon a pivoted arm dips into some semi-conducting liquid within a box, a weight which an electro-magnet keeps down tends to turn the arm. For under-load only a single winding is fitted for the magnet, but for over-load as well as under-load a compound winding is employed.

19,392.—A CEMENT: *K. Müller.*—For use in making fine castings the inventor devises an admixture of calcium, sulphate, and a saturated solution of magnesium sulphate compounded with burned magnesia.

19,397.—A METHOD OF FASTENING CASEMENTS, WINDOWS, &C.: *E. H. Stodart.*—To the inner sash of a window is secured a socket that provides a bearing for a bolt to be drawn back with a spring, there are projections at one end of the bolt and a knob on its other end, the bolt will pass through an opening in a socket upon the other sash, and—for fastening purposes—it is forced through the opening, turned through 90 deg., and then drawn back by means of the spring in order that it may engage with a recess fashioned in the socket on the latter sash.

19,420.—SPIGOT-AND-SOCKET JOINTS FOR CLOSET PIPES: *N. E. Cooke.*—The basin of the closet is

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socketed in the trap in the ordinary manner, but in order that it shall not be tilted forwards a projection that will engage with a catch on the trap is fashioned upon the basin, the parts being locked with a wooden wedge. A ground conical joint may also be used, and the trap may be flanged and bolted on to the basin, or, otherwise, the projection may constitute a flange around the basin.

19,440.—MECHANISM FOR FLOAT VALVES: *A. Cruickshanks and A. Scrivenor.*—In order that the working level may be adjusted whilst a full range for the opening and closing movements is obtained, a rotatory valve, or a flat or tubular slide, is set to work in or upon an adjustable sleeve or port-face. The specification includes several forms of the invention, which is available for controlling the water level in, and the feed of water to, tanks, vats, boilers, and similar vessels.

19,484.—AN EXPANSION JOINT FOR PIPES: *C. Wills.*—An expansion and gastight joint, which is described as being particularly applicable to pedestal closets, has an elastic packing-ring that lies above two other rings of asbestos, or some such material, by which means it is not liable to the action of sewage or of sewage gas. Studs or bolts secure the gland to the socket.

19,485.—A METHOD OF VENTILATION: *A. Meyer.*—In the case of certain confined spaces—as, for instance, a room containing a set of fermenting vats—the air is drawn by exhaustion through shafts fitted with filters and non-return valves, and thence, after having been passed over either warming or cooling pipes, is conveyed through perforated and movable partitions into the room. The air is next conveyed through funnel-shaped mouths to an exhaust vessel with which the vats are in communication.

19,515.—TREATMENT OF WOOD: *G. F. Lebioda.*—A solution for preserving wood and rendering it fireproof consists of borax—10 parts, sulphate of ammonia—40 parts, and boric acid—about 6 parts. The wood may be steeped in, or sprinkled or coated with the preparation.

19,525.—AN APPLIANCE FOR USE IN GEODETICAL MEASUREMENT: *F. Deinert.*—The inventor furnishes means of a ready correction of variations in the length of a steel measuring-tape arising from changes of the temperature. After the tape has been laid along the ground (and, by preference, clamped to a rail), one end and a corresponding screw-adjusted carrying-block are joined together with a spring balance, which, at a chosen degree of temperature, imparts a certain amount of normal tension to the tape; but when the length of the tape becomes altered through a change of the temperature, the screw of the carrying block will move the block until the balance indicates twice the amount of displacement from normal to that which has been caused by the variation. The reading of deviation from the normal tension is signalled to the operators along a second wire.

19,548.—BRICK-MOULDING MACHINERY: *F. Johnson.*—For facility of repair in the case of a combined rotatory table machine and cam, or of a similar press, the inventor makes the pug-mill shaft in two flanged parts, to be bolted together, and also makes the barrel in two or more parts. Due provision is made for rotating the mould-table intermittently, and levers join opposite plungers to one another whereby one will be lifted to expel the brick as the other is being lowered by the clay impelled through the pug-mill. A cam-worked lever removes the brick from the table to the press, where the brick is compressed between plungers of which the lengths can be adjusted and which are joined with vertical rods.

19,566.—SAFETY-APPARATUS FOR LIFTS: *T. McInroy.*—The apparatus is intended to effect an automatical closing of a well-door as the cage goes away, and is adapted to vertically-closing and vertically-hinged doors, as well as to horizontally-collapsible doors. A door after the first-named kind is held opened with a catch, upon one end of a lever, which will be disengaged by the other and curved end of the lever as it impinges against one or the other of pins affixed to the cage, otherwise it is contrived that the engaging faces of either the catch or the door shall be so inclined as to have a tendency to become separated whilst the pressure of a plate upon the cage, that acts by means of a spring, keeps the engagement in action; two weights serve to balance, in part, the weight of the door, and one of them comes into play when the door is almost shut. For a vertically-hinged door the lever is cranked. In the case of a collapsible door the catch will engage with the weights, and not with the door, to the free end whereof, or to a lazy-tongs extension, the weights are joined.

19,575.—A CONTRIVANCE FOR USE WITH HOISTS AND LIFTS: *F. G. Childs.*—Prongs upon a bar are secured to endless ropes around pulleys at the top and bottom of the well, so as to constitute a series of swinging platforms. Each platform has rollers that engage with guides, and there are bars that can be turned into the well, upon which articles can be laid.

19,584.—IMPROVEMENTS IN PLIERS: *R. Hollweg.*—Grooved linings, either fixed or removable, are provided for the jaws of the pliers, and are made of brass, copper, lead, wood, &c., as may be most suitable for the work.

19,597.—A COMPOSITE MATERIAL FOR BUILDERS' USE: *E. Bushman.*—The compound is made up of pulverised silica and flint, oxide of zinc, a solution of borax, caustic potash, caustic soda, aluminium, asbestos, water, and a quantity of silicate of soda enough to form it into a thick paste. The material is specified as being adapted for fireproof and waterproof covering for ceilings and walls, for flooring and paving purposes, for baths, sinks, and so on.

19,608.—A COMPOSITE PLASTER FOR SLABS, SHEETS, &C: *C. W. T. Eustance and F. D. Colley.*—Plates for general plaster-work, including walls, partitions, ceilings, and so on, are moulded under pressure from an admixture of plaster of Paris, twenty-two parts; water, containing 5 per cent. of common salt, forty-four parts; hair, four parts; oak sawdust, fifteen parts; and shavings or horn parings, fifteen parts. The sheets may be secured with cement, or be screwed or nailed on to woodwork, and when placed can be bevelled and finished with sandpaper. Their surfaces can be papered, painted, or distempered, and the joints be filled with plaster. They are also available for temporary structures, in the place of iron, wood, or brickwork.

19,639.—A WINCH FOR USE WITH DREDGERS: *F. Lobnitz.*—A handle which is cranked on to a ring upon the boss of the drum enables one to move the chain-drum, which runs loosely upon the driving-shaft to either the right or the left. When the drum is moved towards the left a friction-disc, or a positive clutch, upon the drum will engage with a fixed half-ring; when it is moved towards the right the drum will become coupled to the shaft through the engagement of clutches on the drum with corresponding stationary clutches.

19,646.—KILNS FOR EARTHENWARE GOODS: *J. R. W. Woodward and N. Collier.*—Concentrical chambers are disposed under the removable perforated floor, and similarly placed flues or grooves which lead therefrom have intersecting radial flues which are conducted to the main flue, an air-space around the main flue opens into passages which, with others over them, convey heated air to the fire-holes; the goods can be cooled by shutting the chimney-damper and opening a man-hole for cold air which will flow through the kiln in a direction contrary to that followed by the heating-gases and thence through an aperture in the roof.

MEETINGS.

FRIDAY, MARCH 7.

Architectural Association.—Mr. J. Miller on "The Glasgow Exhibition." 7.30 p.m.

Birmingham Architectural Association. — Mr. F. E. P. Edwards on "Elme's Work in Liverpool."

Sanitary Institute (Lectures for Sanitary Officers).—Dr. H. R. Kenwood on "Elementary Statistics." 7 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. W. Beaton on "Glasgow International Exhibition, 1901." 8 p.m.

SATURDAY, MARCH 8.

Royal Institution. — Rt. Hon. Lord Rayleigh on "Some Electrical Developments" IV. 3 p.m.

British Institute of Certified Carpenters.—Visit to Messrs. F. W. Reynolds, engineers, Blackfriars-road. 3 p.m.

Hartley College Engineering Society (Southampton).—Mr. R. H. Dyer on "Domestic Sanitation." 7 p.m.

Edinburgh Architectural Association. — Visit to Edinburgh and Leith Corporations new gasworks at Granton.

Dundee Institute of Architecture.—Mr. D. L. Allan on "Brittany." 7 p.m.

Architectural Association.—Third Spring Visit—Messrs. Derry & Toms' new premises, rear of 111-119, Kensington High-street, by permission of the architect, Mr. F. E. Williams. 2.30 p.m.

MONDAY, MARCH 10.

Surveyors Institution.—Paper by Mr. C. H. Bedells, entitled "Notes on the Insurance of Buildings against Fire." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor R. Elsey Smith on "Building Materials." 7 p.m.

Society of Arts (Cantor Lectures).—Mr. J. D. Geddes, F.R.P.S. on "Photography Applied to Illustration and Printing."—II. 8 p.m.

Clerks of Works Association.—Monthly meeting, Carpenters' Hall. 7.30 p.m.

Bristol Society of Architects.—Mr. H. Chatfeild Clarke on "Ancient Lights." 8 p.m.

TUESDAY, MARCH 11.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Wright Clarke on "Details of Plumbers' Work." 7 p.m.

Institution of Civil Engineers.—Paper to be further discussed: "Electrical Traction on Railways," by Messrs. W. M. Mordey and Bernard M. Jenkin. 8 p.m.

Institution of Electrical Engineers (Glasgow Section).—"Note on a New Electro-Magnet for Use in Magneto-Optic Work," by Professor A. Gray. 8 p.m.

WEDNESDAY, MARCH 12.

Architects' Benevolent Society.—Annual General Meeting of the subscribers and donors, in the rooms of the Royal Institute of British Architects. The President, Mr. William Emerson, will take the chair at 5 o'clock.

Edinburgh Architectural Association.—Paper by Professor Baldwin Brown, entitled "Some Thoughts on the Dome as an Architectural Form." 8 p.m.

Northern Architectural Association.—Annual meeting. 7.30 p.m.

THURSDAY, MARCH 13.

Institution of Electrical Engineers.—Adjourned discussion on the following papers:—"Electric Shock, and Legislation thereon," by Major-General C. E. Webber; "Electric Shocks," by Mr. F. B. Aspinall; "Electric Shocks at 500 volts," by Mr. A. P. Trotter. 8 p.m.

Carpenters' Hall, London Wall (Free Lectures on Matters connected with Building).—Professor T. Roger Smith on "Exeter Cathedral." 8 p.m.

Institute of Sanitary Engineers, Limited. — The Examination and Literary Committee, 3.45 p.m. General Purposes and Finance Committee, 4 p.m. Extraordinary general meeting, 5 p.m. Election Committee, 5.30 p.m. Sessional meeting, 7 p.m.

Leeds and Yorkshire Architectural Society. — Mr. Ernest Newton on "House Building." 6.30 p.m.

Manchester Society of Architects. — Discussion on Students' drawings.

Society for the Encouragement of the Fine Arts.—Mr. E. O. Sachs on "Artistic Electric Illumination," with demonstrations. 8 p.m.

FRIDAY, MARCH 14.

Architectural Association Discussion Section.—Mr. H. C. Lander on "Co-operative Homes." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor R. Elsey Smith on "Sanitary Building Construction and Planning: Soil and Local Physical Conditions." 7 p.m.

Institution of Junior Engineers. (Westminster Palace Hotel).—Paper on "The Uses of Engineering Models," by Mr. Percival Marshall, Chairman. 8 p.m.

Sheffield Society of Architects and Surveyors.—Paper by Mr. T. G. Jackson, R.A.

Institution of Civil Engineers.—(Students' meeting). —Mr. H. J. Deane, B.E., on "The Use of Long Steel Wires in Surveying." 8 p.m.

SATURDAY, MARCH 15.

Institution of Junior Engineers.—Conversazione at the Westminster Palace Hotel. Reception at 7 p.m. by the President (Sir John Jackson, F.R.S.E.) and Lady Jackson, the Chairman and Mrs. Marshall.

Royal Institution.—Right Hon. Lord Rayleigh, M.A., on "Some Electrical Developments." V. 3 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers). — Inspection at the Sewage Works, Sutton, Surrey. 3 p.m.

Hartley College Engineering Society, Southampton.—Mr. S. W. Smith on "The Microstructure of Steel." 7 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 19.—By G. LOVEITT & SONS (at Brinklow).

Brinklow, Warwick.—Fourteen freehold cottages, w.r. 78*l.* 13s.	£623
East View House, f., p.	400

February 21—By WILLSON & PHILLIPS (at Great Wakering).

Great Wakering, Essex.—New Town, Howard's Villa, f., p.	990
Great Wakering-st., freehold house and shop and seven cottages, y.r. 53*l.* 1s.	1,000
2, Olive Villas, f., y.r. 15*l.* 12s.	260
2, Alpha Villas, f., q.r. 15*l.* 12s.	270
Shoeburyness, Essex.—Grove-rd., Salvation Army hall and cottage adjoining, f., y.r. 36*l.*	475

February 24.—By GEO. BRINSLEY & SON.

Chelsea.—33 and 35, Caversham-st., u.t. 40 yrs., g.r. 4*l.* 10s., y.r. 60*l.*	730

By GEO. HEAD & Co.

Dormans Park, Surrey.—The House by the Lake and 3 a. 2 r. 21 p., f., p.	2,550
Bath, Somerset.—Sion Hill, a perpetual yearly charge of 34*l.*	800

By MAY & PHILPOT.

Brixton.—86, Tulse Hill, and ½ a., u.t. 48 yrs., g.r. 22*l.*, p.	900
145, Tulse Hill, u.t. 45½ yrs., g.r. 30*l.*, p.	1,100
Streatham.—11, Lewin-rd., u.t. 85 yrs., g.r. 10*l.* 10s., p.	500

By THOMAS, PEVER, & MILES.

Dunkerton, Somerset.—The Cross Ways p.-h., and 10 a. 0 r. 4 p., f., y.r. 50*l.*	1,500

By G. A. WILKINSON & SON.

City of London.—Philpot-lane, f.g.r. 300*l.*, reversion in 68½ yrs.	10,250
35, Basinghall-st., building site, area 1,080 ft., f.	5,600
Bow.—190, Bow-rd. (S), c., y.r. 75*l.*	1,400
Albert-ter., a plot of land, c., q.r. 15*l.*	330

February 25.—By JOHN BOTT & SONS.

Herne Hill.—193, Norwood-rd., u.t. 69 yrs., g.r. 6*l.* 6s., p.	405

By COCKETT & HENDERSON.

Wanstead.—Sylvan-rd., Woodlands, f., p.	1,000

By C. W. DAVIES & SON.

Hoxton.—15, Alma-st., u.t. 33 yrs., g.r. 5*l.*, y.r. 38*l.*	335
31, Alma-st. and 1, Nile-st. (S), u.t. 33 yrs., g.r. 7*l.* 15s., y.r. 53*l.* 12s.	420
31, Alma-st., u.t. 33 yrs., g.r. 5*l.* 5s., y.r. 38*l.*	355
43 to 51 (odd) and 63, Alma-st., u.t. 33 yrs., g.r. 31*l.* 5s., y.r. 216*l.*	1,970
Hackney.—5 and 7, Sylvester-rd. (S); also Cock Yard (stabling) f., y.r. 110*l.* 12s.	1,210
1 to 4, Grove-buildings, f., y.r. 128*l.*	1,470
Highbury.—145, Petherton-rd., u.t. 47½ yrs., g.r. 7*l.* 7s., e.r. 70*l.*	650
50, Leigh-rd., u.t. 78 yrs., g.r. 9*l.*, e.r. 55*l.*	540
Harringay.—108, Seymour-rd., u.t. 94 yrs., g.r. 7*l.*, e.r. 42*l.*	480

By DEBENHAM, TEWSON, & Co.

Hampstead.—80, Fitzjohn's-av., area ½ an acre, f., p.	7,500

By FREDK. WARMAN.

Finsbury Park.—35, Woodberry-grove, u.t. 990 yrs., g.r. 16*l.* 5s., e.r. 85*l.*	750
Highbury.—57, Leigh-rd., u.t. 57½ yrs., g.r. 10*l.*, e.r. 65*l.*	615

By FULLER, HORSEY, SONS, & CASSELL (on premises).

Esher, Surrey.—The Royal Mills (Esher Linoleum Company), area 12 a. 2 r. 38 p., f., p.	5,000

By Messrs. SPELMAN (at Gt. Yarmouth).

Great Yarmouth, Norfolk.—2, King-st. (o), f., p.	3,200
172, King-st. (s), f., y.r. 106*l.*	2,900

By J. HART, BRIDGES, & SONS (at Masons' Hall Tavern).

Southampton.—Melbourne-st, the Mill Tavern b.-h., area 2,150 ft., u.t. 442 yrs., g.r. 7*l.* 10s., with goodwill	1,590

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By G. LOVEITT & SONS (at Coventry)·

Coventry, Warwick.—22 to 25, Cross Cheaping (s). and six tenements in rear, f., y.r. 249*l.* 2s. £4,750
19, Warwick-row, f., p. 590

By J. C. PLATT (at Hammersmith).

Hammersmith.—3, Bridge-av., u.t. 40½ yrs., g.r. 5*l.* 5s., e.r. 48*l.* 510
Kensington.—13 and 14, Porten-rd., u.t. 64 yrs., g.r. 16*l.*, w.r. 93*l.* 12s. 615

February 26.—By BROUETT & TAYLOR.

Weybridge, Surrey.—Windsor Walk, The Haven, u.t. 87 yrs. g.r. 17*l.* 10s., e.r. 80*l.* 700
Bloomsbury.—53, Gloucester-st., f., w.r. 123*l.* 10s. 1,090
Forest Gate.—13 and 15, Khedive-rd., u.t. 82½ yrs., g.r. 11*l.* 4s., e.r. 56*l.* 460

By DREW & SON.

Richmond, Surrey.—10, Larkfield-rd., u.t. 76½ yrs., g.r. 1*l.*, e.r. 50*l.* 515
St. Leonards-on-Sea, Sussex.—Shorndenter., i.g.r. 31*l.*, u.t. 63 yrs., g.r. 8*l.* 12s. 6d. 360
Deptford.—Watson-st., f.g.r. 4*l.*, reversion in 31½ yrs. 133

By DUNCAN & KIMPTON.

Clerkenwell.—56, Granville-sq., u.t. 51½ yrs., g.r. 9*l.*, r. 56*l.* 550

By G. GOULDSMITH, SON, & Co.

Pimlico.—Tachbrook-st., i.g.r.'s 222*l.*, u.t. 32 yrs., g.r. 35*l.*, with reversions from 2½ to 7¾ yrs. (in lots) 3,005
78, Belgrave-rd., u.t. 35¾ yrs., g.r. 10*l.*, p. 910
80 and 82, Belgrave-rd., u.t. 35¾ yrs., g.r. 20*l.*, r. 200*l.* 1,850
35A, Charlwood-st., u.t. 35¾ yrs., g.r. 2*l.*, y.r. 73*l.* 10s. 675
23, Moreton-pl., u.t. 26 yrs., g.r. 8*l.* 10s., y.r. 60*l.* 510
Belgravia.—8, Wilton-st., u.t. 19 yrs., g.r. 15*l.*, y.r. 230*l.* 1,920

By MORGAN, BAINES, & CLARK.

Norwood.—76 and 80, Central Hill, u.t. 50 yrs., g.r. 20*l.*, y.r. 202*l.* 1,600
Bexley Heath.—88, The Broadway, f., y.r. 32*l.*.. 400

By R. TIDEY & SON.

De Beauvoir Town.—19, Ardleigh-rd., u.t. 22 yrs., g.r. 6*l.* 10s., y.r. 40*l.* 300

February 27.—By ANSCOMBE & RINGLAND.

St. John's Wood.—26, Norfolk-rd., u.t. 33 yrs., g.r. 10*l.*, e.r. 65*l.* 460

By FAREBROTHER, ELLIS, & Co.

Woolwich, Kent. — Harrington-rd., Trinity Wharf, area 25,800 ft., f., p. 2,300
Trinity-st., Jackson and Bentley's Wharf, area 7,700 ft., f., p. 900
Trinity-st., f.g.r. 10*l.*, reversion in 46 yrs. 345

By FIELD & SONS.

Southwark.—18 and 20, Southwark-st. (offices, warehouses, &c.), u.t. 41 yrs., g.r. 250*l.*, y.r. 690*l.* 1,100

February 27.—By HAMPTON & SONS.

Ealing.—Richmond-rd., Sunnyside and March Villa, f., y.r. 80*l.* 1,000
16 to 22 (even), Ranelagh-rd.; and 1, 2, and 3, Ranelagh-mews (stabling); also Rose Cottage, f., y.r. 254*l.* 16s. 3,000

By IZARD & IZARD.

Gunnersbury.—18, Silver-cres., u.t. 76½ yrs., g.r. 7*l.*, e.r. 45*l.* 475

By HERRING, SON, & DAW.

Silvertown.—Tate-rd., f.g.r. 52*l.*, reversion in 98 yrs. 1,170
Muir-st., f.g.r. 28*l.*, reversion in 98 yrs. 640

By C. C. & T. MOORE.

Stratford.—46 to 54 (even), Vicarage-l., u.t. 26¼ yrs., g.r. 12*l.* 10s. 6d., w.r. 104*l.* 670
Forest Gate.—Atherton-rd., a freehold building site, area 3,550 ft., p. 185
37 to 43 (odd), Haslemere-rd., u.t. 87½ yrs., g.r. 5*l.* 5s., w.r. 123*l.* 10s. 780
Hackney.—16, Gloucester-rd., u.t. 44 yrs., g.r. 10s., y.r. 45*l.* 585

By NOTT, CARTWRIGHT, & ETCHES.

Notting Hill.—141, 143, and 145, Portobello-rd. (s), u.t. 49 yrs., g.r. 24*l.*, y.r. 130*l.* 1,610

By RAMSAY, WAINWRIGHT, & Co.

Crouch Hill.—87, Shaftesbury-rd., u.t. 73 yrs., g.r. 7*l.* 10s., y.r. 44*l.* 440
Stroud Green.—1, Carlton-rd, u.t. 74½ yrs., g.r. 8*l.* 10s., e.r. 48*l.* 450

By STIMSON & SONS.

Lincoln's Inn Fields.—Gate-st., The Sun p.-h., f.g.r. 100*l.*, reversion in 18½ yrs. 3,450
Forest Gate.—70 to 76 (even), Studley-rd., f., w.r. 104*l.* 1,160
Old Kent-rd.—19 to 25 (odd), Tustin-st., u.t. 9½ yrs, g.r. 18*l.*, w.r. 104*l.* 210
Regent's Park.—137, Albany-st. (S), u.t. 13¾ yrs., g.r. 15*l.*, y.r. 60*l.* 320
165, Albany-st. (S), u.t. 13¾ yrs., g.r. 21*l.*, y.r. 55*l.* 240
Thornton Heath, Surrey.—6 and 8, Farnham-rd., f., y.r. 59*l.* 4s. 580

By FULLER, MOON, & FULLER (at Croydon).

Croydon.—16, Campbell-rd., f., y.r. 40*l.* 710
18, Campbell-rd., f., e.r. 50*l.* 575
29, St. Peter's-rd., f., e.r. 52*l.* 10s. 705

February 28.—By BURTON, Smith, & Co.

Streatham.—80 and 81, Barrow-rd., u.t. 81 yrs., g.r. 10*l.*, y.r. 93*l.* 975

By C. RAWLEY CROSS & Co.

Kensington.—17, Cromwell-gr., u.t. 74½ yrs., g.r. 6*l.*, e.r. 55*l.* 540
Acton.—19, Willcott-rd., u.t. 96 yrs., g.r. 7*l.* 10s., y.r. 42*l.* 450
Ealing.—Blandford-rd., the Hollies, f., y.r. 34*l.*.. 450
Blandford-rd., The Ferns, with yard and stabling in rear, f., y.r. 49*l.* 640

By G. GERRETT & Co.

Norwood.—44 to 52 (even), Manor Park-rd., u.t. 87 yrs., g.r. 30*l.*, w.r. 156*l.* 1,375
45 and 47, Albert-rd., u.t. 63 yrs., g.r. 12*l.*, w.r. 61*l.* 16s. 435
4, Sunnybank, u.t. 59 yrs., g.r. 6*l.*, y.r. 50*l.* 290

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 11 6	per 1,000 alongside, in river.
Rough Stocks and Grizzles	1 9 6	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 5 0	,, ,, ,,
Flettons	1 8 0	,, at railway depôt.
Red Wire Cuts ..	1 12 0	,, ,, ,,
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,, ,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,, ,,
Do., Bullnose	4 10 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 5 6	,, ,, ,,
GLAZED BRICKS		
Best White and Ivory Glazed Stretchers.....	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers..	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers..	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	14 0 0	,, ,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,, less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	32 0	per ton, delivered.
Best Ground Blue Lias Lime..	25 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. 0d. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 3	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks ..	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Ho[illegible]n Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt.
,, ,, 6 in. sawn both sides landings	2	7 per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	12 0 0	per 1000 of 1200 at ry. dep.
,, best seconds ,,	11 10 0	,, ,,
16×8 best ,,	6 15 0	,, ,,
20×10 best blue Portmadoc ..	11 5 0	,, ,,
16×8 best blue Portmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green....	12 2 6	,, ,,
16×8 ,, ,,	7 5 0	,, ,,
20×10 permanent green	10 5 0	,, ,,
16×8 ,, ,,	5 17 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles..	41 6	per 1,000, at rly. depôt.
Hip and valley tiles....	3 7	per doz.
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	14 10 0	16 0 0	
Deals: best 3 by 9.....	13 10 0	15 0 0	
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	10 10 0	11 10 0	

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.	
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0		less than 7 in. and 8 in.
Deals: seconds	1 0 0		less than best
Battens: seconds	0 10 0	,, ,,	,,
2 in. by 4 in. and 2 in. by 6 in. ..	8 10 0	9 10 0	
7 in. by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0 0	
Foreign Sawn Boards— 1 in. by 11½ in. by 11½ in.	0 10 0		more than battens.
¾ in.	1 0 0		,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Swedish balks.....	2 15 0	3 0 0	
Pitch-pine timber (30 ft.).....	3 0 0	3 10 0	
JOINERS' WOOD.	At per standard.		
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0	
3 in. by 9 in.	20 0 0	21 0 0	
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0	
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0	
,, ,, 3 in. by 9 in.	16 10 0	18 10 0	
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0	
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0	
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0	
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0	
Do. 3 in. by 9 in.	17 0 0	18 0 0	
Battens.....	13 0 0	14 0 0	
Second yellow deals, 3 in. by 11 in.....	15 0 0	16 10 0	
Do. 3 in. by 9 in.	13 10 0	14 10 0	
Battens.....	11 0 0	12 0 0	
Third yellow deals, 3 in. by 11 in.....	12 10 0	13 10 0	
Do. 3 in. by 9 in.	12 0 0	13 0 0	
Battens.....	10 0 0	11 0 0	
White Sea and Petersburg :—			
First white deals, 3 in. by 11 in.	14 0 0	15 0 0	
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0	
Battens.....	11 0 0	12 0 0	
Second white deals 3 in. by 11 in.	13 0 0	14 0 0	
,, ,, ,, 3 in. by 9 in.	12 0 0	13 0 0	
,, ,, ,, battens.....	9 10 0	10 10 0	
Pitch-pine: deals	16 0 0	18 0 0	
Under 2 in. thick extra	0 10 0	1 0 0	
Yellow Pine—First, regular sizes..	32 0 0	33 10 0	
Broads (12 in. and up).....	2 0 0	more.	
Oddments	22 0 0	24 0 0	
Seconds, regular sizes	24 10 0	26 10 0	
Yellow Pine Oddments	20 0 0	22 0 0	
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6	
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0	
Small ,, ,, ...	0 2 3	0 2 6	
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6	
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8	
¾ in. do. do.	0 0 7	- - -	
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11	
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0	
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0	
Teak, per load	16 0 0	20 0 0	
American Whitewood Planks— Per ft. cube.....	0 3 0	0 3 6	
Prepared Flooring—	Per square.		
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6	
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17	
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0	
6 in. at 6d. per square less than 7 in.			
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6	
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6	
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6	
6 in. at 6d. per square less than 7 in.			

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars.....	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars" ..	10 10 0	- -
Mild Steel Bars.....	9 0 0	9 10 0
Hoop Iron, basis price.....	9 5 0	9 15 0
,, ,, galvanised.....	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.....	10 0 0	- - -
,, ,, to 24 g.....	11 0 0	- - -
,, ,, to 26 g.....	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.....	14 0 0	- - -
Sheet Iron, Galvanised, flat, best quality:—		
Ordinary sizes to 20 g.....	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.....	18 10 0	- - -

[See also page 251.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Proposed Public Offices	Aldershot U.D.C.	100*l.*, 75*l.*, and 50*l.*	Mar. 29
Twenty-five Houses	Coleraine (Ireland) U.D.C.	20*l.* and 10*l.*	April 21
*Market Hall and Shops	Oldham Corporation	50*l.*, 30*l.*, 20*l.*	May 6

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Supply of Articles and Execution of Works	Stepney Borough Council	Council's Engineer, 15, Great Alie-street, Whitechapel, E.	Mar. 10
*Supply of Railway Wagons	Cambrian Railways Company	Locomotive, &c., Superintendent, Oswestry	Mar. 11
Additions to Farm House, Delgaty, N.B.	.....	J. Duncan & Son, Architects, Turriff	do.
Street Works, Back Langley-terrace, &c.	Annfield Plain U.D.C.	T. J. Trowsdale, Surveyor, Annfield Plain	do.
Warehouse, Ardmore Distillery, Kennethmont, N.B.	.....	C. C. Doig, Architect, Elgin	do.
Sewage Outfall Works, Friar Park	West Bromwich Town Council	A. D. Greatorex, Civil Engineer, Town Hall West Bromwich	do.
Additions to the Station Hotel, Horsham	.....	W. Buck, Architect, Horsham	do.
House, Northland-road, Londonderry	.....	R. E. Buchanan, Architect, Castle-street, Londonderry	do.
Public Offices, &c., Abergarw	Ogmore & Garw U.D.C.	S. H. Stockwood, Post Office Buildings, Bridgend	do.
Additions to 65, St. John-street	Bridgewater Town Council	W. T. Baker, High-street, Bridgwater	do.
Additions to House and Shop, Prince-st., Bridlington	Mr. G. Colley	J. Earnshaw, Architect, Wellington-road, Bridlington	do.
Street Works, Fitzwilliam-street, &c.	Rawmarsh U.D.C.	W. J. Petch, Surveyor, Council Offices, Rawmarsh	do.
*Filling-up and Levelling Meadow	Fulham Borough Council	Council's Surveyor, Town Hall, Fulham, S.W.	do.
*Stoneware Pipes	Edmonton U.D.C.	G. Eedes Eachus, Town Hall, Edmonton	do.
Street Works, Stepney-lane, Hull	.....	E. Whitlock, Architect, 26, Scale-lane, Hull	Mar. 12
House, Donovan Estate, Cork	Hull Corporation	W. H. Hill & Son, Architects, 28, 8 uth Mall, Cork	do.
Lodge, West Park	.....	J. H. Hirst, City Surveyor, Town Hall, Hull	do.
Alterations to the Golden Lion Hotel, Kendal	Whiston R.D.C.	J. Stalker, Architect, 57, Highgate, Kendal	do.
Surveyor's Materials, Prescot, Lancs	Waterloo Mill Company	W. Goldsworth, Surveyor, Delph-lane Offices, Whiston	do.
Rebuilding Mill, Pudsey	Dumbarton County Council	Kendall & Bakes, Architects, Victoria-square, Leeds	do.
Road Metal, &c., Glasgow	Warrington Corporation	H. Hutcheson, 113, Wellington-street, Glasgow	do.
House, &c.	Gosport U.D.C.	T. Beesley, Architect, 28, Bold-street, Warrington	do.
Wrought Iron Railings	St. Helen's (Lancs) Town Council	H. Frost, Surveyor, Town Hall, Gosport	do.
Reservoir, Brown Edge	Northwich R.D.C.	J. J. Lacklang, Engineer, Town Hall, St. Helen's	do.
Road Works	Mr. W. Tremble	A. Fletcher, 16, Winnington-street, Northwich	do.
Additions to House, Stabling, &c., Burgh-by-Sands	Kingston-on-Thames	Johnstone Bros. Architects, Carlisle	do.
*Road Repairing	Uxbridge and Hillingdon Gas Co.	Borough Surveyor, Clattern House, Kingston-on-Thames	do.
*Concrete Foundation	Lewisham Borough Council	The Engineer, Gas Works, Uxbridge	do.
*Annual Contracts	.....	Council's Surveyor, Town Hall, Catford	do.
Schoolroom, Barnby Beccles	.....	R. S. Cockrill, Architect, Crossley House, Lowestoft	Mar. 13
Chapel, Hopkinstown, Wales	.....	A. O. Evans, Architect, Pontypridd	do.
Creamery, Tobercurry, Ireland	.....	J. Donohoe, Tobercurry	do.
Alterations to Hospital	Clones (Ireland) Guardians	R. Clarke, Workhouse, Clones	do.
Infirmary	Stratford-on-Avon Guardians	C. Smith & Son, Architects, 164, Friar-street, Reading	do.
Granite Road Metal (2,000 tons)	Clare (Suffolk) R.D.C.	W. H. Carr, Surveyor, Clare, Suffolk	do.
*Making-up South Croxted-road, Dulwich	Borough of Camberwell	W. Oxtoby, Town Hall, Camberwell	do.
*Painting & Cleaning, Western Fever Hospital, Fulham	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	do.
*Visitor's Room at Grove Hospital, Tooting	do.	do.	do.
Two Cottages, Pilton-street, Pilton	.....	J. Thomas, Bull Hill, Pilton	Mar. 14
Works at Wesleyan Chapel, Abersayron, Wales	.....	Rev. J. Lloyd, Greenland-terrace, Abersayron	do.
Water Supply Works, Danbury, Essex	Chelmsford R.D.C.	J. Dewhurst, Engineer, Avenue Chambers, Chelmsford	do.
Hotel, Blaengarw	Mr. J. Price	P. J. Thomas, Architect, Bridgend	Mar. 15
Twenty Houses, Blairadam, N.B.	The Fife Coal Company, Limited	Secretary, Fife Coal Company, Bowdenbeath	do.
Additions to 33, Regent-street, Swindon	.....	R. J. Beswick, Architect, 35, Regent-street, Swindon	do.
Bridge Works, Arnside	Westmoreland R.D.C.	R. Dobson, Jasmine Cottage, Milnthorpe	do.
Schools, Llanymynech, Wales	.....	Rev. G. O. Evans, Gardd, Llanymynech	do.
Granite Road Metal	Stafford R.D.C.	W. Morgan, 4, Martin-street, Stafford	do.
Surveyor's Materials, near Selby	Riccall R.D.C.	E. Townend, 1, Abbey-place, Selby	do.
Cottage, Longtown, Cumberland	.....	J. J. Millican, Park Gate, Springfield, Graitney	do.
Engine House, &c., Dale-street	Radcliffe U.D.C.	W. L. Rothwell, Engineer, Council Offices, Radcliffe	do.
Restoration of Chapel, North Burton	Trustees	S. Dyer, Architect, Bridlington Quay	do.
Road Metal (1,400 tons)	Bridlington Corporation	A. E. Matthewman, Town Hall	do.
Additions to 198, Regent-street, Swindon	Mr. Hunter	R. J. Beswick, Architect, Regent-street, Swindon	do.
Bakehouse, Shops, &c., Horton-street, Halifax	Messrs. G. Whitley & Son	Walsh & Nicholas, Architects, Museum Chambers, Halifax	Mar. 17
Boring, Great Baddow	Chelmsford R.D.C.	J. Dewhurst, Engineer, Avenue Chambers, Chelmsford	do.
Road Metal, Hessle, Hull	Sculcoates R.D.C.	A. Greaves, Surveyor, Hessle	do.
Water Supply Works, Prestonpans, N.B.	Haddington County Council	J. D. Watson, Council Offices, Haddington	do.
*700 feet 9 inches Stoneware Pipe Sewer, &c.	Hornsey U.D.C.	E. J. Lovegrove, Southwood-lane, Highgate	do.
*Steel and Ironwork for Electric Car Shed	Manchester Corporation	J. M. McElroy, 55, Piccadilly, Manchester	do.
Alterations to Cottages, Farm Buildings, &c. Aylesbury	Trustees of Wurdwood's Charity	F. Taylor, 26, Temple-street, Aylesbury	do.
Street Works	Sevenoaks U.D.C.	Jabez Mann, Civil Engineer, Council Offices, Sevenoaks	do.
Church, Waunllwyd	.....	J. Phillips, Cwm-road, Waunllwyd	do.
Twenty-six Cottages, Ebbw Vale, Mon.	Mr. J. F. Jones	B. J. Francis, Architect, Abergavenny	do.
Additions to School, Quainton	Trustees of Saye & Sele Charity	T. Taylor, Architect, 26, Temple-street, Aylesbury	do.
Granite Road Metal, near Burton-on-Trent	Tutbury R.D.C.	H. S. Tebbitt, 320, Shobnall-street, Burton-on-Trent	do.
Drainage Works	Kirkheaton U.D.C.	Marriott & Son, Civil Engineers, Church-st. Chambers, Dewsbury	do.
Cottage, Meadowfield, near Durham	Weardale Water Company	Askwith, Civil Engineer, South-road, Bishop Auckland	do.
*Annual Contracts	Southgate U.D.C.	C. G. Lawson, Council Offices, Palmer's Green, N.	Mar. 18
*Rolled Steel Joists	do.	do.	do.
*2,500 yards Sewers	do.	do.	do.
Granite Road Metal	Rushden (Northants) U.D.C.	W. B. Madin, Engineer, Vestry Hall, Rushden, Northants	do.
*Repairing Roads	Hornsey U.D.C.	E. J. Lovegrove, Southwood-lane, Highgate, N.	do.
Farmhouse, Ffynonwen, Wales	.....	D. T. Lane, Surveyor, Wheat-street, Brecon	do.
*Making-up Roads	Tottenham U.D.C.	W. H. Prescott, 712, High-road, Tottenham	do.
*Making-up and Paving Street	Fulham Borough Council	Council's Surveyor, Town Hall, Walham Green, S.W.	Mar. 19
Refuse Destructor	Wallsend Town Council	G. Hollings, Borough Surveyor, Wallsend	do.
*Disinfecting Chamber, &c.	Lambeth Borough Council	H. Edwards, Town Hall, Kennington Green, S.E.	Mar. 20
Foundations, &c., Parkside Asylum, Macclesfield	.....	H. Beswick, County Architect, Newgate-street, Chester	Mar. 22
Water Supply Works	Roscommon (Ireland) R.D.C.	T. T. O'Keeffe, Council Offices, Roscommon	do.
*Maintenance and Repair of Main Roads for 3 years	Kent County Council	County Surveyor, 86, Week-street, Maidstone	Mar. 24
*Additions, &c., to Isolation Hospital	Epsom U.D.C.	Council's Surveyor, Bromley Hurst, Church-street, Epsom	do.
*Ottawa and Baffin Buildings, Prestons-road, Poplar	London County Council	Architect's Department, Housing Branch, 18, Pall Mall East, S.W.	Mar. 25
*Fence-Wall at North-Eastern Hospital	Metropolitan Asylums Board	A. & C. Harston, Architects, 15, Leadenhall-street, E.C.	Mar. 26
*Making-up, &c., Woodlands-road, Hassocks	Cuckfield R.D.C.	E. Waugh, Boltro-road, Haywards Heath	do.
Pumping Station	Ilkeston Water Board	G. & F. Hodson, Engineers, Town Hall, Ilkeston	Mar. 27
*New Bridge, Sutton Ford, near Rochford	Essex County Council	County Offices, Duke-street, Chelmsford	do.
Surveyors' Materials	Great Harwood (Lancs) U.D.C.	A. H. Dunkin, Surveyor, Town Hall, Great Harwood	Mar. 29
Slaughter Houses, Wood and Balfour Streets	Great Harwood U.D.C.	do.	do.
*Percy House Schools, Isleworth	Brentford Union	W. H. Ward, Paradise-street, Birmingham	April 1
*Public Library, Plaistow	West Ham Borough Council	Town Clerk, Town Hall, West Ham, E.	do.
*Hot-Water Heating, &c.	Holborn Union	J. A. Battersby, Guardians' Offices, Clerkenwell-road, E.C.	April 2
*385 feet of 12-inch Pipe Sewer	Royal Borough of Kensington	Borough Engineer, Town Hall, High-street, Kensington, W	April 7
*Municipal Buildings	Hereford Town Council	H. A. Cheers, Architect, Twickenham, W.	No date
*New Infirmary for Women	Stratford-on-Avon Union	C. Smith & Son, Architects, 164, Friar-street, Reading	do.
*Additions to Schools, Potters-road, New Barnet	.....	F. Child, Surveyor, 65, Chancery-lane, W.C.	do.
Additions to "The Priory," Headingley	Broughty Ferry (N.B.) T.C.	Danby & Simpson, Architects, 10, Park-row, Leeds	do.
Roof at Gasworks	Bradford Dyers' Association	F. Waddell, Engineer, Council Offices, Broughty Ferry	do.
Shed, &c., Hunsworth, Yorks	.....	Engineer, 39, Well-street, Bradford	do.
Factory, Leyton, Essex	South Westmoreland R.D.C.	W. H. Newall, 25, Brampton-road, N.E.	do.
Bridge Works, Kentmere	.....	J. Bintley, Engineer, 7, Lowther-street, Kendal	do.
Church, Standishgate, Wigan	Longtown (Heref'dsh') U.D. Sc. Bd.	F. W. Dixon, Architect, Trevelyan Buildings, Manchester	do.
House		E. A. Johnson, Architect, Abergavenny	do.

[See also next page.

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PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Chief Draughtsman	Aberdeen School Board	120*l.*	Mar. 14
*Assistant Road Foreman	Ealing Borough Council	40*s.* per week	Mar. 22
*Architectural Assistant	Borough of Hampstead	4*l.* 4*s.* per week	No date

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. *Contracts, pp.* iv. vi. viii. x. xii. & xx. *Public Appointments,* xviia. xviiib & xx.

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London £ s. d.	£ s. d.
IRON—		
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 10 0	10 0 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 5 0	- - -
Pipe in coils	14 15 0	- - -
Soil Pipe	17 5 0	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 0	- - -
Thin ,,	0 1 1½	- - -
Copper nails ,,	0 1 1½	- - -
BRASS—		
Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths	3d. ,, ,,
26 oz. thirds	4½d. ,, ,,
,, fourths	4d. ,, ,,
32 oz. thirds	5½d. ,, ,,
,, fourths	5d. ,, ,,
Fluted sheet, 15 oz.	3d. ,, ,,
,, 21 ,,	4d. ,, ,,
½ Hartley's Rolled Plate	2d. ,, ,,
⅝ ,, ,, ,,	2½d. ,, ,,
½ ,, ,, ,,	2¾d. ,, ,,

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes per gallon	0 2 0
,, ,, ,, in barrels ,,	0 2 10
,, ,, ,, in drums ,,	0 3 0
Boiled ,, ,, in pipes ,,	0 2 11
,, ,, ,, in barrels ,,	0 3 0
,, ,, ,, in drums ,,	0 3 2
Turpentine, in barrels ,,	0 2 6
,, in drums ,,	0 2 8
Genuine Ground English White Lead per ton	21 0 0
Red Lead, Dry ,,	20 10 0
Best Linseed Oil Putty per cwt.	0 8 6
Stockholm Tar per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

J. A. S. (We cannot print your letter.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR: those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BANDON (Ireland).—For the erection of a dwelling-house, for Mr. H. Harte. Messrs. W. H. Hill & Son, architects, 28, South Mall, Cork:—

Daniel Murphy, Market-street, Bandon, Cork* £550

BIRMINGHAM.—For rebuilding Waterworks Tavern, Birmingham, for Messrs. Truman, Hanbury, Buxton & Co., Ltd. Mr. Charles Hook Collett, architect. Quantities by Mr. Henry Clover:—

Whitehouse & Sons	£3,350	Turton	£3,143
Moorhouse	3,204	Harvey Gibbs	2,921
Gowing & Ingram	3,175	Morris*	2,849
Lee & Son	3,150		

BREWOOD (Staffs). — For reseating the nave of the parish church in oak. Mr. Ashton Veall, architect, Wolverhampton:—

Hatch & Sons, Lancaster* £558

[Twenty-six tenders received, from £340 to £1,300.]

CARDIFF.—For additions to kitchens and larders at the Cardiff Infirmary. Mr. Edwin Seward, architect, Cardiff:—

F. Small, Edward's-place, Cardiff* .. £453 9 4

CHISWICK.—For extension of carriage factory, Chiswick. W., for Henry Whitlock, Ltd. Mr. T. Wilson, architect, 34, New Bridge-street, E.C.:—

L. L. Leeder & Co.* £1,397

ELLON (N.B.)—For the erection of a house, Craigs of Auchterellon, for Mr. Thomas Mair. Mr. W. Davidson, architect:—

Masonry.—Andrew Smith*	£392 10
Carpentry.—W. Auld*	258 0
Slating.—W. Fyvie*	67 15
Plastering.—W. Givewright*	94 7
Plumbing.—Alex. Gibb*	85 10
	896 2

[All of Ellon.]

GRIMSBY.—For the erection of five houses with shops, restaurant, stabling, and bakehouse, Cleethorpes, for Messrs. R. S. & C. Osborne. Mr. E. E. Bentley, architect, 1, Pelham Chambers, Old Market Place, Grimsby:—

Wm. Ion, Cleethorpes* £5,807

HALIFAX.—For the erection of a store shed at tram depot, Gibbet-street, for the Corporation. Mr. Jas. Lord, C.E., Town Hall, Halifax:—

Masonry.—Naylor & Sons, Halifax*	£117 2 0
Joinery.—Greenwood & Son, Halifax*	29 16 11
Slating and Plastering.—Bancroft & Son, Halifax*	17 14 3
Plumbing and Glazing.—S. S. Thompson, Halifax*	4 14 0

HUNSTANTON.—For new stables, &c. the Glebe Hotel, Hunstanton. Mr. Herbert J. Green, architect and surveyor, Norwich:—

W. H. Brown	£1,719 0 0	Reuben Shanks	£1,394 0 0
W. Sindall	1,515 0 0	W. Saint	1,384 0 0
John Cracknell	1,419 0 0	A. F. Foreman	1,370 12 0
Chambers & Sons	1,411 6 3	F. Giddings, St. Ives, Hunts†	1,338 0 7

LONDON.—For extension of stables, England's-lane, Hampstead, for J. Richards, Ltd. Mr. T. Wilson, architect, 34, New Bridge-street, E.C.:—

Thompson	£499	Pugh	£447
Pearson	475	Williams*	420
Littlewood	473		

LONDON.—For building house in Upper Tooting Park, Trinity-road, Upper Tooting, S.W. Mr. W. Hunt, architect and surveyor, Norfolk-street Strand:—

W. & C. Brown, Wandsworth Common, S. W. £1,075

LONDON.—For the erection of detached residence in Hendon-avenue on the Grass Park estate, Church End, Finchley, for Mr. J. J. Bridgewater. Mr. Walter Bennett, architect, Church End, Finchley, N. Quantities by Mr. William Hawker, 73, Moorgate-street, E.C.:—

Freeman & Barber	£3,500	Coulsell Bros.	£2,863
Jesse Phœnix	2,038	W. Tout	2,825
Gough & Co.*	2,934		

[Architect's estimate, £2,800.]

MALTON (Yorks).—For the execution of water supply works, Welburn, for the Malton Rural District Council Mr. R. Richardson, C.E., Town Hall, Malton. Quantities by Engineer:—

Reservoir.

Anthony Lyons, Norton, Malton £135 7 0

Excavator's Work.

Jos. Morgan, Conrysthorpe, Malton .. £65 0 0

Collecting Works and Pumping Station.

Jos. Morgan, Conrysthorpe, Malton .. £73 15 0

Pipes.

J. & R. Ritchie, Middlesbro' £105 6 3

Fittings and Plumber's Work.

Thos. Leefe, Malton £188 13 4½

Pumping Machinery.

Geo. Harrison & Co., Ripon £168 17 0

£935 18 7½

Estimate 945 0 9

SNETTISHAM.—For new house at Snettisham, Norfolk, for Mr. E. Lambert. Mr. Herbert J. Green, architect and Surveyor, Norwich:—

Chilvers & Son	£1,503 10 4	Reuben Shanks	£1,264 0 0
F. Giddings	1,292 0 0	G. Southgate, Hunstanton†	1,242 0 0
Chambers & Son	1,285 0 0		

WALLINGTON (Surrey).‡—For the construction of about one mile of new roads, with sewers, soakaways, &c., complete, on the Little Woodcote Estate, for the Imperial Property Investment Co., Ltd. Mr. W. J. Parker, surveyor, 38, Great James-street, Bedford-row, W.C.:—

J. Dunmore	£7,459	F. Cottrell	£5,785
Neave & Son	6,964	T. Adams	5,772

‡ The list published last week was an unauthorised one, and appears to have been incorrect.—ED.

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect:—

† *Recommended for acceptance.*

HACKNEY (Mowlem-street).—Enlargement: Boys' and girls', 700. Classrooms: Boys', 50; girls', 50. Additional cloakrooms and lavatories for boys and girls, providing infant teachers' room and girls' staircase, and stockrooms for boys and girls:—

McCormick & Sons	£3,398	Chessum & Sons	£3,026
Grover & Son	3,256	Willmott & Sons	3,019
Leslie & Co., Ltd.	3,151	Williams & Son	3,015
T. L. Green	3,147	W. Shurmur	2,987
Gregar & Son	3,135	F. & F. J. Wood	2,985
Clarke & Bracey	3,115	L. H. & R. Roberts	2,984
Snewin Bros. & Co.	3,080	Lawrance & Sons	2,911
Staines & Son	3,056	C. Cox*	2,910
Treasure & Son	3,041		

Structural alterations and repairs to buildings.

SAFFRON-HILL (Finsbury).—Removing the defective zinc covering and gutters to roof over Artroom and replacing them with new material [second competition]:—

W. Hornett	£184 0	General Builders, Ltd.	123 0
T. L. Green	143 0	Stevens Bros.*	118 0
Vigor & Co.	138 10	Chinchen & Co.	45 10
Marchant & Hirst	125 0		

MARYLEBONE (Kentish Town-road).—Executing alterations in drainage and sanitary arrangements; providing new stoves; also minor repairs and cleaning and painting throughout. [Second competition].

E. Triggs	£490 0	M. Pearson	£410 0
Stevens Bros.	479 0	F. Chidley*	325 6
Marchant & Hirst	465 0		

[See also next page.

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* TOWER HAMLETS (Hanbury-street). — Altering position of boys' entrance doorway, in order to obviate passing through the schoolroom, as at present; including new fixed glazed framing to form passage and lobby in connexion therewith :—

Gibb & Co.	£297 0	J. F. Holliday	£212 0
T. H. Jackson	274 10	G. Barker	205 0
A. E. Symes	245 0	A. J. Sheffield	190 0
Johnson & Co.	241 0	F. & F. J. Wood *	190 0

Cleaning and painting.

Unless where otherwise stated, the interior work at the following schools will be carried out between March 8 and April 5, 1902, and the exterior work between March 8 and April 12, 1902 :—

CHELSEA (Oxford-gardens).—Painting exterior and cleaning interior (old portion) :—

G. H. Sealey	£308 0	C. Gurling	£171 0
C. Curd	207 0	G. Neal	167 10
F. Chidley	179 10	W. Chappell	165 0
W. R. & A. Hide	172 15	W. Hammond	137 0
S. Polden	172 15	Chinchen & Co.*	134 14

FINSBURY (Buckingham-street) —Painting exterior and cleaning interior (old portion), and painting interior and exterior (enlargement) :—

J. Watkins	£513	W. Hornett	£381
C. & W. Hunnings	448	Marchant & Hirst	378
McCormick & Sons	420	S. Polden*	350
Stevens Bros.	394		

HARGRAVE PARK (Finsbury).—Painting interior and exterior (old and new portions) :—

Bristow & Eatwell	£705 0	C. & W. Hunnings	£596 10
Dearing & Son	603 0	T. Cruwys	576 0
Marchant & Hirst	669 0	Stevens Bros.	548 0
McCormick & Sons	638 0	Sayer & Son*	473 0

HARVIST-ROAD (Finsbury).—Painting interior and exterior :—

C. & W. Hunnings	£379 10	Stevens Bros.	£333 0
J. Watkins	343 0	Sayer & Son	297 0
Marchant & Hirst	334 0	Bate Bros.*	265 0

ROTHERFIELD-STREET (Finsbury). — Painting interior and exterior :—

Dearing & Son	£666 0 0	Holliday & Greenwood, Ltd.	£547 0 0
Grover & Son	652 0 0	Marchant & Hirst	531 0 0
McCormick & Sons	616 0 0	Willmott & Son	500 0 0
C. & W. Hunnings	600 15 6	Haydon & Sons	438 15 0
		G. Barker	437 0 0
		A. W. Derby*	423 0 0

GREENWICH (Ennersdale-road).—Painting interior and exterior :—

A. J. Sheffield	£367 0 0	W. Hornett	£293 0 0
C. G. Jones	333 15 0	T. H. Jackson	293 0 0
W. Banks	324 12 6	H. Groves	275 0 0
Lathey Bros.	323 0 0	Hayter & Son*	265 0 0
E. Proctor	309 10 0		

†ROCHELLE-STREET (Hackney).—Painting interior and exterior (infants') :—

Silk & Son	£240 0	G. Wales	£181 10
Shurmur & Sons, Ltd.	195 0	Haydon & Sons	174 0
Barrett & Power	192 0	Corfield & Co.	167 0
J. F. Holliday	191 0	Chessum & Sons	165 0
Willmott & Son	185 0	E. Triggs*	135 0

† In this case the interior work will be carried out between March 15 and April 5, 1902, and the exterior work between March 15 and April 12, 1902 :—

HACKNEY (†Upton House). — Painting interior (old portion) :—

Grover & Son	£494	Vigor & Co.	£382
Barrett & Power	450	Willmott & Son	382
Chessum & Sons	432	M. Pearson	380
Silk & Son	420	Shurmur & Sons, Ltd.	379
A. J. Sheffield	387	G. Wales*	343

† Six weeks will be allowed for the execution of this work.

KING AND QUEEN-STREET (East Lambeth.—Painting interior :—

Martin, Wells, & Co.	£805 0	Lorden & Son	£488 15
Hudson Bros.	755 0	King & Son	448 0
W Downs	685 0	E. Triggs	445 0
Maxwell Bros., Ltd.	573 0	Garrett & Son	419 0
W. V. Goad	545 0	Sayer & Son	394 0
Holliday & Greenwood, Ltd.	493 0	G. Kemp	375 0
		J. & M. Patrick*	368 0

MARYLEBONE ("Brecknock"). — Cleaning interior (boys', girls', and infants') :—

Balfour & Co.	£292 10	S. Polden	£250 0
Marchant & Hirst	287 0	Stevens Bros.	245 0
W. Chappell	280 0	Sayer & Son	212 0
Bristow & Eatwell	269 0	F. Chidley*	210 0
C. & W. Hunnings	266 10		

ROLLS-ROAD (Southwark). — Painting interior (old portion) and interior and exterior (enlargement) :—

King & Son	£660	W. J. Howie	£457
Maxwell Bros., Ltd.	567	Rice & Son	449
J. & M. Patrick	566	E. Proctor	424
Johnson & Co.	514	H. J. Williams*	380
Bulled & Co.	459		

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ILLUSTRATIONS.

Westminster Cathedral: The Apse ..... From a Drawing by Mr. W. Curtis Green.
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New London Rail and Tramway Schemes.

THE Londoner who travels daily between his suburban retreat and one of the several busy centres of the great city, is not infrequently a man with a grievance. He may object to the duration, discomfort, or the uncertainty of his journey by rail or tramway, or to the necessity for a second instalment of travel after reaching the discharging point; or, again, he may object to all these things. But he makes no effort of any kind to remove, or to mitigate, the conditions about which he grumbles in a resigned sort of way to his fellow-sufferers. His journeys are beguiled by the perusal of some favourite paper, wherein he may find harrowing accounts of extravagant outlay on tramways by the London County Council, of the devastating effects of "the tube," and of audacious American attempts to interfere with metropolitan traffic facilities. At these things he shakes his head sadly, but it never occurs to him that if he and his fellows would but awake, and arise in their might, the whole cumbrous and jog-trot system of locomotion now prevailing could be swept away, or merged in a swiftly moving flood of improvements. Yet while the Londoner is alternately dozing and complaining in his corner seat, improvements are being developed, and striking evidence of these is afforded by the map recently published by Mr. Stanford.* In this publication are included railways and tramways, in operation, sanctioned, and proposed. Of railways and tramways in operation little need be said. The older railways were not primarily intended for metropolitan so much as for national use, and as a general rule their terminal stations were placed in very out-of-the-way situations. This drawback has since been removed to some extent by the construction of more central stations, and by the aid of running powers over newer lines, but the popularity of these communications has altogether outgrown their carrying capacity. Suburban lines built in the earlier part of the last generation were usually designed to afford communication from east to west along the most devious and inconvenient routes possible, and later some equally roundabout communications were established between north and south. In quite recent times the idea has been realised of affording more direct routes, but much remains to be done.

Amongst the railways already sanctioned there are several of great value. The Whitechapel and Bow Railway is calculated to relieve pressure at outgoing points, and its connexion at Bromley-by-Bow with the London, Tilbury, and Southend line provides further means of access to suburban and rural parts of Essex. The Great Northern and City Railway will do much to abolish the fearful overcrowding of trains from Finsbury Park to Broad-street and Moorgate-street Stations, and will bring passengers direct from Wood Green to the Bank. The Great Northern and Strand Railway, branching from Finsbury Park, will discharge passengers in the immediate vicinity of the Law Courts, thus obviating the necessity for a tedious, and frequently unpleasant, journey by omnibus from King's Cross. Another useful line will be the Charing Cross, Euston, and Hampstead Railway, giving residents in the north-west a direct route to the extremely busy district around Trafalgar-square, and affording valuable means of connexion between the London and North-Western terminus and the same locality. A branch from this line is shown on the map, commencing at Kentish Town-road and ending in a somewhat inconsequent way near the Highgate Station of the Tottenham and Hampstead Junction Railway. The Baker-street and Waterloo line is indicated on the map, but for some unknown reason it is not accorded a place in the reference table, where similar, and not more deserving, undertakings are briefly described. This line, with a branch to Euston and another to Marylebone and Paddington, will serve to distribute heavy human freight from four of the most inconveniently placed termini in the whole metropolis, besides placing semi-suburban districts in direct communication with the West End, and affording means of connexion between north and south by a junction with the Charing Cross, Euston, and Hampstead Railway. A line from the Marble Arch to Cricklewood is also marked on the map as being sanctioned, although, so to speak, boycotted by the reference table. By connexions at Paddington with the Baker-street and Waterloo line, and at the Marble Arch with the Central London line, this railway should be of considerable value, and will be still more so when carried on to Victoria as proposed. In the extreme west we notice with regret that two lines are projected through the little known and old-world "parish" of Twyford. Although less than a mile and a half from the busy railway junction at Willesden and within six miles of Piccadilly, Twyford is, or was a year or two ago, one of the most rural places in England, and curiously enough it was, down to comparatively recent times, an extra-parochial liberty owing to the fact that Twyford Abbey was omitted from the general ecclesiastical survey. In the south, the line joining London Bridge and Waterloo, with feeders from Walworth and Brixton, will form another useful connecting link between north and south, as well as a rapid means of conveying business people to and from the City. Of tramway lines sanctioned, the only important examples are two branches from the Angel, one along Rosebery-avenue to Gray's Inn-road, and the other to the Metropolitan Cattle Market. Although the record of lines sanctioned is by no means extensive, yet when taken in conjunction with the Central London Railway, the newly-opened line to the Angel, and the development of electric tramways in the western suburbs, it will be seen that considerable progress has been made.

Coming now to railways proposed, we find far more to occupy attention. Commencing with the north-east district, the first fresh feature is a line called the East London, City, and Peckham Railway, running from Plaistow viâ the East India Docks, Commercial-road, and Whitechapel to Fenchurch-street; thence crossing the river, and ending near Peckham Rye. So far as the northern arm of this line is concerned, it will no doubt be appreciated by the working classes and by many of those employed in the City whose remuneration suggests strict economy both in house rent and in travelling expenses.

* "A New Map of Metropolitan Railways, Tramways, and Miscellaneous Improvements." Deposited at the Private Bills Office, November 30, 1901, for Session 1902. London: Edward Stanford, 1902. Price 6s.

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The City and North-East Suburban Railway is intended to start from Queen Victoria-street, proceeding near the riverside towards Fenchurch-street, passing thence along Whitechapel-road, through Bethnal Green, Hackney, and Leyton to Walthamstow. Beyond Hackney a loop line and connexions with other railways are also suggested. This line taps an exceedingly populous district, of which Leyton and Walthamstow have hitherto been solely dependent on the Great Eastern Railway and the line of horse trams along Lea Bridge-road. The North-East London Railway (No. 2), starting at Fleet-street, is intended to pass by Cannon-street Station, proceeding along Bishopsgate-street, through Shoreditch, Dalston, Stoke Newington, and Stamford Hill, to Tottenham, having a branch through Upper Clapton into Essex. This line passes through a thickly-populated part of London, where the tram services are largely patronised, partly because they are cheaper and, taking everything into account, not less expeditious than the train services. A rapid electric railway should therefore be an immense boon along the route mentioned. A proposed extension of the electric line from the Angel to St. Pancras and Euston is another admirable idea marked on Mr. Stanford's map, to which no reference is made on the table before mentioned. Such a junction as this would afford one more alternative route to the City for North-Western, Midland, and Great Northern passengers, in addition to facilitating communication between north and south. In the north-west district nothing new is proposed beyond an extension of the Charing Cross and Hampstead Railway towards Edgware, and perhaps for the time being nothing is urgently wanted.

Between the City on one hand, and the western and south-western districts on the other, many improvements are foreshadowed by the Bills now before Parliament. The Central London Railway is proposed to be extended along Goldhawk-road to The Grove, down which it will pass to Hammersmith Broadway, thence along Hammersmith and Kensington roads, Kensington Gore, Knightsbridge, and Piccadilly to the Strand, ultimately joining the existing Bank station in the City by means of a loop passing beneath Liverpool-street Station. Thus a "circle" would be formed providing a double set of up and down lines to and from the City and West End, and presenting great possibilities in the way of picking up traffic brought from other quarters by tramways and railways. The extension would destroy the almost isolated condition from which Liverpool-street now suffers, besides helping to relieve the streets from passengers discharged at Ludgate Hill and Charing Cross stations. The Brompton and Piccadilly Railway is proposed to be carried from Holborn through Piccadilly and Fulham-road to Brompton, terminating at Parson's Green, once a secluded place with quaint red brick houses amidst cabbage fields that are now devastated by bricks and mortar unalleviated by any visible sign of the architect's hand. The Charing Cross, Hammersmith, and District Electric Railway is shown extending from Adam-street, whence two branches diverge, one passing under the Mall and the other under Piccadilly, to meet at Hyde Park Corner, following the main road thence to Hammersmith and terminating in a power station at Barnes. The King's-road Railway is ultimately designed to connect Putney with Victoria, where competition with the existing companies is sadly wanted.

Two important lines are projected by the London United Electric Railways. One starts with a loop round Charing Cross station, and proceeds by way of the Mall and Constitution Hill to Hyde Park Corner, and thence to Hammersmith with a branch to a power station near the well-known landmark, "The Crabtree." At Hammersmith Broadway, the line turns to the right through Brook Green and again along Holland-road, forming a loop which is closed at Addison-road. The second line commences at Clapham Junction, crosses the Thames at Grosvenor-road, where a tramway will ultimately be established to convey passengers as far as Lambeth Bridge, and the railway continues beneath Sloane-street and Hyde Park to the Marble Arch and Paddington. The latter line will be a most welcome innovation to numerous passengers who are now compelled to use the South Coast railway to Victoria, there to struggle at the omnibus stand for inside seats in winter, and outside seats in summer, frequently with unsatisfying results. The route is further valuable as one more link between north and south. Another line is described in the reference table as the Piccadilly and City Railway (No. 2), and its most remarkable feature appears to be that, starting from Charing-cross and ending at Hammersmith, it does not go anywhere near the City. On the south side of the river, Wimbledon is to be served by a new railway, traversing Wandsworth, Battersea, Lambeth, and Southwark, crossing the river and entering the City next to Cannon-street station. At present Wimbledon people have only the South-Western route, with its annoying change of carriages at Waterloo, the devious and unwholesome alternative presented by the Underground Railway, and that offered by the wonderfully circumambient lines of the South Coast system. A direct line to the City is, therefore, a desideratum. The new London and Brighton Electric Railway is a metropolitan railway in the sense that if made it will serve the useful daily purpose of conveying people into and out from town, and so of relieving other lines. Of course this venture is being vigorously opposed by the rival company. It is only natural that it should be; but why Parliament should allow traders to enhance the cost of rival undertakings, and to delay their inauguration to the detriment of the innocent and long-suffering public, we really cannot imagine. It is proposed that the Victoria, Kennington, and Greenwich Railway should proceed south-east from Victoria, passing near the Oval, through Camberwell and New Cross to Greenwich. The projected line should rejoice the hearts of the numerous travellers who suffer from the South-Eastern and Chatham Railway service to the West-end. Between Wimbledon and Dulwich there is a large district with a rapidly-increasing population, which being beyond the reach of the numerous facilities afforded in the neighbourhoods of Brixton and Clapham would gladly support an alternative to the South Coast Railway, now possessing a virtual monopoly, tempered, but hardly stimulated, in one or two places by casual competition from the South-Eastern and Chatham Railway Company. For residents in this region there is no promise in Mr. Stanford's map. Passing a little more to the east, we notice the proposed City and Crystal Palace Railway, to start from Cannon-street and to finish at Penge, passing through Southwark, Peckham, Forest Hill, and Sydenham. This, again, ought to act as an awakening influence on existing lines, and to be a material aid in the daily labour of moving the floating population of the City. Running more or less parallel with the last-mentioned line is the southern portion of the East London, City, and Peckham Railway, terminating at the upper end of Peckham Rye. No attempt is being made to bring passengers to the City from the more eastern parts of suburban South London, and this we think to be unnecessary for the present, as the bottle-necked terminals of existing lines should be considerably relieved by means of the communications already suggested.

We turn now to examine briefly the tramway lines projected for the Metropolis, commencing, as before, in the north-east. Here nothing of importance is to be found, and the first development of consequence is a line of rails from the Marble Arch to Cricklewood, with a branch from Abercorn-place to Harrow-road, both promoted by the London County Council. From the same starting point a line, proposed by the London United Tramways, is to run to Shepherd's Bush, which is evidently destined to become a great clearing place for passengers in the far west. Hence a branch line is to be taken to Latimer-road, and the main line will be continued to Hammersmith Broadway, another important junction of the future. From Willesden Junction a line by the same company is intended to proceed down Scrubs-road and Wood-lane, meeting the Shepherd's Bush to Hammersmith rails before Brook-green is reached. Going a little more west, a branch is proposed from the existing electric tramway to East Acton and joining at Acton station on the Great Western Railway a tramway running from Acton village, if it may still be so called, to Harlesden-green. From Hammersmith two other main lines are proposed, one to Richmond and the other along Fulham Palace-road to Putney. County Council tramways are to run along the river side almost continuously from Battersea Bridge to Blackfriars, and sundry other connecting links between north and south are proposed by the same body. The latter were noticed in our columns a short time ago, and need not now be mentioned in detail. On the southern side of the Thames the London County Council proposes a tramway route from Clapham Common through Wandsworth and Putney Heath to the Robin Hood Gate of Richmond Park. From the present terminus at Streatham the lines are to be prolonged to Norbury railway station; at Camberwell Green a tramway is to start, running through the highly respectable and delightful district of Denmark Hill, and, together with an existing line from Peckham, joining on to the Crystal Palace Light Railway at Lordship-lane. South of the Crystal Palace the Croydon District Electric Tramways propose to run in all directions, so as to bring home to quiet residents the truth that they do not live so very far away from the great hive of men after all. Lewisham is to be connected up to New Cross by a

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short branch line under the auspices of the London County Council; the restfulness of Blackheath and Shooter's Hill are to be invaded by a line ending at Eltham Common, where a further tramway route will be found extending from Woolwich Arsenal to Eltham village. Finally, the southern extremity of the Blackwall Tunnel will be connected by a branch line with an existing tramway at East Greenwich.

A careful study of Mr. Stanford's map reveals the fact that the proposed improvements far outweigh in importance those already sanctioned, and, assuming them to be duly completed, there can be no doubt that one of their ultimate effects will be to change the aspect of many outlying districts within a comparatively short space of time. The inevitable substitution of electric for horse traction will make the change still more rapid, for tramways will then compete on more equal terms with railways. The daily exodus from business quarters of the metropolis will be conducted with greater comfort, but perhaps not with greater celerity, because all classes will travel greater distances—some to the outer suburban districts of to-day, and others to find more secluded spots, where tramway bells and cheap villas are not.

NOTES.

A Day's Work in Bricklaying.

A LONG letter from Mr. Stewart, the building manager to the British Westinghouse Electric Co., relating to the number of bricks per day laid by the bricklayers engaged in the erection of the works for that company at Manchester, appeared last Monday in the *Times*. Replying to the questions, "What is the thickness of the walls? Was mortar or cement used?" Mr. Stewart says that in no instance are the walls less than 19 in. thick, and that in some instances they are 23 in. thick, also that mortar was used, not cement. All the walls are "piers." In the centre of each brick pier is a large "Z" bar steel column. With one exception all the buildings are faced with No. 2 stock brick. This work may therefore be regarded as closely approximating in character to that performed by the bricklayers employed by the London County Council, but the average number of bricks laid per man per day was 1,400, as against the trade union standard of 450, or the London County Council average of 330. For "common work" the Westinghouse now averaged 2,250 bricks per man per day. Some explanation of the difference between the speed of British and American work is to be found in the following statement. "Our mortar is made much softer than that commonly used in England, and the bricks are laid by a light pressure of the hand and a light tap of the trowel, instead of by repeated hammering of the trowel to force the brick into place in stiff mortar. By the use of soft mortar we can lay enough mortar with one stretch of the trowel for half a dozen to a dozen bricks." Now, one stretch of the trowel with stiff mortar such as is used in this country will suffice only for three bricks, and it is evident, therefore, that since each trowel charge of stiff mortar is of greater weight, and is more difficult to work, than the same charge of sloppy mortar, and will suffice for less than one half the number of bricks, the weight of mortar and the work expended on a given area of finished brickwork laid on the British system must be much greater than a similar area laid on the American system. For 9-inch walls there is no doubt that the maxim, "Wet bricks and stiff mortar," must be retained, but it is possible that for walls exceeding 18 in. in thickness British builders may without much risk increase the speed of bricklaying by using more water in the mortar. We are of opinion that the use of sloppy mortar in the American fashion produces inferior brickwork to that erected on the British system, though we have never heard that American brickwork is unsafe, and modern factories are seldom required to be durable in the British sense of the term. But even for high-class British work the number of bricks laid per day should not be less than 600.

The Plumbers' Registration Bill.

THE Plumbers' Registration Bill, which was read a third time and passed in the House of Lords this week, we should imagine will be hailed with satisfaction by the community at large. To every householder it is of the utmost importance that the plumbing work about his house should be most efficiently performed, yet as to no class of work is it so difficult for him to satisfy himself as to its quality. The object of this Bill is to enable plumbers, if they so please to become, registered, and by means of a penalty to prevent those not duly qualified from describing themselves as registered. As it is not obligatory and confers no privilege on plumbers who register themselves, the efficiency of the measure will rest with the public themselves. The Bill provides for the Constitution of the Plumbers' Registration Council, in the first instance by the Local Government Board; the Council to have power to frame schemes generally, and to determine the qualifications for registration, and to have certain disciplinary powers over registered plumbers. Schemes framed by this Council have no validity until confirmed by the Local Government Board, after consultation with the Local Government Boards for Scotland and Ireland. Any scheme so confirmed has to be laid before both Houses of Parliament, and can be annulled either in whole or in part if either House presents an address within a certain period requiring the same. The date on which the register has to come into force is to be fixed by the Council.

The Home Office and Acetylene Generators.

ON Monday last the Report of the Committee on Acetylene Generators appointed by the Department of his Majesty's Inspectors of Explosives was issued as a Parliamentary paper. The Committee is of opinion that no generator should be considered safe unless it complies with the following conditions:—1. The temperature in any part of the generator, when it is run at the maximum rate for which it is designed, for a prolonged period, should not exceed 130 deg. C. 2. The generator should yield not less than 4·5 cubic ft. of gas from every pound of calcium carbide (capable of yielding 5 cubic ft. of gas) used. 3. The size of the pipes carrying the gas should be proportioned to the maximum rate of generation. 4. The carbide should be completely decomposed in the generator, so that the sludge discharged shall not be capable of generating more gas. 5. The pressure in any part of the apparatus on the generator side of the gasholder should not exceed 20 in. of water, and on the service side of the holder, or where no holder is provided, should not exceed 5 in. of water. 6. The apparatus should give no tarry or other heavy condensation products from the decomposition of the carbide. 7. Regard should be had to the danger of stoppage of passage of the gas and resulting increase of pressure which may arise from the freezing of the water. Steps should be taken to prevent the possibility of freezing. 8. No lime sludge should be able to gain access to any pipes intended for the passage of gas or circulation of water. 9. Glass gauges should be avoided when possible, and, where necessary, should be protected. 10. The air space in the generator should be as small as possible. 11. The use of copper should be avoided in such parts of the apparatus as are liable to come in contact with acetylene. This list of conditions appears somewhat formidable, but merely enumerates the principal defects liable to occur in faulty generators. There are several generators on the market which meet all the requirements of the Committee. Architects or builders interested in the erection of acetylene generators would do well to consult the Report itself, since it contains much useful information which we cannot afford space to discuss in these columns.

Radio-Active Bodies.

ON Friday evening last week, Professor H. Becquerel, the discoverer of the Becquerel rays, gave a discourse on "Radio-Active Bodies" at the Royal Institution. He began by pointing out the mysterious nature of the radiations given out by these bodies, and that the study of them opened out a fruitful field for physical research. The discovery by M. and Mme. Curie of radium, a substance whose ray-activity was hundreds of times greater than that of the ordinary thorium compounds, or even of uranium, had greatly simplified the study of these radiations. He exhibited a radium compound, which was not only powerfully phosphorescent, but when brought near a fluorescent screen, made it luminous, thus actually showing that it was emitting radiations in all directions. This phenomenon seems to show that radium rays have a resemblance to ultra-violet rays. Professor Becquerel also proved by a very simple experiment that these rays discharge electrified bodies. An ordinary gold leaf electroscope was strongly electrified so that the leaves diverged at a considerable angle. When a small piece of radium contained in a glass tube was brought close to the electroscope the leaves immediately fell together, showing that they had lost their charge. In another even more striking experiment he showed that these radiations greatly diminish the resistance of the air to electric discharges. He arranged a divided circuit in the secondary circuit of an induction coil so that there were two air gaps sparking simultaneously. Bringing a piece of radium within a foot of either spark gap caused the other to cease sparking and consequently increased the brilliancy of the sparks next the radium. Professor Becquerel divided radium radiations into three different kinds. The first kind was deflected by a magnet; the second kind was not deflected by a magnet, but was readily

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absorbed by various substances; and the third kind was weaker and more diffused, and was probably due to secondary rays. In conclusion, he described his experiments on the secondary radio-activity of metals. Although the interest of radio-active bodies is at present mainly theoretical, yet it seems to us highly probable that they will in the near future be found of great value in chemical and electrical applications, such as colour photography, the measurement of magnetic fields, &c.

Some Electrical Developments.

IN the fourth of his course of lectures at the Royal Institution, Lord Rayleigh began by explaining how Weber's hypothesis that the molecules of a piece of iron are already magnetised, but are lying about in all directions indifferently, and so do not produce any magnetic effect as a whole, is in close agreement with all the observed phenomena. Professor Ewing has illustrated this by a model which shows clearly why magnetism is not proportional to the magnetising force, and how the friction of the molecules causes magnetic hysteresis. Some pretty experiments, due to Professor Elihu Thomson, were shown to illustrate electro-magnetic induction through space. When a coil of wire with its ends attached to a miniature lamp was brought near an electro-magnet, the lamp lit up. Inserting a plate of glass between the magnet and the coil had no effect, but a thick sheet of copper screened off most of the magnetism and caused the lamp to burn dimly. When a ring of aluminium was placed over the magnet and the current turned on, the ring was repelled several feet high by the magnetic repulsion. The lecturer next considered the mechanical effects of electrical currents, and stated that the general tendency of the mechanical forces is to make the self-induction of the circuit a maximum. This theorem, which we believe is due to Lord Rayleigh himself, is little known amongst electrical engineers, but is a most valuable one, as by its means all the various attractions and repulsions of electric circuits are reduced to one law. Barlow's wheel was exhibited—the principle of which is used in all electric meters which have a disc rotating on mercury—and its action explained by the attempt of the circuit to assume a state of maximum self-induction. He mentioned also how the method is used in Lorentz's apparatus for determining the unit of electrical resistance in absolute measure, and referred to his own experiments to determine this twenty years ago. Professor Viriamu Jones's modification of this apparatus has been set up at Bushy House, and it was intended to make further experiments by this method. Lord Rayleigh suggested that it would be useful in measuring the very small resistances which shunt ammeters for reading very high currents. We fail, however, to see how it could be applied for this purpose, as, even if possible, it would be exceedingly difficult to eliminate the resistances of the points of contact. In conclusion the lecturer praised the Kelvin balance, and stated that he was doubtful about the permanency of the magnetism in the Weston instruments.

Bridges on the Upper Thames.

LAST week a *résumé* was given in these columns of a lecture on the subject of the architectural treatment of bridges by the editor of this journal. An opportunity for the proper treatment of a bridge on the Upper Thames appears already to have arisen, since it is, it seems, necessary to erect a new bridge over the Thames between Whitchurch and Pangbourne. Such a bridge should be essentially simple, but at the same time in harmony with its charming natural surroundings. Whether this object will be attained, remains to be seen. The architecture of the Upper Thames, in seeking after the picturesque, has too often become exaggerated, and wanting in truth and simplicity. The more simple a riverside cottage is, the better it harmonises with the woods and water; protruding gables and recessed doorways do not necessarily make a really artistic house. In the same way an attempt to treat a bridge "picturesquely" will probably result in a lamentable failure. It is probable that in no long time a new bridge will have to be built between Goring and Streatley, then another opportunity will occur. We wish that the local authorities could see their way to build stone bridges, but we are afraid that iron is sure to be the material used.

Boiler Explosions.

THE report on the working of the Boiler Explosions Acts for the year ended June 30, 1901, has just been issued, and furnishes less unpleasant reading for architects and heating engineers than many of its predecessors. The only explosion recorded in connexion with a warming apparatus occurred in a chapel at Heywood in October, 1900, and as no one was injured, a preliminary inquiry only was held. The facts elicited at the inquiry were that the inner tube of the annular vertical boiler, which was only two years old, gave way on account of over-pressure, which was probably caused by the negligence of the attendant. Not a single explosion due to frost is mentioned. We doubt whether the next annual report will be as favourable.

A Newspaper Storage at Hendon.

THE Trustees of the British Museum expect shortly to be provided with a depôt for the storage of newspapers at Hendon, in respect of which a sum of 3,000*l.* on account is set down in the Estimates for the next ensuing financial year. Although negotiations have been entered into for the gradual acquisition of the houses which now surround the British Museum on the north, west, and east sides, it is found that further and separate accommodation is needed to meet the influx of newspapers, amounting to an average of about 750 each weekday. The scheme contemplates the building of a storehouse at Hendon for a stock of the provincial, colonial, and other newspapers that are only occasionally required, and the establishment of a staff of messengers who will carry the bound volumes to and fro for readers at the Museum. It is stated that a site of 6 acres has been bought for the new buildings at the Hyde, Hendon.

An Exhibition of Statuettes.

THERE could be no more fascinating kind of art exhibition than one consisting of statuettes by some of the best sculptors of the day, such as that which has for the first time been arranged by the Fine Art Society at their Gallery in New Bond-street. It is curious, as Mr. Spielmann remarks in his preface to the catalogue, that it is so seldom that we see an exhibition of sculpture only, yet it is the most interesting and intellectual of the arts, and we quite agree that "there is no more convincing sign of a fine taste than a love and appreciation of sculpture." The greater proportion of exhibits are English work, with a few examples of French artists. The French works shown do not surpass any of the English work except, perhaps, in one point—individual and characteristic expression in the heads. This may be carried too far, no doubt, so as to disturb the repose and generalisation of the figure proper to sculpture; but English sculpture as a rule rather errs in the other direction. M. Pernot's "La Sensitive" (57) and M Hippolyte Lefebvre's "Mignon" (78) are notable examples of expressive treatment; the "Mignon" especially. M. Puech's marble figure, "La Source" (48) is exquisitely graceful, but the head is surely very small. Perhaps the most remarkable of the French contributions is M. Bartholomé's nude figure of a "Jeune Fille Pleurant" (64), leaning forward on a stone or pedestal with her face buried in her hands; a fine work both in a sculptural and poetic sense. Among the English exhibits is the late Mr. Harry Bates's fine basrelief "Homer" (69), and several bronze statuettes by Mr. Gilbert, all of them full of character, but all with a tendency to over-thin and "leggy" proportions; this is especially the case in the one called "Offering to Hymen" (39) in which the figure looks perfectly starved. Mr. Frampton exhibits his gilt and enamelled "St. George" on an agate globe (3), which was before seen in the New Gallery; a decorative treatment of statuette sculpture which is getting rather a fashion, and is capable of very pretty effect, but is a less intellectual form of art than the *pure marble* or bronze figure depending only on modelling and conception for its effect. Among exhibits of a special character the small studies of a "Drinking Lioness" (58), and a "Leopardess Eating" (59), by Mr. J. M. Swan, are quite admirable. One or two designs for knockers (31, 31A) are unsatisfactory because, as usual in knocker designs, there is no special treatment of the design with a view to use as a knocker. Mr. Alexander Fisher exhibits a frame of enamelled jewellery, and silver and enamel casket, which, though very interesting, scarcely come properly into the programme of the exhibition; we may observe that in the silver casket what may be called the structural design is very weak, though the general effect is graceful. There is much more in the exhibition than we have had space to notice; it is one that our readers should not miss.

Society of Painter-Etchers.

THE twentieth annual exhibition of the Society of Painter-Etchers and Engravers at the rooms of the Society of Water-colour Painters, is a very good one, and we are glad to notice that there seems to be a greater prevalence than there used recently to be of genuine line etching, and less of the other methods which are grouped under the name of etching, but which consist to a great extent in making artificial grounds and rubbing them out. The real life of etching lies in showing what free line can express. Among works of this class are Mr. Goff's "Old Shoreham" and "Chelsea" (6, 7), several of Miss Constance Pott's; Mr. Eversheds's delicate study of shipping at

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"The Gindecca, Venice" (130); and a good many others which show the true qualities of etching. Mr. Haig's "Amiens" (26) and "Cefalú Cathedral" (28) have more the character of engravings than etchings; we prefer to either his small delicate etching of the north porch of Burgos Cathedral (30). Mr. Strang exhibits several powerful, strange, and mostly very ugly studies or scenes illustrated by blank verse quotations of which the authorship is not given; another one, "The Women at the Cross" (76) is really revolting in the manner in which the figure of the Saviour is treated. Among other things may be mentioned Mr. Van Raalte's study of the interior of a carpenter's shop, under the title "The Band Saw" (106); two or three beautiful mezzotint landscapes by Mr. Joseph Knight, especially No. 118, which is the perfection of mezzotint effect; four very good etchings by Mr. E. M. Synge; a curious and effective silhouette view of "The Trocadéro, Paris" (64), by M. Béjot; and two admirable dry-point figure studies by Mr. Slocombe, though it is rather too bad to give the title of "Andromeda" to a realistic study of a very commonplace model. A good many bookplates are exhibited, of which those by Mr. C. W. Sherborn (110, 111) may be cited as examples of what bookplates ought to be, and three by Miss Bertha Gorst (126) as what they should not be. Bookplates should be conventional decorative design, not landscapes, or other pictorial representations. The special feature of the exhibition is a fine collection of mezzotints by Turner, one or two of which show effects of lightning of wonderful truth and vividness—the lightning almost seems to flash in them. Twelve of the "Liber Studiorum" plates are also included.

Women's International Art Club.

FOR its third annual exhibition the Women's International Art Club has selected the Grafton Gallery, a larger gallery than it has previously attempted to fill, but we doubt the wisdom of thus extending its boundaries. The large room contains a good many very bad oil paintings, some so bad that it is difficult to understand how they came to be exhibited anywhere. An exception is "The Procession" (106) by Miss Lancaster Lucas, which secured an "honourable mention" in Paris, and is a work quite above the average of its companions in the same room. The real interest in the large room is the collection of Miss E. M. Rope's charming bas-reliefs on the daïs, especially "The Sea Chase," a beautiful decorative treatment of line and movement in sculpture. She exhibits also a triptych, "Adoration," in the style of coloured relief which Mr. Anning Bell has been mainly instrumental in introducing. A little "Study of a Child" on left of the screen is charming. The best of the pictorial work is in the inner gallery. Among these Mrs. Deric Hardy's "Rest, Rest" (114), a lifesize oil-sketch of a mother and child, is a beautiful work. Among the smaller works here are four landscapes by Miss Evelyn Howard (132 to 135); an excellent picture of "The Quay, Ely" (154), by Miss Rose Barton; two or three charming little landscapes by Miss Catherine Howard, of which "On the Road to the Sea" (158) is an exceptionally fine composition; a cat picture by Miss F. Fairman which pretty nearly rivals Mme. Ronner; a good landscape by Miss Wright, "Flatford Mill" (243); and a very expressive half-length study of a girl, "Little Patience" (244), by Mrs. Field. In the octagon room may be noticed a landscape by Miss Mary Barton (25); two powerful landscape sketches by Miss F. Molony (44, 45), and a good life-size portrait of a Lady by Miss Gwenny Griffiths. Miss Sara Stanley, who paints architectural subjects, has missed the character of the arcade in the Ducal Palace (34), which depends to a great extent on the diminution of the columns, which are here represented as the same size from top to bottom, and one of them is perceptibly thinner than its neighbours; but painters of both sexes are apt to make many oversights in architectural detail.

The London Sketch Club.

THE eighth exhibition of the London Sketch Club, at 175, Bond-street, is a rather mixed one, containing some very good examples of powerfully sketched effects, and a good many things that are not very interesting. Among those that represent the best ideal of what sketching should be are Mr. Macandrew's "A Hillside" (12); Mr. Hobson's "Norfolk Broads" (16); Mr. Lenfesty's "Clouds" (23); Mr. Walter Fowler's "On the Sands," with a grand indication of sky; Mr. C. Haité's "Clouds" (51); Mr. Hobson's "Solitude" (53); Mr. Dudley Hardy's "Low Tide" (66); and the same artist's "Return of the Boats" (115).

The Goupil Gallery.

THE spring exhibition at the Goupil Gallery offers a fine and interesting collection of pictures, chiefly landscape, of the school which is in general more specially represented at this gallery than elsewhere in London. Among these is a tolerably large landscape by M. Jacque, "The Flock Drinking," which is a work of great power and breadth of style, and has about it a good deal of the quality of Diaz. A perfectly beautiful Corot, "L'Etang de Mortefontaine," hangs in the centre of one wall. Three examples of the work of M. Harpignies, though small in scale, show the quality of a great landscape-painter; the little work called "The Lake" especially. Two pastels by M. Lhermitte are fine examples of his work; there is a sheep picture by Mauve marked by the peculiarity that the sheep for once are heading towards the foreground instead of away from it; and there is a Meissonier, "The Smoker," not quite at his best, but still a Meissonier. Among other works are a fine though melancholy landscape by Herr Weiss, "A Grey Day"; an interior with a very pleasing figure, "The Young Seamstress," by Herr Neuhuys; a study of evening effect by Mr. Thaulow; a fine landscape by Mr. Mark Fisher, "Sunny Afternoon"; a small landscape by Mr. Thaulow, "La Rivière," in which he seems to be rather emulating Mr. Fisher's effects; and two sketches by Mr. Brabazon, "Lago Maggiore" and "On the Quay," which are better, because better drawn, than many of the amorphous colour-blottings by this amateur artist which it seems to be fashionable to admire. There is an example of Diaz down in the catalogue, but unfortunately the work had not arrived. There are one or two things in the collection which are dingy and to our thinking repellent in style; but it is an exhibition with nothing commonplace in it.

THE WHITWORTH HALL, OWENS COLLEGE, MANCHESTER.

ON Wednesday the Governors, teaching-staff, and students of Owens College celebrated (a year too late) the first jubilee of the institution. It was in 1846 that John Owens died, leaving a sum of nearly 100,000*l.* for the foundation of a Manchester college which should be free from the religious tests which were at that time so unhappy a feature of the older universities; but it was not until the spring of 1851 that the work of teaching was begun. The jubilee ought therefore to have been celebrated last year, but at that time the Whitworth Hall, of which the foundation-stone was laid in June, 1898, was not completed, and it was decided to combine the jubilee celebrations and the formal opening of the hall a year later. With the nature of the ceremonies we have little to do. Suffice it to say that his Royal Highness the Prince of Wales delivered a well-written address, in which he regretted the absence of the distinguished architect of the building—a regret which every architect echoes—and finally declared the hall open; that the Duke of Devonshire, President of the College, presided at the opening ceremony; that learned men from other universities attended, some to speak and some to listen; and that Manchester did its best to hide the prevailing grime of its buildings by Venetian masts, bunting, and festoons of evergreens and paper flowers.

The new hall, as the foundation-stone declares, has been given to Owens College "by Richard Copley Christie, Esq., in memory of Sir Joseph Whitworth, Bart." It stands to the left of the principal tower of the group of buildings, and completes the Oxford-street front. The extreme end is towards Burlington-street, and a new corridor connects the hall to the Christie Library, which abuts on the same street in the rear of the new building, and which was opened four years ago. The Whitworth Hall, the Christie Library, and the older buildings of the college have been designed by Mr. Alfred Waterhouse, R.A., and although the work has been spread over about thirty years, there is a general similarity in the treatment. The style is of the variety commonly known as Domestic Gothic—more domestic, indeed, than that adopted by the same architect in the Manchester Town Hall. The walls are faced with stone, laid (as in the Town Hall) in courses alternately deep and shallow—about 9 in. and 3 in.—and the roofs are covered with red tiles.

The new Whitworth Hall is a two-storied building, the hall itself forming the upper story. Externally, the principal frontage is towards Oxford-street, and is a dignified piece of work. The original carriage entrance to the quadrangle is in the ground story of the tower, but as it has been proved to be somewhat narrow, a new and wider entrance has been formed between the tower and the new hall, but set back a few feet from the main building line. A wide semicircular arch on the ground story is surmounted by a steep-pitched gable, containing three lancet windows, and flanked by sturdy octagonal turrets with sunk panels and pinnacles. On each side of this central feature there is a short recessed portion connecting it to the tower on the right and the hall on the left. This entrance group is one of the happiest bits of the external design.

The angle of the hall nearest to the carriage entrance is cut off at an angle of 45 deg., and a single-light window is placed in a narrow bay between the splayed angle and the first buttress. Then follow five bays, each containing a pair of segmental-headed windows in the ground story, and a pair of lofty pointed windows above, with cinquefoiled cusping to the arched heads and to the arches under the transomes. The buttresses are rectangular up to the level of the upper window-heads, and are then splayed to a semi-octagonal plan, and carried 4 or 5 ft. above the parapet, where they terminate—in a not altogether happy manner—with flat tops. The parapet has a considerable projection, the corbel-course being an interesting feature, and containing a band of carving—almost the only stone carving in the whole of the building. A moulded string-course runs under the sills of the first-floor windows, and another at some distance below, both being carried around the buttresses; in the main wall between these strings is a band of shallow panels with arched and cusped heads. The seventh bay is marked

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by a projecting porch, forming on the ground floor the principal entrance to the hall. The arched doorway is surmounted by a panelled gable, behind which a second gable rises flanked by octagonal turrets and pinnacles, the apex of the gable being level with the top of the corbel-course under the parapet of the main building. The story over the porch, we may say in passing, forms the landing from which two small galleries at the south end of the hall are entered; a similar landing, but differently treated externally, is planned on the opposite side facing the Christie Library. The eighth and last bay of the hall on each side is marked by a tower in which the stairs to the hall and galleries are placed. To afford space for the winding stairs in each tower a two-storied oriel of segmental plan is projected from the side wall and terminates below the uppermost square stage of the tower; the parapets of the oriels are disproportionately low.

The end of the hall facing Burlington-street is not by any means as satisfactory as the Oxford-street front. The designer has been confronted with the same difficulty which chapel architects have so often to face, and we cannot say that he has been entirely successful in his treatment of it. The wide gable end of the hall has been divided into a large central portion and two smaller side portions by means of two buttresses, square for the first story and semi-octagonal above, and the whole has been flanked by slightly projecting towers, the square portions of which terminate a little above the parapet of the main roof. The central portion of the gable end has a group of four windows with segmental heads on the lower story, and a large six-light traceried window above of ordinary Perpendicular design, and sadly lacking in depth. The apex of the gable is panelled, and the octagonal buttresses are finished with flat tops. The side portions of the gable end are absolutely unrelieved from base to coping, and the regular alternation of 9-in. and 3-in. courses throughout this height gives a rigid, cast-iron appearance which is far from pleasing. The towers are alike, with the exception of the doorway in the lowest stage of that to the left. With this exception, they are of plain masonry (in alternating courses as the rest of the work) up to the middle of the height of the large window in the gable, the only relief being obtained by a pair of string-courses and a coat of arms. The formal effect is accentuated by the octagonal buttresses at the angles of the towers rising unbroken from the base, and with the faces flush with the faces of the parapets. The uppermost square stage of each tower has three lancet windows on each of the two exposed faces, with detached arcades in front; a single light of similar design might with advantage have been placed in each return towards the gable. This stage is followed by a double corbel-course and a parapet with pointed arches simply chamfered. Behind the parapet there rises an octagonal stage—again reminiscent of the Manchester Town Hall—with a pointed arch in each face, and surmounted by an octagonal spire covered with lead, the rolls arranged in zigzag pattern. The shallowness of the windows in the gable end, the cast-iron regularity of the masonry, the straight lines of the octagonal buttresses, and the large unrelieved masses detract very much from the success of this portion of the exterior.

The entrance hall and staircase occupy two bays of the ground floor at the Burlington-street end of the building. The style here is Romanesque, round arches carried by unpolished grey granite columns on lofty stilted bases. The ceiling of the hall is flat, and a small plaster cornice is run around it in such a way as to cover the upper parts of the central voussoirs; the effect is one of weakness. A wide flight of four steps rises from the hall to a landing under the ground-story window of the gable end, and from this landing flights of stairs rise (right and left) to the two towers. Other flights lead from these to the floor of the hall, and others are continued up the towers to the level of the galleries.

The hall itself is a simple parallelogram about 50 ft. wide and 130 ft. long, and bears evidence of a study of Westminster Hall. It has an open timber roof with seven main hammer-beam trusses, and smaller intermediate trusses. Each main truss has a pair of curved principal ribs, cutting through the hammer-beams and meeting in the centre of the span to form a pointed arch. Other timbers, springing from the ends of the hammer-beams, are framed vertically between the trusses to form two series of semicircular arches from end to end of the hall. The panels of the trusses are filled with vertical bars connected at the top by cusped arches. The ends of the hammer-beams carry carved eagles, and are connected by tie-rods—a wise precaution—and the feet of the trusses rest on heavily-moulded, bell-shaped capitals, each of which is supported by an unpolished shaft of grey granite standing clear of the wall.

At the Burlington-street end the first bay is occupied by six stages rising in steps from the floor of the hall, and the principal entrances are placed in the second bay. Small triangular galleries are carried across the angles at this end, and other small galleries project over the entrance doorways. At the opposite end of the hall are two other entrances, approached (by a corridor over the new quadrangle gateway) from the principal staircase of the older building. These staircases are placed near the side walls of the hall on either side of the platform; passages are formed from the doors to the hall by means of glazed screens, in which folding doors are placed to give access to the platform, and flights of seven steps lead down from the passages to the hall. Above these passages, and above the transverse corridor behind the platform a ⌐-shaped gallery is constructed, and a large organ, occupying about three-fourths of the width of the hall, is placed in the back portion. The platform is thus enclosed on three sides. The gallery and screens are of oak, and appear somewhat flimsy in contrast with the massive roof-timbers. The curfew panelling is too shallow for good effect, and the wood arches at the inner ends of the passages are particularly weak.

The hall is lined with oak panelling to the height of above 10 ft., and above this with ashlar in regular alternating courses similar to the exterior. The acoustic properties of the hall are perfect, both for speech and music, and this is a very valuable quality in a building of this kind.

On the ground floor a central corridor about 10 ft. wide runs longitudinally from the principal entrance hall at the Burlington-street end to a smaller hall entered from the new carriage archway. Offices for the college staff and other rooms are provided on either side, including a kitchen and pantry for festivals of a less intellectual character than those for which the hall is primarily intended.

We have said enough to show that the Whitworth Hall is an important addition to the buildings of Owens College. Although we are no purists, we do not admire the staring incongruities displayed in different parts of the structure, but the Oxford-street frontage is undoubtedly a great improvement on the earlier portion of the college in that street; and if we except the principal staircase of the older building, we can endorse the eulogium passed on the new hall by one of our Manchester contemporaries, which describes it as "a piece of architecture into which its author has put the happiest invention shown in any of his work for the Owens College." We must confess, however, to a little sympathy with the "Undistinguished Student," who, in another Manchester paper, writes:—"The buildings of the college never charmed me. Indeed, I felt them cold and forbidding. And I still feel them so. They are utilitarian Gothic, which is a modern addition to the seven deadly sins." This is strong language, and the writer of it would probably have been converted to a different opinion if every part of the college buildings had been as happily conceived as the Oxford-street front of the new Whitworth Hall and quadrangle entrance.

THE LATE MR. BENTLEY.—Mr. J. H. Eastwood, the architect for the new Roman Catholic Cathedral at Leeds, writes to correct an error in our obituary notice of Mr. J. H. Bentley. It was for the old or present cathedral of St. Anne's, Leeds, that Mr. Bentley prepared the decoration scheme; not for the building now in course of erection from Mr. Eastwood's design.

DULWICH COLLEGE.—It is stated that Mr. Edwin T. Hall has prepared plans for the erection of a school library at Dulwich College, at an estimated cost of 3,000*l.* for the fabric, which it is intended shall form a memorial to "old Alleynians" who have fallen in the course of the South African war. The new buildings for the school, opened in 1870, were erected after plans and designs by the late Mr. Charles Barry.

THE ARCHITECTURAL ASSOCIATION.

AN ordinary fortnightly meeting of the Architectural Association was held in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., on Friday last week, Mr. W. H. Seth-Smith, President, in the chair.

The minutes of the last meeting were read and confirmed, and the following gentlemen were elected members of the Association:—Messrs. S. Leaning, E. G. Besant, R. O. Constant, F. F. B. Pittar, and B. Procter.

On the motion of Mr. H. P. G. Maule, Hon. Secretary, a vote of thanks was accorded to Mr. Aston Webb, A.R.A., for allowing members to visit on the 15th ult. the Royal College of Science and Victoria and Albert Museum, South Kensington, and for conducting the party on the occasion.

The Chairman said he desired to propose a vote of thanks to the Pearce Portland Stone Co. for presenting to the day school seven cubical blocks from the different beds of Portland stone formation, and to Mr. A. Brumwell Thomas, through whose kind offices they were obtained, and who had also presented some fossils.

This having been agreed to, it was announced that a meeting of the Discussion Section would be held on the 14th inst., when a paper on "Co-operative Homes" would be read by Mr. H. C. Lander.

The Late Mr. Bentley.

The Chairman said he should like to propose a vote of condolence to the family of the late Mr. J. F. Bentley. It was proposed to send a letter on behalf of the Association expressing their sincere condolence, and saying how much the Association appreciated Mr. Bentley's kindness in allowing members to see his splendid work at Westminster, and in promising to let them view it again shortly, and expressing their admiration for his work generally.

The Chairman's motion was agreed to unanimously.

New Premises Fund.

The Chairman said that since their last meeting they had received several additions to the New Premises Fund. The amount previously announced was 3,710*l.*, and the total was now 3,923*l.* 15*s.* 6*d.* The additions were:—Messrs. W. H. Seth-Smith, 50*l.* (second donation, making 100*l.*); H. Muff, 10*l.* 10*s.*; J. Oldrid Scott, 10*l.* 10*s.*; G. Sherrin, 10*l.* 10*s.*; L. A. Shuffrey, 10*l.*; W. Hilton Nash, 5*l.*; E. B. Muff, 2*l.* 2*s.*; and F. Frank Green, 2*l.* 2*s.*; also 13*l.* from the Architectural Association Day School students, and a provisional promise of 100*l.* from Mr. Rowland Plumbe.

The Chairman said it was particularly gratifying that the day students, who were comparatively new to the Association and its work and interests, should, quite independently, have contributed to the fund.

Mr. R. S. Balfour, Hon. Secretary, announced the following donations to the Library: "Conditions of Contract," by Mr. F. W. Macey, presented by the publisher, Mr. B. T. Batsford, and "The Royal Pavilion at the Paris Exhibition," by Isidore Spielmann, presented by the Royal Commission, Paris Exhibition. He proposed a vote of thanks to the donors, which was agreed to.

The Glasgow International Exhibition Buildings, 1901.

The Chairman then called on Mr. J. Miller to read the following paper on the "Glasgow Exhibition Buildings of 1901":—

In dealing with this paper, before proceeding to describe the buildings in detail, I shall refer briefly to the purposes and scope of the undertaking, and also to the site and its surroundings.

The object of the Glasgow Exhibition, as defined in the official catalogue, was to exhibit the manufactures, products, industries, and material resources of all nations, the machinery and appliances relating thereto, and to present a full illustration of the progress in industry, science, and art during the nineteenth century.

While the undertaking might be called International, inasmuch as most foreign countries were, to some extent, represented, it was not a National undertaking in the same sense as the Great World's Show at Chicago, or the various exhibitions that have been held in Paris. In its inception and development it was entirely local, and with the exception of

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the buildings erected by Russia and the minor pavilions of Canada and Ireland, and several private exhibits, the whole of the buildings were erected by the local Exhibition authorities, without any state or outside aid whatever.

With exhibition buildings, as with all buildings, the site is a most important factor in determining the arrangement and design of the scheme. For you can at once understand, when a large area of ground is to be overlaid with a number of buildings, it is of the utmost importance that every advantage should be taken of the site and its natural surroundings, both as regards the design and disposition of the buildings, in order to obtain the best result from a spectacular point of view, not of one building only, but of the whole, and at the same time give the most convenient and suitable arrangement for exhibition purposes.

In Chicago and the several Paris Exhibitions, which have been held from time to time, the symmetrical or axial plan has been adopted, and I think there can be no question that wherever it is possible to produce a plan on axial lines, it is the finest and grandest form. In Glasgow, however, the site at the disposal of the exhibition authorities was somewhat different from those to which I have referred. Kelvingrove Park contains about eighty acres, at least that part of it which was available for exhibition purposes. Through its centre winds the river Kelvin in serpentine curves, and on its north and north-east sides are ranges of high and steep slopes, crowned, in the former case by the University buildings designed by the late Sir George Gilbert Scott, while the latter is surmounted by fashionable terraces, well designed and appropriate to their position. Viewed from the front of the main Exhibition buildings, these features formed a fine, and, in fact imposing background to the various temporary buildings scattered throughout the grounds.

A leading feature in determining the general arrangement of the buildings was the position of the new permanent Art Galleries, which have been erected on the south bank of the river, directly facing the University buildings. The only large open piece of ground in the park lay between the Art Galleries and the east boundary of the park at Gray-street, running parallel with Dumbarton-road, which formed its south boundary. The extent of this ground was about 800 ft. long by 400 ft. wide. There was no alternative but to place the largest and most important building here, namely, the Industrial Hall, having its principal front facing the river.

Smaller open spaces were selected throughout the park for the less important buildings, and an endeavour was made as far as possible to arrange these somewhat in the form of a semicircle, having for its base the front line of the Industrial Hall. No buildings were introduced within this semicircle, the idea being to preserve this space as a large open area, to be used as a promenade from which uninterrupted views of the buildings might be obtained. It was my intention to have placed a great central feature here in the way of a monumental fountain 60 ft. in diameter, surrounded by a row of columns 40 ft. high, each column supporting a gilded winged figure. From the centre of the fountain rose a great circular illuminated tower 120 ft. high. Such a feature would have formed a climax to the architectural scheme, repeating, as it were, the spirit of the main features of the Industrial Hall and forming a culminating point in the centre of the grounds. This feature I regret to say was never carried out. The park is studded with fine trees, but I might mention that not a single tree was sacrificed to make room for any of the buildings, we believed it better rather to sacrifice the architectural symmetry of the scheme, than to cut down these permanent embellishments of the Park, remembering that the life of our exhibition was only to be six months.

I would here point out that many of the smaller buildings were introduced long after the original plans were matured; the growth of the Exhibition was gradual, and its ultimate extent greatly exceeded the anticipations of the executive; in fact, as time went on, the number of the buildings increased to such an extent that it was with difficulty positions could be found for them. This explains in a measure the somewhat irregular arrangement in certain parts of the grounds. Had the full extent and scope of the scheme been approximately known at the beginning, more might have been made of it from an architectural point of view, but in any case the site was such as would not admit of anything of the nature of a symmetrical or axial arrangement of plan.

Having thus roughly outlined the principal features of the site, I will now proceed to describe the buildings in detail. The buildings may be divided into five groups, namely, first, Industrial Hall; second, Machinery Hall; third, Grand Avenue; fourth, Concert Hall; fifth, the various restaurants, kiosks, and minor exhibits throughout the grounds.

I ought to mention here that the fine arts were housed in the handsome new permanent Art Gallery, recently erected from the designs of Messrs. Simpson & Allen, of London. The design and arrangement of this building are, no doubt, already known to you; it is not my intention, therefore, to deal with it in this paper; but will confine my remarks to those structures designed by myself, and carried out under my direction.

The Industrial Hall was 690 ft. long by 327 ft. in width; its chief features were the great dome with its towers, peristyle, and piazza. The building might be termed cruciform on plan, the dome being formed at the intersection of the main central avenue with the two short cross avenues leading to the main street entrance in Sandyford-street, and to the ceremonial entrance and piazza respectively. The dome had an internal diameter of 72 ft. and the height from the floor to the underside of the lantern was 131 ft. The extreme height from the ground line in front of the peristyle steps to the top of the flying figure on the summit of the lantern being 200 ft.

The dome rises from piers formed of timber, and covered with fibrous plaster; between these spring the four arches under the dome, forming the pendentives. These arches have a width of 49 ft., and are 44 ft. 6 in. high to the crown. They are treated in a broad and simple manner, without any arch mouldings whatever, the pendentives being allowed simply to melt into the extrados of the arches, a form of treatment which suited the plastic material used in the construction, no attempt being made to represent or imitate a stone treatment. The interior of the dome was formed without ribs or divisions of any kind, thus forming an uninterrupted hemisphere. The effect produced by this treatment, to my mind, is to give a dome a feeling of mystery and lightness, it seems to hang or float in the air. Vertical ribs may tend to give apparent height, but with these the construction at once becomes apparent, and the aerial mystery is lost.

The pendentives were enriched by large figure groups, in high relief, symbolical of navigation. These groups filled the entire spandrils, without any framing-in, the extreme size of the spandrils being 50 ft. broad by 30 ft. high. More variety and interest would have been given had the four spandrils been treated with different groups, but want of money and shortness of time prevented this being done.

The piers carrying the dome were constructed of wood up to the level of the external platform, 60 ft. from the floor, the dome itself being formed of steel ribs placed at about 14 ft. centres, connected at top with a braced steel ring of sufficient weight and strength to carry the fleche. Between each of the steel ribs were placed three ribs constructed of wood, 2 ft. 6 in. deep, at about 4 ft. 6 in. centres, with wood purlins connecting the same at exterior and interior, and cut to the curve of dome. The internal surface of the dome was covered with fibre plaster moulded to the curve, and nailed to ⅛-in. boarding fixed to the purlins, the fibre plates having a finishing coat of putty lime ¼ in. thick, as on the external walls. On the outside was fixed ⅛-in. boarding, covered with a smooth surface floorcloth, this being the cheapest and most suitable material we could find to take on the gilding with which the dome was covered, materials like copper or lead being considered too expensive for temporary work. As for the gilding with which the domes and turrets were covered, various materials were experimented with. Real gold leaf was beyond the purse of the committee, and various lacquers and imitation gold leaf were tried, but these soon became black in the chemically charged atmosphere of Glasgow. After various experiments we found the most satisfactory material to be aluminium leaf covered with a yellow lacquer, which gave an effect resembling real gold at about 1s. 10d. per square yard, but even this as a lasting material fell far short of the real article. The effect of aluminium leaf itself was exceedingly good; it gave a fine metallic lustre to the rounded shapes of the roofs and lasts well.

The four great towers surrounding the dome were constructed of wood. The corner posts were of pitch pine, 12 in. by 12 in., rising from a framework formed on top of a solid bed of concrete to which it was securely bolted. The posts were scarfed at the joinings and bolted together; to each of the posts were bolted two 12-in. by 6-in. runners, the intermediate vertical pieces, being 12 in. by 2½ in. The whole framework was braced on the four outside faces by means of two layers of timber sheeting ⅞ in. thick, placed close together diagonally, the outer layer being laid to the opposite angle from the one below. By this means perfect rigidity was given to the towers, and a solid surface formed on which to nail the fibre plaster boards. The four towers were in their turn bound together by the four walls forming the square enclosure, out of which the dome rose. These side walls were constructed of wood, the uprights being 12 in. by 2½ in., and the method of bracing was similar to that already described for the towers.

The outer walls of the main building were formed of 4 in. by 2 in. uprights at 2 ft. centres, braced with 4 in. by 2 in. pieces. The whole of the outer surfaces of the walls as well as all the ornament were executed in fibrous plaster, which was cast in slabs 4 ft. by 3 ft., and nailed direct to the timber framing. For temporary purposes fibre plaster has many advantages over wood. In the first place, it is practically fireproof, a matter of the highest importance in buildings where the structural work is mostly of wood, and which are filled to overflowing with combustible materials of all kinds. Where repetition of ornament is required it has no rival, and for colour and texture it leaves nothing to be desired. The fibre boards were all cast in the workshop and were ½ in. thick, the outside surface being left rough. They were fixed, leaving a space of about ⅜ of an inch at the joinings, then the outside was entirely floated over with a finishing coat of stucco ¼ in. thick. This coating was squeezed through the joints left between the boards, and formed a key on the back similar to that formed by plaster on the back of lath. By this means the joints of the plaster work are not so liable to show after being exposed to the weather, and a stronger and more uniform surface is obtained.

The main central avenue of the Industrial Hall had a roof of steel having a clear span of 92 ft. 6 in., or 102 ft. 6 in. over the principals, and was carried through the whole length of the building, except where broken by the dome in the centre. There were seven principals on each side of the dome, spaced about 40 ft. apart, connected by longitudinal purlins, on which rested the intermediate rafters. The arched principals were of box section, and formed of eight L's 4½ in. by 3½ in. by ⅜ in. with lattice-work between, and were designed on the three-hinged system—that is, the bases of the legs of the principals were hinged by pins, 3½ in. diameter, to bed-plates secured to concrete foundations, and the bed-plates were connected horizontally by a flat steel bar, 5 in. by ½ in., to prevent the legs spreading. The principal at the apex was also joined by a hinged joint and a 4½ in. diameter pin. In its elements this type of truss is practically two girders standing on end and resting against each other at the top, where they are joined by a pin; the legs spread apart at the base and are fixed by pins to a foundation, and prevented from spreading by the steel bar, which completes the triangle of forces.

Between the lower, or column, part of the principal along both sides of the avenue were open elliptical arched girders of steel with radiating flat bars. Each of the principals was built in five parts, and erected by means of a steam crane with a 70-ft. jib mounted on a staging 30 ft. high running on wheels. There was another staging, also on wheels, behind to support the parts of the principal as they were erected. The two bottom parts, or legs, were, of course, erected first, and kept upright by forks, one side of which was movable, connected to the back staging. The two intermediate pieces were then fitted to the legs, and finally the apex in one piece with pin in position was dropped in and the whole principal bolted up.

The side roofs were arranged in spans 42 ft. wide at right angles to the main avenue. The principals were constructed of timber on the cantilever principle, and are exceptionally light

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in their scantlings, making a very cheap form of roof. They are placed at 12 ft. centres; the ties pass over the tops of the main bearing girders, are attached to the top of same, and are continuous throughout their entire length. The struts of the cantilever, formed of three 6½ in. by 2½ in. battens, rest on the bottom boom of the main girder, and are bolted to the ties at a distance of one-third the span from the main girder. The couples of the centre portion are simply 6½ in. by 2½ in. single battens, the bottoms of which rest on the points of the cantilever. Immediately over the point of the cantilever there is a light lattice timber girder, which acts as a ventilator, and also carries the ends ot the astragals of the roof and supports the ends of the corrugated sheets on the flat portion of the roof.

The main girders which carry these principals were of timber with iron ties, and had top and bottom booms formed of three thicknesses of 9 in. by 4½ in. bolted together, and having steel plates at the joinings. They were 4 ft. 6 in. deep, and were built continuous, their entire length being 113 ft. They were supported in the middle by a 10 in. by 10 in. solid post, so that the clear span on either side of this support was 56 ft. These girders were supported at their inner ends by the main principals of the central avenue, and at the outer end by supports formed in the front wall. The astragals for these roofs were T-shaped steel in one length, viz., 23 ft. long from eave to eave, bent over the ridge, and placed at 2 ft. centres, the section being 1½ in. by 1¼ in. by ¼ in. The glass was rolled plate $\frac{3}{16}$ in. thick. The glass was fixed with putty and having pins passing through the vertical members of the astragal.

The corrugated iron used was No. 24 B.W.G., not galvanised, but dipped in linseed oil, it being intended to be painted; but, whether painted or not, my experience is that all corrugated iron should be galvanised, even for temporary work which is to be painted, for, if not galvanised, the thin sheets very soon corrode. Galvanising has also the advantage of increasing the strength of the sheet, making it equal to an extra gauge in thickness; and further, if the corrugated iron is galvanised, a better price can always be obtained for it after its use on a temporary building. In designing these roofs the object kept in view was to have as few supports as possible, so as not to cut up the floor space, thereby allowing the exhibits to be arranged in any way that might be found desirable.

An important point with exhibition buildings is the lighting. While windows were formed in the side walls of all the buildings, the chief source of lighting was from the roof, and the area of glass in the roof should be sufficient to amply light the buildings, without reckoning on the windows, as the latter are as often as not covered up by exhibits or decorations. The area of glass in proportion to floor area in this and the other buildings was as 1 to 2, in other words, 50 superficial feet of glass to every 100 superficial feet of floor area, and the lighting, I may say, was satisfactory in every way.

When circumstances will permit, I think a more even and better diffused light is obtained when that part of the roof next the ridge is glazed, instead of having the roof covering here and the glazing lower down. If the roof is a very wide span a second stretch of glazing may be introduced lower down on the slope of the roof, but the largest section of glazing should be at the ridge.

It is important that glazing, *i.e.*, putty glazing, should be done in dry weather. In frosty weather it is dangerous for the workmen engaged on the roofs, and in wet weather the putty does not adhere to the astragal, leakage will result, and nothing short of taking out the glass and reglazing will make a satisfactory job. For these reasons every opportunity of dry weather should be taken advantage of to get the roofs glazed.

For an exhibition, where as a rule time is limited, the autumn preceding the exhibition year is perhaps the best time to get the glazing done. If it is not done before the winter sets in, and the weather becomes unsettled, it will be found a difficult matter to find favourable opportunities to glaze large areas between that time and the opening in May, at least that was our experience, but, of course, the winter preceding our Exhibition was an exceptionally severe one, with an abnormally high rainfall.

In very warm weather it will be necessary to size colour the glass on all roofs facing the south, otherwise the heat will render the building very uncomfortable, especially if the roofs are inclined to be low.

In most of the exhibitions that have been held in this country, the floors of the industrial section have usually been formed with battens 3 in. thick laid with a space of about ⅜ of an inch between the planks. In the Glasgow Exhibition, however, the floor of the industrial hall was laid with ordinary 1⅛ in. flooring tongued and grooved and laid close. These two methods each have their advantages and disadvantages, the former is more easily brushed and cleaned as the dust falls down between the openings left between the boards, and in the case of any fire arising under the floor its presence would at once be observed and its position located. On the other hand, paper and all sorts of rubbish are pushed down under the floor, and even lighted matches might be thrown down and ignite the material below, coins and other valuables are also liable to drop through the openings. The close boarded floor has the advantage of being much cheaper in the first instance. I say in the first instance, for almost full price can be got for the battens when sold off at the end of the exhibition. The close floor is not so easily cleaned as the open floor, as all sweepings must be collected and removed instead of being brushed through the openings in the floor, but in any case all paper and suchlike rubbish should be carried away in barrows or baskets, and not deposited below the floor. The close floor is warmer than the open one, rendering the stalls more comfortable for the attendants. On the other hand, a fire might arise beneath a close floor, and obtain a considerable hold on the floor timbers (assuming there is a space under the floor) before being discovered, and its position is more difficult to locate. Where there is a space beneath the floor it is advisable to cut the area into sections by means of brick walls carried hard up to the under side of the flooring. These walls prevent currents of air under the floor, which would tend to fan a fire, and in the event of a fire arising they help to confine it to the section in which it arises.

In large exhibition buildings, where immense crowds of people congregate, ample provision must be made in the way of entrances and exits. The exits should be distributed and arranged so as to prevent, as much as possible, congestion of traffic. In spite of this, however, it will usually be found that one or two of the exits provided come in for an extra large share of the traffic on account of their proximity to a railway station or car route. It is, therefore, important that such positions should be carefully studied on the plan, and ample provision made to meet the requirements.

The area of the Industrial Hall was 200,000 square feet, and of this space about 91,000 square feet, or less than one half, was occupied by exhibits, leaving a floor space of 109,000 square feet available for the public, so that the building when crowded would contain something like 27,000 persons. One lineal foot of exit space was allowed for every 519 square feet of clear floorage, which is equivalent to one foot of opening to every 130 persons the building was capable of containing. On many occasions the building was crowded to its utmost capacity, but the exits were found sufficient for all purposes.

The entrances are usually placed alongside the exits; these, as a rule, are the ordinary registering turnstile. The number of turnstiles used in this building was fourteen. These turnstiles are arranged to suit the various classes of visitors, namely, paying visitors, season tickets, railway and steamboat tickets, &c.; sometimes also the attendants are required to pass through turnstiles, in which case separate turnstiles must be provided for this purpose. For closing up the exits and entrances at night nothing is so convenient or more easily managed than the ordinary roller shutter of extra strong make. They are rolled down outside the turnstiles, and when opened are concealed in boxing alongside the lintel. They are easily and quickly manipulated.

Near to the principal public entrance were placed the ladies' and gentlemen's cloakrooms, each with ample lavatory accommodation, with rooms for attendants. Other large lavatories were placed at the west end of this building at its junction with the grand avenue. The number of water-closets provided in this building were thirty-four; washhand basins, thirty; urinals, fifty.

The importance of adequate lavatory accommodation in an exhibition where great crowds of people are massed together for a whole day cannot be over-estimated, and it is for this reason I give these particulars, as the accommodation here provided was considered ample. In addition to what I have given above, lavatory accommodation was provided in all the other principal buildings, and throughout the grounds, but these will be referred to later on. Near to the central entrance were the police, lost luggage, and enquiry offices. The latter should have a separate entrance direct to the outside of the building, so that people can call on business without requiring to pass through the turnstiles.

In a central position near the dome were placed the banking premises, which consisted of a telling-room, manager's private room, with cloakroom and lavatory, and strongroom. Telephone office and post office, also exhibition manager and secretary's office, with committee-room and rooms for the clerks and public office, were centrally situated, and in positions where they could be readily seen by the public. Shipping and railway offices were also placed in prominent positions. These latter need not be large, but just sufficient to contain an attendant with space for the advertisements, but the size will be regulated by the requirements of the company.

Near to the ceremonial entrance, and just at the dome, were the royal reception-rooms. These comprised outer and inner halls, dining-room, and boudoir with dressing-rooms and lavatories for ladies and gentlemen. These rooms are used for receiving Royal or other distinguished visitors who may visit the Exhibition, and are usually fitted up and furnished in a more or less luxurious manner.

An indispensable feature in connexion with the Industrial Hall was the goods yard placed at the west end. All goods were received here and unloaded, checked, and conveyed on trolleys run on rails to the respective stands throughout the hall. A goods office and weighing-machine should be provided in connexion with goods yard.

Having thus described the leading features of the industrial hall, and the necessary offices and accommodation required in connexion therewith, I will just refer to one or two points which in designing such a building it is necessary to keep prominently in view. The gutters of the main roofs should be of ample section, with good falls, and ample provision should be made for down pipes to carry the water off. In a temporary building there is always a tendency to underdo rather than overdo such matters as these, but this is a mistake, as more damage might be done by a heavy fall of rain in half an hour than all the extra cost of having proper gutters and sufficient conductors. For long straight gutters sheet-iron answers the purpose very well. It should be well bolted at the joints, with a layer of canvas dipped in red lead inserted. For flashings, dome coverings, and awkwardly shaped gutters, the best material is undoubtedly lead, say, 4 lbs. to the foot. It is more easily worked to suit the various positions and awkward corners than either sheet-iron or zinc, and although the first cost is more, it will realise about two-thirds of its original cost when the buildings are demolished, so that the ultimate figure will not be much in excess of sheet-iron or a good class of felt when the painting of these latter is taken into account.

As to the construction of the building generally, every precaution should be taken against risk of fire. Were a fire to obtain a proper hold on a building such as I have described, where a large portion of the structural work is wood, and the building filled from end to end with combustible materials, there would be but a very small chance of saving any portion of it. There are no cross divisions of any kind dividing the building into sections, these being hardly permissible in a building of this nature. You can readily imagine, therefore, the rapidity with which a fire would travel when once under weigh, and the serious consequences which would ensue. For while a building of this kind and its contents can be insured against fire risk, just as any other building can, it must be remembered that thousands of pounds have been expended on other buildings throughout the Exhibition, which are merely accompaniments to the main

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building, without which they would be worthless, so that the destruction of the main building might mean financial ruin to an Exhibition. If the amount of money proposed to be expended on the building will not permit of steel construction, then it is highly desirable that the form of wood construction adopted should be such as shall contain the least possible amount of timber. As a general rule, it is better to use larger scantlings and fewer pieces than smaller sections with numerous parts, for a fire takes a longer time to get hold of a large section of wood than it does a small one, and spreads more slowly with the former. Fibre plaster should be used for wall linings where required, and any space under the floor should be divided into sections by dwarf walls, as already described.

Fire hydrants, with sufficient lengths of hose, should be placed at intervals along the centre of the building, and the staff should be regularly drilled in the use of these. It is also advisable to have a steam fire-engine located within the grounds, and as near as possible to the main buildings. Two rooms for the fire brigade should be provided, adjoining the main building, having telephone communication with all the buildings throughout the grounds.

Machinery Hall.

This building, as the name implies, was for the purpose of displaying all kinds of machinery, motive power, electricity, and labour-saving appliances, in motion. It was situated on the Bunhouse ground, and was separated from Kelvingrove Park by Dumbarton-road, over which a bridge was thrown to connect this portion of the Exhibition with the other buildings and grounds. Its dimensions were 500 ft. long by 320 ft. wide. It was roofed by five longitudinal spans, the centre one being of steel, with a span of 92 ft. 2 in. The trusses of the side roofs were of wood, having spans of 52 ft. 8 in. These roofs had principals placed 13 ft. 10 in. apart, and were supported on timber standards placed at the face walls of the building and by the main principal of the steel centre span, the intermediate supports being formed by open braced steel girders having spans of 41 ft. 6 in., these in their turn being supported on tapered lattice columns. These columns, in addition to carrying the roof were designed to carry the shafting conveying the motive power to the machinery exhibits.

The roofs were covered with corrugated iron and glass, the area of glass being about in the same proportion to the floor area, as in the Industrial Hall. On the lower parts of the steel trusses forming the centre span were fixed cantilevers of steel, carrying a promenade gallery 15 ft. broad and 12 ft. above the main floor level. On the outer ends of these cantilevers lattice girders were carried which served the double purpose of carrying the floor of the gallery and forming the parapet or railing. These girders were 4 ft. 3 in. deep, and had a span of 41 ft. 6 in. The floor of the gallery was formed of timber joists and decking resting on the bottom flange of the girders. This gallery extended along both sides of the Central Avenue and across the ends, so that visitors were enabled to walk round the building without requiring to descend the stairs leading to the main floor level. At the north end of the hall, three flights of stairs descended to the main floor level from the level of bridge crossing Dumbarton-road, these were formed of timber and having an easy rise, the treads being 14 in. and the risers 5 in. The treads were formed of 7 in. by 2 in. timbers.

The floor of the machinery hall must necessarily be of great strength in order to withstand the heavy weights of most of the exhibits. It should rest on the solid earth after this has been levelled up and consolidated. The floor used here was 9 in. by 3 in. battens laid close together over the entire area and resting on cross runners 11 in. by 3 in. laid flat at 4 ft. centres, forming a strong and solid floor. Pipe channels are required under the floor for conducting steam and water pipes to the various exhibits. These should be formed of ample size, measuring about 3 ft. 6 in. wide and about 5 ft. deep, so as to allow space for a man to walk along and make the various connexions or repairs to pipes. Parts of the flooring should be made movable at convenient intervals to give access to the ducts. For temporary purposes, such as an exhibition, the side walls of the ducts can be formed of wood sheeting, with walings and strutts.

In arranging the exhibits, which, of course, is the work of the engineer in charge of this section, it is better to confine all those which require steam power to one section of the building, the number and lengths of ducts being thereby reduced to a minimum.

The outer walls of the Machinery Hall were formed similar to those of the Industrial Hall, that is, with wood framing covered with fibre plaster.

The ventilation of a machinery hall is of great importance. A midsummer sun streaming through the glass roofs, combined with the heat arising from the network of hot pipes throughout the building, renders the interior at times almost unbearable. Nothing short of mechanical ventilation is of any use, and a system of exhaust fans, sufficient to change the air in the building every fifteen or twenty minutes, should be provided to make the building at all comfortable in hot weather. The flooring over the ducts containing the hot pipes should also be insulated with some non-conducting material, as the boards soon become so hot as to make them uncomfortable to walk upon.

Adjoining the Machinery Hall was the boiler-house, a building 204 ft. long by 70 ft. wide. Here were placed the steam boilers for supplying power to the various machinery throughout the building. The floor of this building was 10 ft. below the floor level of Machinery Hall, but was surrounded with a gallery or promenade 10 ft. wide, running on a level with Machinery Hall floor, so that visitors were enabled to obtain a better view of the plant than they would standing on the floor of the boiler-house itself. Another advantage of the gallery being that it left the entire floor of the boiler-house free for stoking purposes. Both ends of the gallery communicated with the main hall, visitors entering at the one end and going out at the other, thereby circulating the traffic and avoiding congestion.

The boiler-house should be a lofty building and well ventilated at the roof, with doors opening to the outside at floor level, thereby causing a sufficient current of air to carry off the heat generated by so many large boilers. The height of the present building to the wall-head was 30 ft. The best material for the roof of the boiler house is corrugated iron, and this material might also be used with advantage for the walls, providing the building is not conspicuous, and an ornamental front unnecessary.

The floor, of course, should be of granolithic. As a preventive against fire, the mutual wall between the boiler-house and main hall should be of brick, carried up 3 ft. or 4 ft. above the wall head. Where it is at all possible, it is of great advantage to have a railway siding alongside the boiler-house and Machinery Hall, both as a convenient means of getting a supply of coal, and also for facilitating the delivery and removal of all heavy machinery and exhibits.

Near to the boiler-house was placed the dynamo-house containing the various engines and dynamos for the supply of motive power and current for the electric-lighting of the entire buildings and grounds.

At one or two convenient places throughout the Machinery Hall lavatory accommodation for the public was provided, but, in addition to this, it is essential to provide a sufficient number of staff lavatories for the use of workmen. In the Machinery Hall several hundreds of workmen were daily employed during the run of the Exhibition, and in the majority of cases their work was of such a nature that the frequent use of the wash-hand basin is necessary in order that the workmen might present a tidy and smart appearance; and if the lavatories are provided at places easily accessible to the workmen, it will tend to induce the men to make use of them more frequently than if they were placed in out-of-the-way and inconvenient positions.

In connexion with the Machinery Hall there should be provided an engineer's office, including private room, drawing office, and room for clerks or public office, with private lavatory accommodation.

Grand Avenue.

The Grand Avenue connected the Industrial Hall with the Machinery Hall, and also was connected with the Art Galleries by a short cross corridor, so that the whole of the main buildings might be termed as being under one roof. The Grand Avenue was 1,000 ft. long and 75 ft. broad, and had a centre span of 55 ft. broad by 30 ft. high, with an additional 10 ft. projecting from each side for placing exhibits. The roof was of wood, and formed of laminated arch principals placed 14 ft. 6 in. apart, connected by 8 in. by 2 in. purlins, the arch consisting of three thicknesses of 7 in. by 1 in. pieces, with 6 in. by 1 in. wood spears or radiating lattice work, connecting arch to rafters, which were formed of two 7 in. by 1½ in. with 1 in. space between. The upright sides of principals were made of two 7 in. by 2 in. battens, with a 3 in. space to allow the arch to run down between and be bolted to sides of same. At the centre was a large louvred ventilator, running the whole length of the building. The lighting was principally from the roof, and the covering was corrugated iron and glass. The laminated arched roof is one that is particularly useful for exhibition purposes, because of the effect gained at little cost. This form of principal requires to be very carefully constructed. The material used is so light in scantling that the downward thrust of the weight on the roof must be kept rigidly in a vertical plane, for if the arch buckles, which it has a tendency to do if not carefully made and put in position, it becomes an extremely weak truss, and will gradually go from bad to worse.

The principals should be constructed on perfectly level ground, or preferably on a platform; the joints of the laminations should be cut true and joined tightly. Special care should be taken when erecting to keep the trusses flat by poles bound from side to side. The extreme west end of the Grand Avenue connected with the bridge which spanned Dumbarton-road, and the levels, were so arranged that the west end of the avenue and the gallery round Machinery Hall were practically on the same level, and by giving a slight camber to the bridge connecting the two, sufficient headroom was got for the roadway below the bridge. By this arrangement all steps were avoided, and visitors could pass along the Industrial Hall through the Grand Avenue, over the bridge, and round the gallery of Machinery Hall without requiring to make use of a single step.

The Grand Avenue had one entrance from, and an exit to, Dumbarton-road near its centre, in addition to large exits at either end leading into the park.

Concert Hall.

The chief building in the grounds, apart from the main buildings, was the Grand Concert Hall, attached to which was one of the principal restaurants. The Concert Hall was a circular building, this form being adopted chiefly on account of the accommodation required, and the shape of the site available. The building was 140 ft. in diameter, exclusive of the outside surrounding corridor, with a gallery all round except at the portion occupied by the chorus, orchestra, and organ. In the original design for this building an organ recess was formed behind the chorus, and four additional rows of seats were provided in the gallery, with two additional staircases, giving seating accommodation for about 5,000 persons. The plan, however, was curtailed and modified, the organ recess being dispensed with and the width of gallery reduced, so that the building, as executed, could seat about 4,000 persons. Surrounding the building ran a corridor 10 ft. wide, formed as a lean-to against the main building, the various doors opening into the corridor, allowing ample provision for exit. The structural work of the Concert-Hall was of steel. The steel principals were placed at 18 ft. 6 in. centres, at the outer circumference of the circle, and were supported on two circular rows of steel columns, the inner and outer rows being 12 ft. 6 in. apart. These columns rested on concrete foundations to which they were bolted, and were connected at the top and also at the gallery floor level with braced girders. They were also braced at these levels longitudinally, this bracing extending round the entire building binding it together.

The roof was saucer-shaped, and rose to the height of 62 ft. above the floor level at the centre. A cupola surrounded the crown, which served as a ventilator. Wood battens were bolted to the steel work of walls, roof, and ceiling, and to these the fibre plaster was nailed. The hall was lighted from the centre of the roof, and also by side windows. The latter were provided with opaque blinds which were drawn over the windows when biograph or

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such like entertainments were being given. The roof externally was covered with McIlwraith's canvas decking, a material having a smooth surface somewhat like linoleum, forming a very suitable surface for paint, and keeping longer clean in a smoke-laden atmosphere than canvases or felts of a rougher texture, which have a tendency to gather dirt more quickly than the smoother material. The jointing of the canvas on a round roof must, of course, be vertical, tapering towards the apex. The cover should be ample, not less than 3 in., and well bedded with red lead in the laps. It should be nailed with copper tacks placed about 1½ in. apart; ordinary tacks, even for a temporary purpose, should be avoided, as, after an exposure to the weather for a month or two, they begin to rust and break away, causing leaks and discolouring the roof.

In laying the canvas, care should be taken that the joints of the various strips are properly radiated from the centre to the circumference, otherwise a twisted effect will be given to the roof, and when a cheap material like this is being used, the workmen are apt to overlook this, their main object being simply to get the roof covered. When properly laid, these lines assist the perspective, by accentuating the curved form of the roof.

The Concert Hall was the only building in which a system of heating was introduced. This, however, was found an advantage, making the hall more comfortable in the cold weather in the beginning of May and in the latter end of October and November. As in most round buildings, there was a tendency to echo in the Concert Hall when the building was poorly filled. A system of festooning hung from the ceiling was adopted, which, to a great extent obviated the defect. For an orchestra or organ recital with a full house, however, its acoustical properties left nothing to be desired. I might mention that the interval of the echo increased as the centre of the building was approached by the speaker, the longest interval being when the speaker was immediately under the apex of the roof—a position, of course, which was never occupied in practice.

The restaurant adjoining the Concert Hall was chiefly constructed of wood, with fibre plaster as a covering on the outside walls. There is nothing in particular to describe about its construction or design. The chief point in restaurants of this kind is to see that ample accommodation is provided as regards the kitchen, its offices, and stores. Large staffs are employed in order to cope with the inrush of visitors on particular days, and unless the accommodation is sufficient, the staff as a consequence are much handicapped and visitors disappointed. Although these buildings are temporary, the business which is done in them is very erratic, doing practically nothing at times, while on other occasions they are taxed to their utmost capacity, and the kitchen accommodation provided should be equal to the greatest demand. The kitchen and service-rooms should be situated as centrally as possible. The former should have a concrete floor, and walls of brick, carried up, say, about 3 ft. above the roof, as a protection against fire. In addition to the usual kitchen offices and stores, large beer and wine cellars were provided in the basement, and a separate goods entrance should be provided in some position not too prominent, with direct access to the stores and cellars. In addition to the large dining-room and buffets, it is desirable to provide two or three smaller rooms for the use of private or small dinner parties. Ladies' and gentlemen's lavatories should be provided in all these restaurants, with separate male and female lavatory accommodation for the kitchen staff.

The other buildings throughout the grounds have nothing in particular requiring description, the construction being carried out in a similar manner to those already described.

Artificial Lighting.

I shall now say a word or two on the artific al lighting of the various buildings and the grounds.

Electricity is the only illuminant which should be used for the inside lighting of exhibition buildings. This may be done either with arc lamps or incandescent lights. As to the decorative superiority of incandescent lighting over the arc lamp, there can be no question. The architectural features, such as the curved principals of the roofs, the lines of piers and cornices, can be picked out, thereby assisting the architectural effect of the interior and giving a warmth of colour to the whole. All these advantages are wanting in the cold and uninteresting effect produced by the arc lamp. Of course, to produce the same illuminating power the incandescent requires much more current than the arc lamp, and is consequently more costly; but in most of the large exhibitions a considerable amount of the lighting plant is supplied gratis by exhibiting firms. In the case of the Glasgow Exhibition the steam boilers, engines, and dynamos were supplied practically free of cost to the executive, and had this power been sufficiently augmented by the Exhibition authorities, the whole of the interior of the Industrial Hall, at least, might have been transformed from the cold and unsympathetic effect which it presented with the arc lamp system to the brilliant jewelled effect which was so much admired when the exterior of the buildings was illuminated.

The electric lighting of the buildings was divided into three distinct sections, namely—Industrial Hall, Grand-avenue, and Machinery Hall, and each section was still further divided into several circuits, so that as little inconvenience as possible might be caused in the event of a breakdown.

The Industrial Hall was lighted by means of 345 10-ampere arc lamps suspended from the roofs. The Machinery Hall had 250 10-ampere arc lamps, and the Grand-avenue had 105 10-ampere arc lamps. It is necessary to distribute a few incandescent lamps over the buildings to act as pilot lights when the arc lamps are turned off at night.

The Concert Hall was lighted by 330 16 c.p. and sixty 32 c.p. incandescent lamps; for this building, however, this was not enough. Even although the ceiling was pure white, and acted as a strong reflector, an extra 100 16 c.p. lamps would have given a more satisfactory result.

When large buildings are lighted by the arc lamps, these, as a rule, are placed too low, and have a blinding effect and obscure the view; when kept well up, they give a better and more diffused light without dazzling the eyes, while at the same time they give an apparent increase to the height of the interior. Wherever it is possible, it is desirable to have duplicate systems of electric lighting, and if a supply of current can be obtained from a corporation or some other independent installation, it should be connected to the exhibition system, to be used as a stand-by in the event of any breakdown taking place with the exhibition plant.

Throughout the grounds several systems of lighting were adopted, chiefly electricity, compressed gas, and compressed oil. Very satisfactory results were obtained from the compressed incandescent gas both as regards cost and illuminating power. The gas used was the ordinary corporation gas, which has an ordinary pressure of 1½ in. water gauge and was compressed by two large automatic gas compressors (worked by the city water service) to about 8 in. water gauge. In brilliancy it rivals the electric arc lamp, and I believe the comparative costs are about three to one in favour of the incandescent gas; compared with the ordinary gas system, light for light, the cost of the compressed incandescent system is about one-fourth of the former. The amount of the illuminating power used in the grounds of this system alone was about 240,000 candle power. It is a form of lighting admirably adapted not only for exhibition grounds, but for street lighting in towns, railway stations, and wherever large areas are wanted to be lighted. It was first used on a large scale, I believe, in the grounds of the Paris Exhibition of 1900.

Throughout the grounds eight conveniences, containing lavatories and water-closet accommodation for ladies and gentlemen, were provided at convenient distances. These should not be too prominently situated, but the notice-boards directing to them should be placed in positions where they can be readily seen by the public.

Cost, &c.

I will now deal for a moment with the cost of the buildings. While it is an easy matter for an architect to arrive at the approximate cost of a permanent structure built with the usual building materials, it is a more difficult matter when dealing with temporary buildings on a large scale with light scantlings, and where the cheapest materials and workmanship are used. The following figures therefore may be of some value. The cost of the Industrial Hall was about 60,000*l.*, or at the rate of 1½*d.* per cubic foot of contents (cubing the building from the ground line to half way up the roofs), or equal to 2*l.* 8s. per square yard of covered area. The Machinery Hall cost about 22,000*l.*, equal to ¾*d.* per cubic foot of contents, or about 16s. per square yard of covered area. The Grand Avenue, where no steel was used in the construction, cost 9,300*l.*, equal to ½*d.* per cubic foot of contents, or 1*l.* 2s. per square yard of covered area. This building, however, was long and narrow, and all its walls were more expensively finished than those of the Machinery Hall. The Concert Hall, where the framework was entirely of steel, cost 12,600*l.*, equal to 2½*d.* per cubic foot. The various restaurants and kiosks throughout the grounds, which were built entirely of wood and plaster, ranged in price from 400*l.* to 5,000*l.*, the price per cubic foot of the more ornate being 2*d.*, and of the plainer types 1½*d.*, per cubic foot.

In conclusion, I may say that I have treated this subject merely from its utilitarian and technical side, and in doing so I have endeavoured to bring before you such details and particulars as are peculiarly adapted to the class of buildings under description. While the materials and workmanship of a temporary building are necessarily of a cheaper and rougher description than those used in permanent structures, the mere fact that this is so greatly increases the responsibility of the architect. In the first place, with the permanent structure he is more familiar with the usual methods of construction, and where such buildings are large and important, as a rule he has ample money at his command, and the margin of safety is generally far beyond any strain which is ever likely to come on them. With temporary structures, however, and particularly with exhibition buildings, matters are somewhat different; for while the architect is required to produce buildings of large floor areas with attractive elevations, the money placed at his disposal is, as a rule, none too plentiful for the requirements.

In order to produce the best result he is compelled to reduce the margin of safety of the structure to its lowest limit. The buildings must be stable enough to resist the heaviest gales—its floor and galleries sufficient to withstand the surging and swaying of immense crowds; and it is here the architect is confronted with his chief difficulty, namely, how to arrive at a happy medium as regards his construction, so that he may not spend unnecessarily on materials and superfluous strength, thereby proportionately curtailing the amount of money available for the decorative part of the scheme. If, therefore, the matter I have placed before you this evening, however inadequately it may have been dealt with, should be of value or assistance to any of you who may be entrusted with similar work as that which I have endeavoured to describe, I shall feel satisfied with the effort I have made.

Some interesting lantern views were then shown of the various buildings of the Exhibition.

Mr. H. D. Searles-Wood, in proposing a vote of thanks to Mr. Miller for his interesting paper, said the paper was particularly valuable because of the way in which Mr. Miller had dealt with the details of construction. The subject was one that students might devote attention to with advantage, for if a student could get confidence in covering large areas with few supports, it would be an advantage to him in dealing with permanent buildings. Another matter which was specially interesting from the student's point of view was that exhibition buildings had to be designed so as to produce their effect at once. The designer could not depend on the embroidery of time to hide or touch up any deficiencies in design. It would be interesting to know what the weight of the dome was on the supports; and could Mr. Miller give them any idea of the breaking-up value of the buildings? The buildings containing the steel construction were much more expensive than the others, but was the break-up value of them greater, too, or was there a difficulty in disposing of the steel—a greater difficulty than in the case of the timber? As to the buildings of the Exhibition, they all knew what a charming effect they produced. In his opinion the effect in some respects was more interesting than in the case of the buildings of the French Exhibition, partly on account of

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the restraint exercised and of the colour. The general tone of white was more interesting than the more gaudily coloured French Exhibition buildings.

Mr. W. J. H. Leverton formally seconded the vote of thanks.

Mr. G. Scamell, in supporting the vote of thanks, said that reference had been made in the paper as to galvanising strengthening iron. He would like to know the authority for that, for his experience had been quite the opposite. He had occasion some years ago to use a lot of iron hooping, and in talking the matter over with one of our large galvanisers he was told that if he used the very best iron hooping and galvanised it, it would bring it down to common hooping. They experimented, and after working the iron they managed to break it, and found it broke with a large fibrous break. Some of the same iron was then galvanised, and when it was broken it broke with a short fracture: the galvanising had taken the life out of the iron, and had considerably weakened it.

Mr. H. P. G. Maule, in supporting the vote of thanks, said he had not seen the buildings, and he now regretted it very much. Mr. Miller, in his opinion, had given to this country—or perhaps to Scotland, he should say—the most comprehensive exhibition scheme that had ever been carried out in the British Isles, and probably the best. The London exhibitions were lamentably deficient architecturally. One saw in the Glasgow buildings the great advantage of the general scheme and design of all the buildings being in one hand and under one person's design. The paper was full of interest, and there were many practical points relating to the success of an exhibition—points that would not occur to any one in the ordinary way.

The Chairman, in putting the vote of thanks to the meeting, said he desired to express his personal thanks to Mr. Miller for his paper, and to express his sense of the value of the address to members of the Association. He felt sure the students would consider the paper a very valuable one. As had already been said, the ability to deal with these temporary buildings effectively and a knowledge of the principles on which they were designed, and of the many details connected with their erection, must be of very great service to young architects. They must all congratulate Mr. Miller upon the art feeling he had displayed in his designs for the buildings. The work was won in competition, and in the buildings there was that delicacy and art refinement which the French displayed in their work, but sobered by that English—or Scotch, or Anglo-Saxon—reserve which was essential in the production of really satisfactory work. He had felt all along that the fault of the Paris Exhibition was that the buildings were overloaded with all kinds of ornament which was irrelevant to their construction, but in the Glasgow Exhibition buildings a reserve had been shown which, in his opinion, had resulted in the production of the most beautiful exhibition buildings so far erected. The success of the exhibition was only another illustration of what could be done when a sufficient number of people were interested in doing a thing well. The ½-in. scale details shown by the lecturer should be looked at carefully, for it would be useful to understand the construction and the light iron and wood principals. He would like to ask Mr. Miller if acetylene gas was tried in the illumination of any of the buildings. Acetylene gas had come to the front as an illuminant, and, so far as he had had experience of it, it was very successful.

The vote of thanks having been put to the meeting and heartily agreed to,

Mr. Miller, in reply, said he was not able to state the weight of the material of the dome, but the weight of the steel of the main avenue of the Industrial Hall was 1,400 tons; altogether there were 2,600 tons used in both the Industrial Hall and the Machinery Hall. The first estimates they got for the steel was from 12*l.* to 14*l.* per ton, while the last estimates were from 19*l.* to 20*l.*, owing to the rise in the price of materials. As to the breaking-up value of such buildings, a good deal always depended on whether people wanted the material at the time the buildings were broken up. If any one wanted to build a railway-shed or workshop at the time, a good price could be obtained for the material—perhaps from 4*l.* to 5*l.* per ton for the steel work, or even 6*l.* per ton; though in the case of scrap, not more than 2*l.* per ton could be realised, and in that case the wood would be of more value. The breaking-up value of some of the woodwork at the Glasgow Exhibition had actually as much as the original schedule price for material and workmanship, the explanation of that being that where large quantities were quoted for, the prices were cut very low; and when the buildings were taken down and the material was put into lots, builders came and bought small quantities, and higher prices were in that way realised than would be the case if the material was sold in large quantities. As to galvanising iron, it was quite true that galvanising made iron more brittle, and if a hoop were galvanised and bent backwards and forwards it would break more quickly than if not galvanised; but for a roof, a galvanised corrugated sheet of the weight he had mentioned—not much thicker than brown paper—was stiffer than an ungalvanised sheet of the same thickness, and so not liable to give way at the fixings. An ordinary T bar, galvanised, was weaker than when not galvanised, but in the case of corrugated sheeting, the stiffening of it increased the strength as a covering material. As to acetylene gas, it was not used at the Exhibition, although some of the exhibitors had it; he had a very high opinion of it, and it gave a very good light, though not so good as the high-pressure gas with incandescent mantles, and he thought it was a little more expensive. The expense of acetylene gas had come down very much in recent years. As to exhibition buildings, the date was the first thing fixed, whereas with most other buildings the date of the completion of them was left until the building was well advanced. In the case of exhibitions the fixing of the year settled the date within a few days, and the building had to be finished to time. Another point he would like to mention was as to the placing of exhibits in an avenue or corridor. He felt the architect should be consulted as to these matters, though unfortunately this was not always done. In the case of the Grand Avenue at Glasgow Exhibition, which was 1,000 ft. long, exhibits were placed in the centre and along the sides, and the architectural effect was completely ruined. In all long avenues like the one referred to a better effect was obtained when the corridor or walking space was arranged in the centre.

Photographic Records.

The Chairman said that Mr. G. Scamell, the hon. secretary of the Photographic Record Association, was present, and he would ask that gentleman to say a few words as to the objects and work of that Society.

Mr. Scamell said the object of the Photographic Record Association was to collect photographs of any object of interest that might be of use to the architect or the archæologist, or the literary or scientific man, of some future time. The Association had a fairly strong Council, and photographs were collected from any one who would be good enough to part with them. They preferred the whole-plate size, but they did not refuse to accept half-plate or even quarter. The only condition they made was that the photographs should be by some permanent process, either the platinum, carbon, or photo-etching—bromides they did not care about, for they could not be depended upon. The photographs were mounted by the Association—they had chosen a cut-out mount so that the photographs should not be rubbed—and when mounted they were sent to the British Museum, where they were kept in the Print Room. So far, 2,500 photographs had been sent in, and they were available for public reference. It was hoped that the Museum authorities would give them, in time, a good index, for at present the index which was being prepared was rather defective; it was being arranged in counties in order to see how the collection would shape. As to the subjects, the Association accepted anything which was in the transition stage, such as old customs going out; and he appealed to all architect-photographers to let them have suitable photographs for the collection.

The Chairman announced that the next meeting would be held on the 21st inst., when Mr. W. H. Lever would read a paper on "Dwellings Erected at Port Sunlight and Thornton Hough." The paper had been prepared in book form, illustrated, and every member present on the occasion would receive a copy of the paper.

The meeting then terminated.

MAGAZINES AND REVIEWS.

THE *Art Journal* devotes an article to what must be a very interesting collection of pictures by eighteenth-century French painters, which has been lent by their owner, Mr. Reginald Vaile, to the Mappin Art Gallery at Sheffield. One cannot judge of colour from the engravings, but at any rate in point of composition and expression Nattier's group of the Countess of Newbourg and her daughter, which forms the frontispiece to the number, is a specimen of portraiture of quite unusual charm. Among the other illustrations, it does not seem to be noticed that Trinquesse's "Serment d'Amour" is, in point of the action of the figures and the whole *motif* of the composition, an imitation of Fragonard. The illustrated article on "Rothiemurchus" is continued, and a short article on "Artistic Jewellery" shows by some examples what good jewellery is to be had in this country now, if the public were only discerning enough to buy it; but we fear the prevalent taste is still for the ordinary trade jewellery. The writer of a short article on the late Mr. John Brett does not seem to be aware that the painter did not migrate direct from Harley-street to "Daisyfield," but that before that he had lived for some years in another house in Putney, also planned by himself; also a single-story house, with a top-lighted central drawing-room and the other rooms opening out of a corridor round it, and an asphalted flat roof, which was to be the playground for the children. "Daisyfield," on the borders of Wimbledon Common, was planned in a less abnormal but still very original manner, the central portion of the house being a kind of nave and transept, which was divided off into rooms at pleasure by heavy curtains. It seems to have been practically admitted that the top-lighted drawing-room was a mistake.

The *Magazine of Art* is mainly occupied with articles on various artists and their work; the most interesting article being that on Geoges Bertrand, by Prince Karageorgevitch. Bertrand's work, full of genius as it is, is not much known in England, and the article on it, with the illustrations, is worth attention. Other subjects are "Rowlandson" (continued from last month)—the illustration of "Harmony" shows him at his best; Mr. W. B. Hole and his mural paintings at the National Portrait Gallery, Edinburgh, by Professor Baldwin Brown—a sympathetic tribute to the author of a remarkable effort in modern mural painting; Lord Ronald Gower, whose works in sculpture do not appear to us to be worth this special consecration; and Mr. John F. Bacon, a painter of real genius, who has however never quite satisfied the hopes of him which were raised by the two remarkable paintings "The Interval" and "The Announcement" (since called "The Young Widow") which first introduced visitors at the Royal Academy to a new genius in painting. "A Vanished Art" is the title of a short article on old Irish embroidered muslin, with some examples which are sufficient to make one regret that this national art is, as we are told, practically lost. It lost its market some time since through a concatenation of circumstances, and has never revived.

The *Artist* contains an article on, with a good many illustrations of, book-plates designed by Mr. Anning Bell, all of which are admirable as examples of what a book-plate ought to be. Mr. G. R. Dennis, the writer of the article, makes some forcible remarks, with which we entirely agree, on the artistic vulgarity of the realistic order of book-plate—the portrait of the owner sitting in his library, &c., &c. Book-plates, as he says, should be examples of imaginative and decorative design. "Art in the Postage Stamp," by Mr. F. L. Emanuel, draws attention to a subject that has been rather neglected, but we think the author is too hard on the new penny stamp, which, as we have already observed, is not a bad design in a simple and unpretending way, though the others are bad enough. An interesting page of examples of stamp designs is given.

The *Architektonische Rundschau* gives an illustration of a new bank in Stuttgard, by MM. Eisenlohr and Weigle, which exhibits some agreeable variations on Classic detail, and a horrible Kaufhaus building in Berlin designed with thin stone piers running the whole height of the building, with ogee arches at the top, and thin pilasters on their faces capped by naturalistic carved capitals looking like sponges, all the intervening spaces being filled with iron standards and glass; a building

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in worse taste, from the English point of view' it would be difficult to imagine. Professor Otto Rieth is the architect. The most satisfactory thing in the number is a small octagonal church with a cupola, for a rural district, designed by Herr Schwechten, of Berlin. From the illustration it appears to be rough-cast or cemented on the exterior; but it is a pleasing little building, which contrasts agreeably with some of the costly vagaries of modern German architecture.

In the *Berliner Architekturwelt* the Rathhaus for Charlottenburg — Messrs. Reinhault & Süssenguth, architects — looks a good deal like a factory or emporium, but includes a design for some very boldly treated iron gates in the principal entrance, which is worth attention. Among the other illustrations is that of a private residence in the Bendlerstrasse, by Messrs. Hart & Lesser, which shows a dignified street front and an original but soberly treated interior staircase. The designs for a Heldengrab, by Herr Schaudt, and a Stadt-thor ("town gate") for a seaport, by the same architect, are like bad dreams. In the latter the arrangement of openings or windows in the top of the front towers so as to give a grotesque suggestion of a human face, represents the lowest depth of bad and vulgar taste. It shows painfully what is the state of feeling about the art of architecture in Germany, that such a monstrosity can be accepted and illustrated in what professes to be a leading architectural periodical.

The *Edilizia Moderna* gives the plan and various illustrations of the new Exchange (*Borsa*) at Milan, a respectable Classic building with a rather fine interior *cortile* with an arcaded loggia round it. A good deal of care and ability has been bestowed on the sculptural and other decorations of the building.

The *Quarterly Bulletin* of the American Institute of Architects is practically a report of the thirty-fifth annual convention of the Institute, held at Buffalo in October of last year. It is largely occupied with papers on the Pan-American Exhibition, its design, arrangement, and decoration; papers which are intended to lay down principles generally applicable to the æsthetic treatment of such exhibitions. There are also two papers on the "Tarnsney Act" in connexion with building operations; the nature of which Act we do not know, but it appears to have occasioned a good deal of criticism from American architects. Some portion of the first paper, by Mr. W. A. Boring, is directed against the Government system of adopting the lowest tender from builders; the following remarks are worth quoting:—

"The architect prepares designs for a building, and in his imagination there exists a beautiful, well-finished structure. He writes the specification describing the construction, which to him represents perfection in solidity, form, texture, and finish, and describes in unmistakable terms his ideal. The builder who puts in the lowest bid reads the specification and checks it off line for line to discover how he can build to come just under the exact wording of the specification and yet omit the necessary expense incident to carrying it out in the spirit in which it was conceived, and submits a proposal accordingly.

The Government, in accordance with the law, which is really mandatory, lets to the lowest bidder, not to the best bidder. Bidders for Government work usually base their figures upon the execution of such work as will pass inspection and be accepted, and not upon the character of work which is ideal.

Perfect drawings, specifications, and documents cannot ensure a perfect building. An incompetent builder cannot, and a dishonest builder will not, do good work, even with excellent supervision and first-class documents. The chief difficulty in obtaining a good building is the system which accepts the lowest bid regardless of the contractor's training or ability or his reputation for doing good work, the only provision being that he must be able to give suitable security and show financial responsibility.

If we start with the proposition that the building is to be a first-class construction, only the highest type of contractors should be permitted to bid, It is well known that an incompetent builder or a dishonest builder will not produce, and cannot by any means produce, a proper building, and it is also well known that all drawings and specifications of good architects call for good construction, so that the real responsibility for bad construction lies with the builder. The trouble is not with the documents, it is not with the superintendent, it is with the builder.

I think I can safely say that there is no architect who would be awarded the commission of a public building who would not be willing to change and perfect his plans to almost any extent were criticism made on them by the secretary of the treasury or the supervising architect. He would endeavour by all means to please and to produce the very best that was in his power. The builder, however, does not assume this attitude. The faults in plans and specifications that are found in a building are very rare.

The question is *where is the system weak touching this view of the case, and how can it be strengthened?* The real difficulties in the construction of the building are: 1. The incompetency of the builder and his organisation. 2. The attempts by the builder to vary from the specifications by supplying work or materials which are less expensive and give greater profit to him.

If it were a fact that the plans and specifications were really to be followed out to the letter, first-class builders could do the work cheaper than the men who bid below them, and the incompetent and dishonest men would soon be driven to the wall.

Under the system of the lowest bidder, when work is improperly done, the proper procedure is to take the work away from the unreliable builder and award it to a better one at a higher price, taking the difference in price from the bondsmen of the first builder, and nothing short of this will cure the evil, but the Government is loath to do this."

Feilden's Magazine contains an interesting article on "Recent Aeronautic Experiments," with illustrations of various types of aerial machines. A leading article under the title "The Industrial Peace," is concerned with endeavours that are being made in New York to devise means to prevent the recurrence of strikes. The following passage is quoted from an American paper:—

"So long as the unions keep fetters on the intelligence, enterprise, and thrift of the individual they are at war with the laws which are at the root of human progress, and so long they are a threat to society. It would be a pretty *good plan to send a few deputations of working men to England, and to give them a chance to see with their own eyes the logical working out of the restrictive idea of the Trade Unionism.* Perhaps Mr. Schwab and Mr. Hanna, and a few other very rich men, may think it worth their while to raise a little fund to carry out this little scheme." "The italics [says the author of the article in *Feilden*] are ours, and we commend the idea to the careful attention of all those who are still inclined to sympathise with the Trades Unions, for it is so very suggestive. Whilst we are busy sending deputations across the Atlantic to see how things ought to be done, they are contemplating the necessity of sending deputations to this country in order to convince their working men of the individual and national dangers that the idiotic policy of the present-day Trades Unionism will, if persisted in, inevitably lead them into."

The *Antiquary* contains a paper by Mr. Thomas Sheppard on "The Antiquities of Brough, East Yorkshire," which gives some interesting information on British remains of different kinds, and is to be continued in a future number. "Thatched Churches" is the subject of a communication by the Rev. G. H. Evelyn White. The writer is not, we are glad to find, a fanatic in favour of thatched roofs (which some persons wish to see revived), but is treating the subject historically. He is quite aware of the practical disadvantages of this undoubtedly picturesque form of roof, and quotes a significant order of the local anthority of Ipswich, under date April 22, 1608, to the effect that "all houses and buildings that are now thatched shall have the thatche thereof taken downe, and the same houses, &c., shall be tiled . . . before James' day next." Among the "Notes of the Month" is an illustration and description of an old rush-light lamp which is among the curiosities of the Hull Municipal Museum.

Mr. Claude Phillips contributes to the *Nineteenth Century* an eloquent article on "The Increasing Export of England's Art-Treasures." The article constitutes a very complete summary of the principal sales of remarkable pictures out of this country of late years, the principal danger coming now from America, and from the immense and tempting sums which American millionaires are willing to offer for the acquisition of great paintings out of English private collections; not always in a purely selfish spirit, for some of the American purchasers have presented their acquired treasures to public galleries in their own country. Mr. Phillips concludes with an appeal to the patriotic spirit of English owners—the only form of appeal which can well be made, for it is hardly to be thought of that our Government can interfere to prevent private owners from selling their own property. But Mr. Phillips proposes that at all events an English owner of an important work of art, who needs money, and is tempted by a large offer, should in the first instance give the refusal of it to the Government for a national museum, and that the Government should recognise the necessity, for the honour of the country, of spending money liberally for the purpose of keeping our art treasures with us. These works, as Mr. Phillips says, "are the very heart and soul of the nation, as of the individual; without which there must be spiritual death, for the one as for the other." In referring to the case of the Elgin marbles, as an example of our own past misdeeds in taking native works of art out of another country, Mr. Phillips hardly puts the case for the defence strongly enough. He recognises the fact that in the British Museum the Parthenon marbles have been an artistic influence such as they could not have been if left on the ruined building; but the case is stronger than that: if they had been left where they were at the time Lord Elgin took them, they would have been destroyed altogether, and have been lost to the world, before the recent period when modern Greece awoke to the value of the remains of her ancient art.

In the *National Review* the Hon. Claude Hay writes a very earnest and thoughtful article under the title "Home-truths about Housing." To a great extent Mr. Claude Hay relies upon houses out of London and increased facilities of cheap transit. But he accuses the Local Government Board of being very slack in the administration of the Housing Acts; and he also has some very strong remarks as to the manner in which railway companies, as he asserts, "by private arrangements with owners of property, get the sites they intend to acquire handed over to them clear of the houses, so that they may not be bound by the rehousing clauses that would be introduced into their bills. The purchase of model dwellings adjoining Broad-street Station enabled the London and North-Western Railway to undertake the dispersion of nearly 600 people who could be driven away without any provision being made for them." The author recommends the appointment of a separate commission, such as the Charity Commission or the Railway Commission, whose sole duty should be to direct and control the administration of the Housing Acts—"to supply information to Local Authorities, to stimulate the energies of those that neglect their duties, and to encourage those that are alive to their responsibilities but have to contend with difficulties they cannot surmount without the help from a central well-organised body which is not now forthcoming."

In the *Monthly Review* Mr. Havelock Ellis, in an article on "The Evolution of English Painting," analyses the influences under which the art of painting was developed in England. He considers that Vandyke offered the English public just the kind of painting which it could at that time understand and appreciate. But to say that Vandyke fixed the English taste, or that Reynolds was a kind of English Vandyke, seems to us to be overstating the case. We are inclined to think that Reynolds would have been Reynolds, had not Vandyke preceded him. It is true however that Gainsborough was "much more English than Reynolds," and his method of painting Mrs. Siddons, simply in her natural look and attitude, is significantly contrasted with Reynolds's rather theatrical depiction of her as "The Tragic Muse." In colour Gainsborough certainly has the advantage; but is not Reynolds's a greater conception? Greater, too, exactly in the proportion that it is less insular in taste and feeling.

The *Pall Mall Magazine* includes an article by Mr. E. Walter Maunder on "Changes in the Moon—Real and Apparent." He touches upon an idea which has recently been suggested in some quarters, that the moon is not really so "dead" as we have been accustomed to think, but argues that some apparent changes in the appearance of some of her mountains and craters are rather due to the effects of light and shadow than to any substantial alteration. The article contains some instructive analysis of the relation of the moon's former atmosphere to conditions of gravitation, and reasons why it could not be expected to remain long in connexion with the planet. There is also an article by "An American Correspondent" on "The History of the Canal Treaty"; an article dealing with the political rather than the engineering side of the question. It is accompanied by a map showing the various routes that have been proposed—as many as six: the Nicaragua route, the Chiriqui route, the Panama route, the San Blas route, the Caledonia route, and the Arato route; besides the ship

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railway overland route which at one time had its supporters.

Scribner contains an article on "The Heart of England," viz., the business quarter of the Thames and the docks, by Mr. John Corbin, with illustrations by Mr. André Castaigne. The article is pervaded by much appreciation of England and London, in spite of the criticisms, natural from an American, in regard to our slow and old-fashioned way of handling merchandise. "In London to-day the commerce still drifts and is steered. None of the great ports of the world has had a longer or more varied history; it is the heart of the greatest of commercial nations, and the cradle of the mistress of the seas; but it is still regulated by the tide. It is at last well proved, this philosophy of drifting and steering. Who can say that it will not continue to rule the world for another 2,000 years? Its methods are not brilliant, but they are sure."

In the *Century* the article on "The Improvement of Washington City," by Mr. Charles Moore, is continued. The view of the monument and terrace as seen from the White House certainly serves to emphasise the out-of-axis position of the monument, to which reference has before been made, and which it is proposed to remedy by manipulating the lines of "The Mall." There is evidently space enough for great effects, at all events. "A Bavarian Bric-à-brac Hunt," by Mr. P. G. Hubert, may interest those who want a new ground for this particular kind of hunt. There is also "An Authoritative Account of Marconi's Work," by Mr. P. T. McGrath, and "Four Drawings of Animals" almost *en silhouette*, by Mr. C. Livingston Bull, which show a great deal of power.

The *Gentleman's Magazine* contains an interesting article by the Rev. J. W. Cotton on "The Latest Astronomical Heresy," a review of the theory of the stellar universe embodied in a book entitled "The Romance of the Heavens," by Professor Bickerton, of New Zealand University. We have not space to state the theory and the opinions of the author of the article; it is a somewhat complicated matter; but the article will be of interest to students of astronomical theories.

In *Knowledge* Mr. Maunder continues his series of articles on "Astronomy Without a Telescope" and Mr. Cecil Jackson contributes an article on "The Use of Hand Telescopes in Astronomy," in this case with special reference to the observation of the sun.

COMPETITIONS.

BAPTIST CHURCH, ILKLEY.—In the competition for Baptist church and schools, Ilkley, the first premiated design was that sent in by Messrs. Garside & Pennington, Ropergate-chambers, Pontefract; the second premiated design was by Messrs. G. F. Danby and E. M. Simpson, Park-row, Leeds.

QUEEN VICTORIA MEMORIAL, LIVERPOOL.—The first premiated design in the competition for the Queen Victoria memorial, Liverpool, was that sent in by Mr. R. Lindsay Clarke, Christ Church House, Malvern-road, Cheltenham; the second was by Messrs. C. J. Allen, Fredk. M. Simpson, W. E. Willink, and P. C. Thicknesse, Castle-street, Liverpool; and the third by Mr. Henry C. Fehr, The Avenue Studios, Fulham-road, London. The design selected by the committee is the one submitted by Messrs. C. J. Allen, F. M. Simpson, W. E. Willink, and P. C. Thicknesse. The statue, which is 14 ft. high, and of bronze, will be placed on a pedestal 6 ft. high, under a stone-work canopy, designed in the Ionic order. It shows the late Queen in her robes of State, with crown, sceptre, and orb. The dome over the statue is supported by sixteen pillars, arranged in four groups. The ceiling of the dome will be of gold mosaic, lighted after nightfall by electricity, the light being reflected from the roof on to the statue. In front of each group of pillars is an advanced pedestal, and on these pedestals will be placed bronze groups representing Justice, Charity, Knowledge, and Peace. Over the dome, surmounting a gilt globe, will be a winged figure of Victory. Between the advanced pedestals are flights of steps leading to the interior of the canopy. The total height is 56 ft. 3 in.

BAPTIST CHURCH AND SCHOOLS, WELLINGBOROUGH.—The designs submitted by Messrs. George Baines and R. Palmer Baines, Clement's Inn, Strand, W.C., have been accepted for these buildings. The accommodation in the church will be for 601 adults. The estimated cost of the complete scheme, including a tower, is 4,923*l*.

MOUNTAIN ASH MUNICIPAL BUILDINGS.—In this recent competition, the design submitted by Mr. J. H. Phillips, of Cardiff, was placed first by the assessor, Mr. G. Halliday, F.R.I.B.A. Mr. Phillips has received instructions to proceed with the work.

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—At the general meeting of this Institute on the 5th inst., Sir Henry H. Howorth, President, in the chair, Professor T. McKenny Hughes gave a short sketch of the history of the early potters art in Britain. He first explained the names which he applied to the various divisions to which he referred the successive types: British, Roman, Romano-British, Romano-English, Mediæval; premising that these were quite arbitrary terms which did not coincide exactly with either divisions of time or distinctions of race, but which, though they might overlap here and there in a greater or less degree, still possessed distinctive characters by which they could be recognised even when thrown together by the survival of the older after the introduction of the newer, or the accidental commingling of remains of different ages. The pre-Roman or British ware, as it was commonly called, was of various type, as might be expected from the existence of so many different tribes in different parts of the country. He drew attention to the scarcity of British ware as compared with that of Roman date, and to the rare occurrence of any except with interments, and suggested that possibly this was more apparent than real, being partly due to the difficulty of determining the age of the plainer vessels used for domestic purposes, and the consequent reference of only the ornamental vessels to the pre-Roman age. The Roman ware was so much better and stronger that it was in time accepted almost everywhere, and the rude and perishable native pottery ceased to be made. In dating finds of pottery, the presence or absence of Samian ware was of great importance, regard being had to topographical conditions. The various Scandinavian and German tribes pouring into the British Isles did not seem to have brought with them much pottery. For the burial of the dead they long continued to import and make their traditional cinerary urn, but for general purposes they adopted and carried on the manufacture of Roman ware. He quoted a passage from the Pontificale of Egbert, the first Archbishop of York in the eighth century, to show that when those Early English came under ecclesiastical discipline there was a regular form which was used to purify vessels which had belonged to their Pagan predecessors; which proved that the better class of vessels which had belonged to the Romanised Britons was still in use among them. —Mr. F. G. Hilton Price, Dir. S.A., read a paper on "Pawnbrokers' Signs in London in the Seventeenth and Eighteenth Centuries." Money lenders and borrowers of money have existed in all countries from the very earliest times, and instances were quoted from Ancient Egypt and Pompeii, and also several examples were given of Jews and other usurers in England who at a very early period were severely persecuted and punished for their evil practices. After the expulsion of the Jews from England in the reign of Edward I. no trace of them could be found until after the Reformation; but during this period the family of Corsini were settled as bankers in the principal cities of Italy, and they were invited over to England and soon began to practice usury to even a greater extent than the Jews had done. In about the fourteenth century they were succeeded by the Lombards, who were merchants and bankers from the four Republics of Genoa, Lucca, Florence, and Venice, and founded their branches in Lombard-street. From these cunning and industrious people the business of the goldsmith, the pawnbroker, and the banker had descended through many generations to the present time. Pawnbrokers were established as a separate trade about the end of the seventeenth century, and only at the commencement of the eighteenth century did they begin to advertise their trade in the newspapers. The origin of the sign of the Three Golden Balls was attributed to the lower part of the coat of arms of the Dukes of Medici, from whose States and from Lombardy the old goldsmiths came. The most favourite signs adopted by the old pawnbrokers in London towards the end of the seventeenth century were the *Bell*, Blue Ball, Crown, Golden *Ball*, Seven Stars, Sun, Three Bowls, Three Blue Bowls, Three Cocks, &c. It was a remarkable circumstance that out of the hundreds of signs of the houses of pawnbrokers from 1666 to 1731 only one occurrence of the Three Golden Balls used by a pawnbroker should be met with, and only one of the Three Balls; but of the sign of the Three Bowls there were a great number. But it appeared that from 1754 to 1765 there was a marked tendency to the adoption of either the sign of the Three Golden Balls or Bowls, or Three Blue Bowls, to the gradual extinction of other signs. After 1765 pawnbrokers appear to have adopted generally the sign of the Three Balls, golden or blue, as the sign of their trade, not as a sign of their houses, as these latter became known by a number. In the discussion that followed Mr. Greg, Mr. Mill Stephenson, Mr. R. G. Rice, Mr. Emanuel Green, and Mr. Henry Wilson took part.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the evening meeting on March 5, Dr. W. de Gray Birch in the chair, Mrs. Collier brought for exhibition a beautifully made Chinese "praying machine" of ivory and silk, also a mother-o'-pearl cross and an ivory carving, both about 150 years old. Mr. Oliver exhibited an old map of London dated 1723, and a finely carved ivory triptich, circa 1650, the centre panel representing the "Descent from the Cross," after the celebrated painting by Rubens at Antwerp. Rev. H. J. Dukinfield Astley exhibited a bronze or copper seal of the early fourteenth century found recently in a field close to the church of Tatterford, near Fakenham, Norfolk. It is of vesica shape, bearing the motto, "Mors Pelicani passio cristi." Mr. Cecil Davis exhibited a portion of a monumental brass, probably of the fourteenth century and of Flemish origin. It presents the peculiarity of representing a group of children with eight faces shown, but only six pairs of legs. The paper of the evening was by Mr. Cecil Davis the librarian of the public library of Wandsworth, and was headed "A Chapter in Local History, Wandsworth, 1545-1558." The parish of Wandsworth is very fortunate in possessing a set of records which are nearly complete from the year 1545, and they present a mass of most interesting and valuable information as to the habits and customs of the people of the sixteenth and following centuries. The church of those days stood upon the site of the present one, the mediæval tower still existing, but outwardly cased in modern brickwork. From the records we learn that the tower was becoming dilapidated in Queen Elizabeth's time, as on her last journey through the town she noticed it, and gave orders to the Archbishop of Canterbury, and through him to the proper officials, to have it put into good order, which was done. The roofs of nave and south aisle were tiled, and the gutter between them was remade in 1551-2 at a cost of 34s. 4d. The walls inside were plastered and covered with painted decorations. There were two roodlofts in the church, with small and great candlesticks, the latter being termed "standes"; also brass pots and bowls, and the sum of 7d. is recorded for keeping them bright. There was also a tabernacle over the stone altar, and there were thirteen images in the church. When the east wall was pulled down recently for the erection of the new chancel, some portions of the earlier church were met with in the rubble lining, including fragments of tracery and a damaged consecration cross. The order for keeping parish registers was issued by Thomas Cromwell in 1538, but the earliest mention in the churchwarden's accounts is under the date 1547-8, when the sum of 2s. (ij's) was paid "for Kepinge the boke of Weddinges, Chrystenyngs and Burialls for ij yeres." No trace of these registers remains, as the parish registers of Wandsworth only commence with 1603. Wandsworth was one of the thirteen churches in Surrey wherein two organs were found by the Royal Commissioners. There are many references to the sale of church goods in Edward the Sixth's reign, and in the next reign the parish is put to the expense of replacing some of them. Many also are the entries of payments made for the destruction of stained glass, for pulling down of the rood-lofts, for the whiting of the church and the putting out of pictures, &c. Mr.

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Astley, Mr. Gould, Mr. Williams, Mr. Kayso Mr. Patrick and the chairman took part in the discussion which followed this most interesting paper, and Mr. Davis was warmly commended for the care and accuracy with which he has compiled the records of ancient parish life.

Illustrations.

WESTMINSTER CATHEDRAL: THE APSE.

THIS illustration is from a monochrome brush drawing made by Mr. W. Curtis Green, from sketches taken on the spot. It shows the exterior treatment of the apse of the cathedral, and the graceful and original towers which flank it. This is what according to English ritual would be the east end of the cathedral, but in this case is the south end, the Catholic Church, as is well known, not attaching any importance to the east and west alignment of the building.

The drawing was intended for publication, with others, in our issue reporting the presentation of the Institute Gold Medal to Mr. Bentley. It can now, unhappily, only be published as an *in memoriam* illustration.

DESIGN FOR A SWIMMING BATH.

THIS design, by Mr. Lionel G. Detmar, is the one which obtained from the Institute the medal of merit in the last Soane Medallion Competition, and is in many respects a very meritorious design.

The following are the author's notes as to his intentions in the design :—

"The above subject for the Soane Medallion offered unusual opportunities for architectural effect, of which I have endeavoured in this design to take advantage, while avoiding such extravagance of plan or lavishness of scale as would render the realisation impracticable.

The main entrance is placed on the long side for effect externally, and for making the dressing-boxes more readily accessible from the entrance-hall, though a more effective entry to the bath-hall is, undoubtedly, through the extra exit placed at one end.

Immediately on entering the building a vista is obtained across the octagonal vestibule, with its central fountain, closed in by the stone screen containing a group of statuary, which would be seen against the background formed by the water in the bath and the far side of the bath-hall.

The stairs to the public galleries are to the right and left, and so arranged that by closing the sliding doors across the hall, the public could be entirely excluded from the ground floor of the building on the occasions of displays in the bath, the same pay-boxes still being made use of.

The vestibule is so placed that every part of the building is entered directly therefrom, and forms, therefore, a species of "Salle des Pas Perdus" on a small scale. The reading and smoking rooms right and left are shut off by cross-ventilated lobbies from the noise and atmosphere of the bath, and the lavatories and bath dressing-box corridors also are entered direct.

The vestibule is planned with its chief architectural effect on the gallery level, as this would be the part used by the public at entertainments, and is treated with a large circular well for lighting the ground floor.

The vestibule forms the central feature of the front elevation, flanked right and left by the low blocks of the reading and smoking rooms, with the low entrance-hall block in front and the bath-hall rising at the back. Thus every department of the building would be visible, and easily recognisable from the road.

With regard to the bath hall itself, the dressing-boxes have been subordinated to the architecture, being screened by a colonnade, but are not kept so far away as to be impossible of supervision, which is necessary for the avoidance of theft. The provision of a 'dressers' corridor' behind a colonnade would minimise the objectionable splashing inevitably caused by persons still in the water.

The main entrance is intended to be on the sea-front; this being one of the conditions. The bath was to be a fresh-water one, which is the more desirable after sea bathing.

The engine-house would be in the basement, under the vestibule."

BAPTIST CHAPEL AND SCHOOLS, TWERTON,* BATH.

THE portions of the buildings herein illustrated, which are now in course of erection, consist of the chapel, vestries, &c. and the infants' classroom; the remainder of the scheme will be carried out at a later date. The chapel, which has three galleries in addition to the choir gallery, affords accommodation for 575 persons, and the classroom accommodates sixty infants. The building has been designed in keeping with the traditional Bath style, and is entirely of stone with green slated roofs.

The architects are Messrs. Silcock & Reay, of Bath, and the work is being carried out by Messrs. J. Long & Sons, of the same city.

* 'Tiverton," in the title of the plate, is a misprint.

HOUSE AT BUXTON.

THE house here illustrated was recently erected from the designs of Messrs. Chas. Heathcote & Sons, architects, of Manchester.

The situation is a particularly good one, with wide views of Axe Edge and the high hills on the border of Derbyshire and Cheshire. The house was designed for four entertaining rooms, but this accommodation was cut down in erection to three. The billiard-room has a large and deep fireplace recess or nook, and is used as an inner hall with a billiard table. The outer walls are of rubble stone, faced with Huddersfield parpoints and lined throughout with brick. The roofs are covered with red semi-vitreous tiles, laid on felt. The house is warmed throughout by low-pressure hot water, put in by Mr. Hatton, of Manchester.

The builders were Messrs. Southern & Sons, of Salford. The masonry was executed by the late Mr. Gladwin, of Buxton. Stabling and greenhouses are situated in the rear of the site.

THE SURVEYORS' INSTITUTION:

THE INSURANCE OF BUILDINGS AGAINST FIRE.

AN ordinary fortnightly meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Westminster, the chair being occupied by Mr. Arthur Vernon in the early part of the proceedings, until the President, Sir John Rolleston, M.P., arrived.

Mr. Penfold, hon. secretary, announced some donations to the Library and the Library Fund, and a vote of thanks was accorded to the donors on the motion of the Chairman.

Mr. C. H. Bedells then read a long and interesting paper on "The Insurance of Buildings Against Fire." After some preliminary observations, he said that from the Great Fire of London in 1666, fire insurance, as a system, might be said to date, and to Dr. Nicholas Barbon seemed due the credit of inaugurating, in 1667, a practicable scheme of insurance for London and its environs. In addition to founding this scheme, Dr. Barbon was one of the largest builders of the new city which arose on the ashes of the Great Fire. It was not until 1710 that insurance offices covered country risks.

The author then considered certain questions which arise in ordinary insurances of building property, the first being the determination of the amount of the insurance. In most cases, he said, it would probably be correctly taken as the cost of erecting a similar building at current prices, but it must be remembered, on the one hand, that policies of insurance often last for very many years and are not revised from time to time as they should be, therefore, some little margin to cover the general increase in cost of labour and material might in many cases be desirable, while, on the other hand, the fact that it often happened that the cost of a building and its insurance value differed widely must be taken into account. If the building was very old it was not worth while insuring up to the figure which the reinstating of the old building at present-day prices would give, if the insured was upon the happening of a loss to be met by a refusal to pay more than the "actual value of the old building at the time of the fire." Again, unless the property was to be covered by an average policy, the element of the proportion which the indestructible part of a building bears to the whole might properly be taken into account. Another element which had to be taken into consideration was the possibility, or otherwise, of reinstating the building if destroyed on its present lines in view of the application of building legislation not in force when the building was originally constructed. He would take a typical case—that of a building used on the lower floors for business purposes and on the upper floors as flats. There was, say, no fireproof floor nor proper isolated staircase nor entrance for the upper part. A fire destroying this building (assumed to exceed ten squares in area) to an extent sufficient to bring the reinstatement within Section 74 by the operation of Section 209 of the London Building Act, 1894, would inflict a money loss on the owner of, say, twice or three times the cost value of the materials destroyed in certain parts of the building, and if insurance was to be an indemnity, this additional liability ought to be covered. When the principle was determined, the fixing of the insurable value was often one of some difficulty. When whole streets of buildings were carried out after a uniform plan, and differed not essentially in details, the problem was easy and the necessary records and memoranda as to cost few. At present he supposed the bulk of estimates for insurance (except in the case of new buildings of which cost detail was at hand) were based upon a foot cube price, applied with more or less care and discrimination, though special buildings might be valued on rough approximate quantities, where, by reason of heavy rates of premium, any considerable margin for contingencies was inadmissible; or where, by reason of the magnitude of the risk, an error of judgment in determining an appropriate foot cube price would have very serious consequences.

The next point was the description of the property. It was important that careful consideration be given to the description of the premises, the precise information to be supplied to the office for the policy. Any surveyor arranging policies was responsible if they were useless, whether he was paid for the work or not. Material misrepresentation by the agent of the assured, whether due to fraud or to negligence, might be fatal to the policy; or if the assured, or his agent, accepted a policy without examination, the assured could not recover if the description could not be applied to the property burned, although the information and particulars were not supplied by him. The distinction to be drawn between mere representation and warranty was of great importance. It had been decided that there must be some element of fraud, wilful falsehood, or gross negligence in representations in an application for insurance before these would void a policy unless an express warranty was given; but if a representation was converted into a warranty by express stipulation it was then enforceable literally; good faith, or honesty of purpose would not excuse an error in such a case; the statements must be literally true or the warranty was not fulfilled. It was not always enough that the statements made were true; they must cover all facts material to the risk, and if they failed to state facts, which they should know to be material to the risk, the policy might be rendered null and void. It was well to remember that a representation of present condition and use was not, by itself, a continuing one or a warranty for the future, unless the intention of the parties was clearly manifest—*e.g.*, to a question, "How is the building warmed?" the reply, "No stoves used," was not a statement that there would not be any, nor did, "In the occupation of 'so and so,'" warrant that the premises would so remain. In cases of doubt the company should be induced to inspect the premises; their doing so would be a material factor. A question which often arises was: Is it needful to separately describe and insure outbuildings? His experience was that even when these were small a separate insurance was often asked for by the insurance company, and the printed conditions of the tariff offices required it where the buildings were detached, or, if adjoining, did not communicate internally, but he did not know of any English decided cases.

The author then considered the subject of additional risks during the currency of a policy. They were very various, but a few of the more common he referred to. (1) Building works, alterations, and repairs. When did notice become needful? He thought, so far as repairs are concerned, it might be said that "any increase of risk incident to the making of reasonable and necessary repairs is part of the general risk assumed by insurers," but that the safe rule was to notify building operations whenever the risk was thereby increased to any material extent. Fire insurance was very often loosely dealt with in building contracts. When the work consisted of substantial additions to existing buildings it was not without difficulty. The problem was to keep on foot the existing insurance, covering the additional

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temporary risk, to cover the added value, and to this extent to protect the client and the builder who was under liability to complete the work. He had reason to know that in many cases the covering of the additional temporary risk on the old policy was altogether neglected, and an independent policy was taken out by the builder. Proceeding, the author said: "The second part of the insurance clause of the Royal Institute of British Architects' form of contract deals with cases of this kind, as follows:—

'The whole building and the works executed under this contract shall be at the sole risk of the employer as regards any loss or damage by fire, and in the event of any such loss or damage being so occasioned which affects the original building or structure, in addition to the new work, the contractor shall be entitled to receive from the employer the full value of all work then executed and materials then delivered, calculated in the manner provided for by Clause 13 hereof, and this contract, so far as it relates to any subsequent work, may, at the option of either party, be determined if in the opinion of the arbitrator such determination shall be just and equitable.'

This clause as it stands appears to me to be open to objection, because the contractor has no liability for insurance or responsibility in case of fire, and if such a clause is adopted it seems to me there should be a supplementary clause making the contractor responsible for doing or suffering nothing to vitiate the employer's policy. It is desirable, I think, in all cases, unless special circumstances prevent it, that the taking out of the policy, so far as the building works are concerned, should rest primarily upon the contractor, because he then is clearly aware of any stipulation made by the office, such as the absence of braziers for drying plastering, and he alone is in the best position to give any notices to the office as to such matters, and to comply with any requirements arising out of such notification, and this should be his responsibility. If, however, a builder takes out the necessary policy, might it result in his having an interest in the old buildings and an implied right to carry out their reinstatement? If so, it would be better, rather than to leave the insurance in the contractor's hands, for the employer to assume the responsibility of insurance and to make the builder responsible only if the insurance is invalidated by his act or default. The right to determine a contract in such a case on equitable terms would seem desirable, and in this respect the clause is a good one. I have seen it broadly stated that 'a fire happening on a building where a contractor is engaged excuses him from his contract,' but I do not know on what authority the statement rests, or the extent of its application. . . . The Royal Institute of British Architects Clause, Part I., relating to new buildings is a good one. The introduction of electric light requires the knowledge and sanction of the insurers. The regulations adopted by the Phœnix Fire Office are usually adopted by the other companies and are generally understood. The introduction of machinery and its motive power requires to be specially covered and the description to be full and accurate. Notice should be given and consent obtained before permitting the occupation of any premises for any trade known to be hazardous. . . . Apart from special condition or warranty alterations of user only void a policy in case the risk is thereby materially increased, which is a fact to be determined by a jury. The memorandum of trades, &c., added in a note to some conditions, give a clue to what occupations, &c., are, in the opinion of the offices attended by additional risk. . . . . The tariff office conditions usually confine notification of increased risk to the property insured, but some of the English, and many of the American, office policies require prompt notice of hazardous buildings near the subject of insurance or of the user and occupation thereof, just as some of them require notification of premises insured becoming unoccupied. The matter of the proximity of hazardous occupations is often a very serious one, and it seems strange that there should be no redress under circumstances such as these. A man may come and occupy premises adjoining my own and carry on a lawful but hazardous trade, and by reason of such business my insurance premium may be doubled or trebled. I am told that unless there is negligence or improper procedure on his part I have no claim or ground of action against him. . . . ."

The author then considered the happening of a loss and the settlement of the claims so arising, and some of the matters and circumstances which may complicate proceedings in a claim—(1) Effect of legislation; (2) Existence of other insurances, including "average" policies; (3) State of repair and age; (4) Fixtures.

"(1.) How to arrive at measure of damages when by reason of legislative enactments the subject matter of insurance cannot be reinstated on old lines. To take a concrete instance by way of example—a recent case of my own. A warehouse building was partially destroyed. It had two stories in the roof; the roof was at an angle of 60 deg. with the horizontal. By the Building Act of 1894 a warehouse roof must not exceed 47 deg. with the horizon (Section 61, Subsection 3). The result, if the roof were reconstructed, meant a loss of floor space on top floor, and loss of floor space with headroom on both floors. The contention of the assessor of the fire offices concerned was this: 'We will give you the cost of a new roof, and nothing more; if it cannot be replaced on the old lines that is not our fault, and our liability ceases when we have done what is lawful and possible.' I contended that this was not the case, but that in addition to the cost of such reinstatement as the law permits, the assured is entitled (if the amount of the policy is not exhausted) to an allowance for the less value the building will be to him when so partially reinstated. I based my contention to a considerable extent upon the old case of Alchorne *v.* Savill, 4 L. J. R. Chan. 47, a case of which the assessor had never heard, and the report of which he was, he said, unable to trace. I was ultimately, after consultation with the district surveyor, able to effect a satisfactory settlement, and the question had not to be further contested. I, however, sent to the assessor sufficient particulars of the case I had quoted, which he acknowledged, but did not discuss. . . . Then take another instance already alluded to, which raised, not only the question of less value of reinstated premises, but also the greater cost of reinstatement. The premises were used for purposes of trade and for dwelling also: The London Building Act requires in such a case a fire-resisting floor, a properly enclosed fireproof staircase, &c., neither of which existed in the old building. The Company's representatives say we do not profess to cover such a risk, because if a fire happens and the premises are rebuilt it would give the insured a better building than before, and if a fire happens we say, that the measure of our liability is the cost of reinstating on the old lines, and the insured must find the difference. It may be granted that the result is a more costly building, and in some respects more substantial, but not necessarily a more profitable building, often less so. I contend that, so far as the amount of the policy extends, the company should be, and, I think is, liable to comply with new requirements. . . . There is another indirect and contingent liability following upon fire, which should, perhaps, be referred to here. It is now, I believe, the custom of the London County Council in all cases of fire arising in manufacturing premises, to instruct the district surveyor to report what alterations ought to be made to the premises to comply with the general regulations of the Factory Acts 1878-1895, and following upon such report requirements more or less serious are made. One of these notices is at present before me. The owner of the building feels that but for the fire no such requirements would have been made, as only applying to buildings the construction of which is commenced after January 1, 1892, and thinks the cost of compliance should come out of the fire insurance. In this case, however, such a contention could hardly, I think, be justified, because the requirement is not in respect of the building *quâ building*, but of the occupation of the building. It might be possibly a point for argument if the building were expressly insured by the insurance company as a factory for a particular business, but I should judge the case is too remote. There is another point which may properly come in here, as illustrating the difficulty of adjusting claims on account of legislative interference. The power of a district surveyor to make requisitions as the work goes on. Sometimes a district surveyor will go out of his way to assist you, and will say, 'I shall require so much of that wall to come down,' and 'that wall may remain if you put such and such piers'; but sometimes a district surveyor will decline to determine until pulling down proceeds, and the surveyor claiming has either to claim for work which may not be required or run the risk of accepting an amount which may hereafter prove inadequate. . . . . I am aware that after a claim is adjusted, but before it is settled, the insured may prove that he has left something out of his claim, and the adjustment would not be binding, but would this be so if the money had actually been paid and accepted in discharge? The companies cannot in such a case get back money paid in mistake. Is the insured in any more favourable a position? . . ." In reference to the age and state of repair the author said:—"It is argued, I believe, by some assessors that this clause: 'The value at the time of the fire of the property destroyed' permits the offices to deduct from the amount of ascertained loss such a sum as would represent either the depreciation in value by reason of the age of the building, or such a sum as would have been required at the time of the fire to put the property destroyed into thorough repair. It has even been contended that an annual depreciation percentage should be taken into account, but I think that unless distinct actual and substantial detriment can be shown no such deduction is claimable. . . . On the other hand, if the property insured is a worn-out and very dilapidated building, the insured is, of course, not entitled either to the original cost, or the sum needful to erect a new one. The case of Yates *v.* Dunster (24 L.J. Ex. 226, April, 1855) was an action for damages against assignee under covenant to repair. The jury found that 1,635*l.* would be the cost of rebuilding, but that the new building would be worth 600*l.* more than at the time of the fire; 84*l.* had been expended to meet the district surveyor's requirements, 1,000*l.* was recoverable under an inadequate policy. The result of the case was judgment against the assignee for 119*l.* = 1,635*l.* + 84*l.* (1,000*l.* + 600*l.* [the surplus value of the new building]). As to ordinary repairs, such as the need for a coat of paint, if these were not so material as to make the property of substantially less capital value, I doubt whether they can be taken into account. A question sometimes arises where a building, though substantial, is old and unsuitable for its locality. The value of the building *quâ* structure may be considerable, but its value as it stands viewed as an earning property may be small, and the building and site together, little more than the value of the site itself. It has, indeed, been contended that in such a case the excess of value over the value of the cleared site is the criterion and measure of damages, but this is, I think, an erroneous view, and that if the office elects not to reinstate, the claim is the actual value of the building, and not its relative value. The office has nothing to do with the question how the insured applies the money paid to him. The state of repair sometimes increases the responsibility of the company. I had a case a little time ago where a fire occurred in an extensive stable loft, the front wall of the building had been dragged out of the perpendicular by the erection of a heavy pent roof which had been tiled. The only thing which held the premises together was the existence of certain bond timbers which had been bedded into the cross walls. Some of these had been utilised to form the fixing for straps and iron plate washers to hold the front up. Some of these bond timbers were badly charred by the fire. The company contended that their liability only extended to replacing them, and that if in doing so the District Surveyor condemned the structure or declined to allow them to do so they were not responsible. I contended that but for the fire no such question would probably have arisen, and they must either reinstate the ties themselves and the burnt woodwork or pay a sum sufficient to cover the cost of the work, and to satisfy the District Surveyor. The company carried out the reinstatement, rebuilt the upper part of the wall, and reconstructed the pent roof, and, I think, they could have been compelled to do this." As to fixtures, the author said:—"Questions often arise as to how far the policy of insurance on premises covers the fixtures therein apart from express description. It will, no doubt, depend largely upon the wording of the policy, and in most cases the policy would give some indication of intention. Thus, where premises were insured as a starch manufactory, it was considered that it would include fixtures necessary to the process carried on. Similarly a mill.

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As to business premises generally such items as shelves and counters would probably depend upon the question whether they are movable or immovable fixtures. Take the case, for instance, of licensed premises. The trade fittings should, in my opinion, clearly be insured in a separate policy unless they belong to the freeholder of the premises." He then referred to one or two specific points of some importance, to be borne in mind in negotiation with an assessor.

"(1) *Total loss.* A total loss does not mean the annihilation of all the materials, but the destruction of the premises insured *as a building*. . . . . (2) *The company's right or obligation to reinstate.* The companies now, for the most part, reserve to themselves the option to pay or to reinstate; but it was not always so. In the early days of insurance the option was sometimes mutual, and sometimes the insured had to elect, on taking out the policy, whether, in case of a loss happening, the company should pay or should reinstate. Under certain circumstances they can be compelled to reinstate. The Act of 14 George III., cap. 78, is still in force as to Section 83, and it requires the insurance company, upon the request of any person interested in or entitled unto any house or houses or other building which may be burnt down, demolished, or damaged by fire, or without any such request and upon any grounds of suspicion of fraud or arson, to cause the insurance money to be laid out and expended, so far as the same will go, towards rebuilding, reinstating, or repairing. As an alternative, there is a provision for the insured to give approved security for the due expenditure of the money. . . . . It is to be borne in mind that the companies' election to reinstate may involve them in serious responsibility not even to be measured by the total amount of the policy of insurance. For instance, if partial reinstatement is effected, the measure of damage is the cost of completion—irrespective of the amount of the balance of the policy, and in view of this fact it is not surprising that the companies do not often take advantage of this particular option. The election to reinstate makes the company liable for damages as for breach of a contract to build, and if the company having elected to reinstate the authorities make requisitions, involving extra outlay, still the company must comply or pay damages, not only for failure but for delay. There is a very strong case as to this—Brown *v.* Royal Insurance, Ellis *v.* Ellis, 853, where the authority condemned the building as dangerous and required it to be taken down. The company was held not to be relieved from liability, although the dangerous condition of the building was not caused by the fire. One of the judges dissented in this case, because he considered the company could not be made to give improved premises, but the view of the majority was that the company was bound by its election, and if the performance had become impossible or (which was all the company had shown) more expensive than was anticipated, still it must either perform the contract or pay damages for not performing it. I should be glad to know whether the company's right to reinstate ceases as soon as any steps are taken with a view to arbitration. It would be very desirable if the duration of the option on the company's part were generally determined by policies, as it is by some; for it must be remembered that so long as there is this option the insured must not proceed to execute repairs himself, or if he does he cannot recover his expenditure from the company. When under conditions of policy the insurance money is payable a certain number of days after loss, the company's option ceases at such date as a right of action then accrues. It may so happen that the company may proceed to reinstate, and may by mistake alter the premises, if so, it is the company's responsibility. To meet this difficulty in the conditions of some offices (*e.g.*, The Sun) there is a provision that the insured shall at his own expense supply or produce all plans, specifications, measurements, documents, books and information requisite to a reinstatement. Reinstatement being thus attended with serious responsibility it is not lightly entered upon by the companies; they will usually fall back upon arbitration procedure. The principle of arbitration in these matters goes back to the year 1727. In the form in which the condition now usually appears, the obtaining of an award is a condition precedent to a right to recover unless the company deny *in toto* the right of the insured to recover. I consider that the condition which in some companies' policy form provides that the costs of an arbitration, including the arbitrator's award, should be equally borne by the insured and the company is a most onerous and one-sided one. The costs of an arbitration are a very different matter to a wealthy company, as compared with what they would be to a private individual insurer, and I consider that in all cases the costs should be in the discretion of the arbitrator. . . . Assuming a deadlock in negotiation, who is responsible for the building? I think the company is, and if delay occurs on their part and damage occurs to adjoining premises, that they are responsible. I suppose, also, they are responsible if any damage arises to the public after a fire, and for the adequacy of shoring if the buildings are in their charge. . . ."

In conclusion, the author suggested the following for consideration:—

"1. The encouragement of fire-resisting construction by preferential rates, and the issue by all offices of information as to matters which, in their opinion, increase risk, and therefore premiums, and of such as would minimise risks. The encouragement of fire-proof construction by preferential rates differs from, and is the converse of, one object of the tariff system, which is defined as being to affix 'such a penalty to dangerous constructions, substances, and processes as to induce, if possible, a lowering of the danger.' Nor does the issue of revised rules for standard fire-resisting buildings, though a commendable and most useful step, go far enough to meet the requirements of the case.

There are, as Mr. Douglass Mathews pointed out in a recent volume of *Professional Notes*, very numerous cases where a standard fire-resisting construction is considered prohibitory, but where, short of that, many reasonable precautions and expedients could be adopted; and it seems to me it would, as he pointed out, be a very useful thing if it were the general practice to submit plans of buildings likely to be the subject of exceptional rate of premiums, before those buildings are erected, to a surveyor appointed by the companies, or some of them, for that official to make suggestions with a view to reduction of risk, coupled with the understanding that in the event of his suggestions being adopted he would report to the company in whose office it might be proposed to insure the building the extent to which the ordinary rate for a building of the class in question might reasonably be modified in consideration thereof. As matters now stand there is often great dissatisfaction because adequate allowance does not seem to be made for what is done in the direction of fire-resisting construction or automatic apparatus. The more frequently such a procedure is adopted, the sooner would, I think, office and clients alike find in it a mutual advantage, because clients are much more likely to incur expenses in this direction if the suggestions are practicable ones and are coupled with a definite prospect of material reductions of rate. It can hardly be said that the time is not ripe for such a step. The accumulated experience of the offices, and the accumulating results of numerous experiments by the Fire Prevention Committee, surely afford a basis for the practical discussion of such a scheme.

2. A definite pronouncement of the companies' intentions as to matters as to which at present uncertainty may exist, such as the covering of all losses and expenses other than of profits, falling upon a building-owner arising beyond his control, and the definite insurance of all such bonâ-fide losses.

3. The giving by the companies of at least fifteen days' notice of their intention to decline to renew a policy involving a risk hitherto insured and about to expire. It is often difficult to cover, at short notice, a hazardous risk, and if it is a fact, as I believe it has been decided to be, that no claim arises against an insurance company by the operation of the 'days-of-grace' provision in a case in which the company have notified their intention not to renew, a reasonable and defined notice, it seems to me, ought to be incumbent upon the company. . . . I think it might be argued that it is to the interest of the community that manufacturers should be able to insure themselves at rates which, while necessarily high for dangerous processes, are not absolutely prohibitive, and certainly that the risks which cannot be covered, if any, should be few. If so, then has not the community a right to look to the companies for consideration of the subject, not from the companies' standpoint alone? I think it has, and also that if the companies are as wise as they are powerful they will heed the signs of the times. The large expenditure made by the community in the maintenance and improvement in the efficiency of fire brigades, and also in compliance with more stringent enactments made with a view to decreasing the risk and extent of fires, demands some return from the offices who benefit so directly by such expenditure, and there is a widespread view that this demand is not met. One point in connexion with the recent appeal to the City Corporation struck me as very forcible, viz., that as compared with 1865, when the contribution now payable by the offices to the County Council for fire brigade purposes was fixed, the proportion of fires reported as serious and involving considerable loss has fallen from 25 per cent. to between 3 and 4 per cent., and this although conflagrations are at present reported as serious which would not have been so described thirty years ago. . . ."

Mr. Howard Martin proposed a vote of thanks to the author for his excellent paper, and Mr. Douglass Mathews seconded, and also moved the adjournment of the discussion. The vote of thanks and the motion to adjourn having been agreed to, and Mr. A. B. Hudson having made a few remarks, the discussion was adjourned until the 24th inst.

CARPENTERS' HALL LECTURES.

THE subject selected by Professor Ramsay, F.R.S., for his lecture at the Carpenters' Hall on the 6th inst., was "The Bearing of Modern Chemical Theory on some Problems connected with the Building Trade." The lecturer observed that the massive walls of buildings, which are usually regarded as essentially solid, are in reality largely composed of liquid and gaseous matter, for all descriptions of stone, brick, and mortar contain considerable quantities of water, and are permeated with innumerable pores or channels filled with gases and water vapour.

The investigations of Dr. Horace Brown into the rate of flow of gases through the perforated cap of a cylindrical vessel were described, and it was stated that the rate of flow is not proportionate to the area of the orifices in the cap, but is proportionate to their diameters. A remarkable fact revealed by Dr. Brown's experiments was that gases flowed into, or out of, the cylindrical vessel more rapidly when it was covered with a cap having a large number of small orifices than when the top of the vessel was left entirely uncovered. A practical application of this scientific discovery is seen in the provision of perforated plates or baffles over chimney-pots to prevent downdraught. The rate of flow of the combustion products escaping from the chimney is increased by the presence of the perforated plate, and the interior of the chimney is at the same time protected to a certain extent from the action of gusts of wind.

Adopting a favourite phrase of the ancient philosophers, "Nature abhors a vacuum," Professor Ramsay said that liquid and gaseous matter always has a tendency to flow into a vacuum, or into a space devoid of similar matter. It was shown that a bladder filled with gaseous carbonic acid gradually collapsed because the atmosphere in which it was suspended was practically devoid of carbonic acid, and the attraction of the gas towards the vacuum was sufficiently strong to cause carbonic acid to flow through the walls of the bladder. The same bladder filled with air would not collapse, because the air or gaseous mixture by which the bladder is surrounded being of the same composition as the contents of the bladder, would not act like a vacuum.

A large proportion of the surfaces of bricks and building stones consists of the open ends of irregular channels, and the irregularity of these channels interferes with the laws which govern the rate of flow, but there is nevertheless a perpetual flow of gases and water vapour through these channels. When the external air is drier than that within a building, the damper air from the building flows through the walls into the atmosphere and tends to dry the building. When the external atmosphere is damper than that within the building the water vapour flows through the walls towards the drier air (or partial water vapour vacuum) and tends to make the building damp.

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In a new building the water and soluble salts contained in the material used for construction flow to the surfaces of the walls, where the water evaporates and leaves the salts in the form of a white efflorescent deposit. The escape of water vapour from stone or brick is aided by the flow of dry gases.

Professor Ramsay said that it is a common practice to attempt to hasten the drying of new buildings by leaving the doors and flues open, but he thought it would be more rational to close these vents, and to use charcoal braziers in the closed rooms. The hot gaseous carbonic acid evolved from the burning charcoal would flow through the walls, and the carbonic acid would materially accelerate the conversion of the lime in the mortar into carbonate of lime. The rate at which the lime in mortar is converted into carbonate of lime increases with the temperature, and the passage of the hot carbonic acid through the walls would therefore not only dry out the water but would increase materially the rate of conversion of the lime into carbonate of lime.

Dr. Kennedy, F.R.S., who occupied the chair, in proposing the vote of thanks, which was cordially given to Professor Ramsay, aptly summed up the lecture by saying that Professor Ramsay had demonstrated that the substances which practical architects and builders are accustomed to regard as sound and solid building materials consist merely of a combination of holes.

THE LONDON COUNTY COUNCIL.

THE statutory annual meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. A. M. Torrance, the retiring Chairman, presiding.

The New Chairmen.—Earl Carrington proposed as Chairman for the ensuing year Mr. J. M'Dougall, whom he eulogised as a man of great capacity and industry, genuine modesty, and blameless life. The Council offered him the chair as a reward of faithful services in the past.

Mr. Hubbard seconded the motion, which was supported by Mr. Campbell, and carried unanimously.

Mr. Torrance then vacated the chair, which was taken by Mr. M'Dougall.

On the motion of Mr. Cornwall, seconded by Sir J. West, Lord Monkswell was elected to the vice-chairmanship.

Mr Alliston moved, and Mr. Dodson seconded, the election of Mr. H. Clarke as deputy-chairman, which was duly carried.

A New County Hall.—On the Council proceeding to the election of the Committees for the ensuing year, Colonel Rotton moved that the Special Committee on New Offices be not appointed, and that the reference to that Committee be transferred to the Establishment Committee. He remarked that it was impossible for the Council to obtain any information with regard to that Committee, and they appeared to be no nearer obtaining new offices than they were twelve years ago.

Mr. Beachcroft, in seconding the amendment, pointed out that they had now a staff of 805 scattered about, and, although the Special Committee had been appointed two years, they had not yet reported.

Mr. Pigott observed that the cause of delay was because both parties "funked" spending 2,000,000*l.* of money on new offices.

The amendment was defeated, and the Committee elected.

It was agreed, on the motion of Mr. Crooks, that the Committee be instructed to bring up a Report before the Whitsuntide recess.

The Forthcoming Rate.—Lord Welby said many inquiries having been made, on behalf of the Councils of the Metropolitan Boroughs, as to the probable amount of the County rate for 1902-3, he was authorised by the Finance Committee to state that, so far as could at present be foreseen, and subject to further consideration by the Committee and to consideration by the Council after Easter, the rate would probably be 15½d. in the pound, viz., 12⅝d. for general county purposes and 2⅝d. for special county purposes. This rate would be an increase of ¼d. upon the rate of the present financial year, and he might say generally that the increase was accounted for by the larger annual charge for interest and repayment of debt.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Greenwich Borough Council 4,800*l.* for the purchase of property for a wharf and cottages in Norman-road; Stepney Borough Council, 4,250*l.* for contribution to cost of street improvements; Woolwich Borough Council, 1,350*l.* for electric light installation; Camberwell Borough Council, 35,000*l.* for purchase of land for a cemetery; Stoke Newington Borough Council, 2,000*l.* for contribution towards cost of purchase of Alexandra Park; Camberwell Guardians, 13,210*l.* for erection of homes for children; Holborn Guardians, 2,500*l.* for provision of steam-boiler plant; and St. Marylebone Guardians, 4,240*l.* for purchase of premises.

Camberwell School of Arts and Crafts.—The Technical Education Board recommended the Council to take on lease from the Camberwell Borough Council the premises of the local school of arts and crafts, including new buildings to be erected by the Borough Council, at a rent not exceeding 300*l.* a year, for a term of years from seven to sixty, at the option of the County Council.

The solicitor was instructed to make the necessary arrangements.

London University.—On the motion for the reception of the Report of the Technical Education Board, dealing with the reorganisation of the University of London, Mr. Macdonald called attention to the growing relationship between London Polytechnics and London University, and such a relationship was, he believed, opposed to the best interests of technical education. He contended that polytechnics should be organised and controlled from the point of view of the workshop, and not from the point of view of the University. What they wanted was to increase schools of craftsmanship, and not increase the number of Bachelors of Science and Doctors of Science.

Dr. Napier believed that in London there were greater facilities for workmen to educate themselves in their trade than in probably any town in the world.

Mr. Sidney Webb said it was absolutely untrue that craftsmanship had been neglected by the Technical Education Board. The first of the greatest works of the Board had been the multiplication and extension of craft classes. With regard to the London University, all the old facilities would be maintained for the education of those who were not wealthy.

The Report was adopted.

Widening of Piccadilly.—The Improvements Committee submitted a report on the suggested widening of Piccadilly between the Circus and Sackville-street, and gave the correspondence which had taken place between them and his Majesty's Commissioners of Woods and Forests, who are the freeholders of nearly the whole of the property which would have to be acquired for the improvement. The Committee pointed out that they have not succeeded in inducing the Commissioners to assist the Council in securing a much-needed improvement at anything but prohibitive cost, and they could not advise the Council to embark on an expenditure of 250,000*l.*, which it would entail. They recommended, "That in the absence of any undertaking from his Majesty's Commissioners of Woods and Forests to co-operate with the Council for securing, upon the expiration of the leases, and at reasonable cost, the setting back of the buildings on the Northern side of Piccadilly, the widening of that thoroughfare to 80 ft. between the Circus and Sackville-street be not undertaken by the Council."

Mr. Davis (Chairman of the Committee) said the Committee felt the improvement was a very important one, but they could not recommend it unless the Commissioners were prepared to assist. Under the circumstances they thought it better to bring the matter before the Council, in order that greater pressure might be brought to bear on the Commissioners.

Captain Hemphill hoped public attention would be drawn to the subject, so that the Commissioners might be influenced.

The motion was adopted, and it was resolved to communicate the decision to the First Lord of the Treasury, the Commissioners of Woods and Forests, and the Westminster City Council.

Belgian Rails.—In answer to Mr. Cousins, Mr. Benn said the Council had power, and there was no reason why the rate of pay and hours of labour should not be put in the tender of Messrs. Maclellan for the tramway rails to be made in Belgium.

Eltham Park.—The Improvements Committee recommended an expenditure of 9,350*l.* in the purchase of forty-one acres of the Eltham Park estate for the purposes of a public park, on the understanding that half the amount will be contributed by the Woolwich Borough Council. The cost of laying out the park was estimated at 10,000*l.*, and the annual maintenance at 2,000*l.*

The Report was adopted.

London United Tramways Bill.—The Highways Committee recommended that the Council should consent to the introduction of this Bill, provided it were limited to the construction of two short lengths of tramway at Hammersmith, which should be constructed by the Council, and become purchaseable by them in 1909. The report explained that a concession had been made to local feeling, as expressed by a petition and deputation, these short lines being required for linking-up purposes. The Committee's proposals were agreed to.

Roads and Sewers, Totterdown Fields Estate.—The Housing of the Working Classes Committee recommended that the expenditure of a sum not exceeding 9,000*l.* in respect of the sewer and temporary paving works on Section B of the Totterdown-fields estate be sanctioned; that the offer of Mr. F. J. Coxhead to carry out the work at the same schedule of prices as that on which his tender for similar works on Section A of the estate was based be accepted.

This was agreed to.

Furnished Rooms Let by Keepers of Common Lodging-houses.—The same Committee reported as follows:—

"The medical officer, acting under our instructions, has caused inquiry to be made into the number of furnished rooms let by keepers of common lodging-houses in London, and into the circumstances of the population inhabiting them. These rooms are usually situated in the neighbourhood of the common lodging-houses, and are let to persons requiring such accommodation. There were found to be 809 such rooms, 744 of which were let as single-room tenements, twenty-five as two-room tenements, and five as three-room tenements. These were occupied by 1,915 people, of whom 1,345 were parents or heads of families, and 428 were children under ten years of age. The total number of women was 704, of whom 619 had husbands living with them and 85 had not. The comparatively small number of children belonging to persons occupying these rooms is probably accounted for by the fact that many of the owners of the rooms either refuse to let to families with children, or only let to families with a limited number of children. The rents of the rooms varied, but 5s. or 6s. per week may be regarded as a common price for the single-room tenements. The furniture of the rooms is generally of a poor and meagre description. The inspector inquiring in the district of Stepney found instances in which the inmates, though paying for furnished rooms, possessed furniture of their own, but had adopted this course owing to the scarcity of unfurnished rooms. The dearth of accommodation is further evidenced by the small proportion of rooms vacant. Thus, at the time of inspection, in Stepney only seven rooms were found temporarily vacant out of more than 300 rooms visited. Several of the owners of rooms in this district stated that if they possessed double the number of rooms they could easily find tenants. The tenants occupying the furnished rooms did not appear to be migratory in the same way as many of the tenants of common lodging-houses. Thus in numerous instances the tenancy had extended to many months or even to two or three years or more. . . . ."

Repairing Carriageway, Westminster Bridge.—The Bridges Committee recommended, and it was agreed, that, subject to the passing of the annual maintenance votes, the Council do sanction the expenditure by the Bridges Committee of 4,300*l.* for repaving the carriageway of Westminster Bridge; that the offer of the Improved Wood Pavement Company, Limited, to execute the work be accepted.

Ground Plan of London—Detail Section.—The Corporate Property Committee reported as follows, their recommendation being agreed to—

"In connexion with the compilation of the ground plan it became necessary to survey some portions of London which had been developed since the ordnance survey in 1891, and as it was evident that more work of this kind would have to be executed in order that the several boundaries of estates might be defined, we were authorised to augment and extend this part of the work. Further, having regard to the long intervals between the revision of the ordnance survey it was felt that, if the sheets were made up to date and kept up to date, they would be made use of by solicitors, architects, surveyors, estate agents and others who could be furnished with a tracing of any particular property upon payment of fees to be hereafter determined, and in this way the work would become a means of revenue. For the sake

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of convenience, the ground plan work has been divided up into two sections, viz, the ownership and detail sections and the expenditure kept separate. The Council has already sanctioned the completion of the ownership section by March, 1904, at a total cost of 8,000*l.*, but with regard to the detail section has only sanctioned an initial outlay of 550*l.* for bringing the work up to idate, together with an annual expenditure of 200*l.* for keeping it up. The amount of work involved in the making up has been so much greater than was anticipated, that the valuer, basing his calculations upon the work done during the last three years, estimates the further cost at 500*l.* To show the whole area of London, 541 five ft. ordnance sheets are necessary, and on 236 of these the work of making up has been entirely completed, and partially finished in the case of 150. We feel that the keeping up to date of the 5 ft. ordnance survey must prove a great benefit to the public at large, while the value to the Council of such a plan will more than justify the increased cost. We recommend:—"That, subject to the passing of the annual maintenance votes, the Council do sanction the bringing up to date of the detail section of the ground plan at the estimated further cost of 500*l.*"

Annual Map of London.—They also submitted the following report:—

"This map, which will show the progress of building operations in London from year to year, was referred by the Council to us to prepare in connexion with the ground plan. The necessary expenditure incurred in its preparation is provided for by the Local Government Committee in their estimates. . . . It will also be useful to the Council for the purpose of fixing sites for new fire-stations, &c., and in arranging polling districts. This map and its completion is dependent upon that of the detail section of the ground plan. Now that another financial year is about to commence, it becomes necessary for the approval of the Council to be obtained to an expenditure of 380*l.* during the twelve months ending March 31, 1903. We recommend—That, subject to the passing of the annual maintenance votes, the Council do authorise the further expenditure by the Corporate Property Committee of 380*l.* (included in the Local Government Committee's estimate) in connexion with the annual map of London during the year ending March 31, 1903."

The recommendation was agreed to.

The Council adjourned shortly before eight o'clock.

ARCHITECTS' BENEVOLENT SOCIETY.

THE annual general meeting of the Architects' Benevolent Society was held on Wednesday at No. 9, Conduit-street, Regent-street, W., Mr. J. Macvicar Anderson presiding in the absence of the President, Mr. William Emerson.

The minutes of last meeting having been read and confirmed, Mr. Percivall Currey, hon. secretary, read the annual report, as follows:—

"At the last annual general meeting of the Architects' Benevolent Society the President announced that, owing to the pressing calls on the Society, the income account for the year showed a deficit of over 40*l.*, and that, in consequence, many cases had only been inadequately relieved. The President's statement called forth from Mr. Macvicar Anderson an offer to contribute 100*l.* to the funds of the Society if nine or any number of other donors would contribute sums so as to make the total amount 1,000*l.* Mr. Anderson supported his offer by making a special appeal to a few personal friends, with the result that more than the necessary sum was cordially and promptly subscribed. The President, Mr. Wm. Emerson, also brought the objects and position of the Society before the attention of the Royal Institute of Architects of Ireland and of the Societies allied with the Royal Institute of British Architects; and your Council have the satisfaction to report that donations or increased subscriptions were received from the Royal Institute of Architects of Ireland and the Aberdeen, Liverpool, Nottingham, Manchester, and Devon and Exeter Societies. The Council desire cordially to thank Mr. Macvicar Anderson and the President both for their generous contributions and for their individual efforts, by which they have so materially increased the prosperity of the Society. Thanks are also due to Mr. J. T. Christopher, to whose kindly intercession a donation of 21*l.* from the Worshipful Company of Salters is due. . . .

In consequence of the amount standing to the credit of the capital account—1,319*l.* 10*s.* 4*d.* having been received in donations and 1,500*l.* under the provisions of the will of the late Mr. Arthur Cates—purchases were effected during the year of 430*l.* Caledonian Railway 4 per cent. debenture stock and 2,606*l.* 7*s.* 5*d.* 2¾ per cent. Consols.

The increase of late years in the amount received in subscriptions has been steadily maintained, the total amount being 563*l.* 1*s.* 6*d.*, as against 522*l.* 0*s.* 6*d.* received in 1900. The growth of the Society's income has, however, been accompanied by increasing claims on its resources, and 813*l.* was distributed in pensions and grants during the period under review, as against 790*l.* expended in 1900. Out of the fifty-six applicants for relief, twenty-two were from Ireland and the provinces. It will be observed, from the accompanying statement of accounts, that the income account shows a deficit of 28*l.* 18*s.* 10*d.*

The Council have had under consideration the desirability of altering two of the by-laws. It is proposed to alter the wording of By-law No. 55 so as to bring it under the powers of the Trustee Act of 1893, by which the field open to the Society's investments may be enlarged without jeopardising the value of the security. In view of the additions to the capital account it is proposed to alter By-law 65, so as to increase the number of pensioners from six to ten. If this is carried into effect it will materially add to the happiness of a few of those who are dependent on the Society for yearly grants, by removing the feeling of uncertainty necessarily attached to this form of relief. Resolutions embodying the proposed changes in these by-laws will be submitted to you.

The Council desire to commend to your attention a proposal made by a subscriber, who has himself carried it into practical effect—viz., that the odd shillings received in fees by architects acting in arbitration cases should be presented to the Society.

It is with great regret that the Council record the irreparable loss sustained by the Society in the death of Mr. Arthur Cates. Mr. Cates was on many occasions a member of the Council, a position which he occupied at the time of his death. He acted from 1891-96 as the Society's treasurer, and its present financial stability is largely due to his exertions during that period; and he was one of the Society's trustees. Mr. Cates's interest in the Society was sustained until the last, and the handsome bequest of 1,500*l.* from one so familiar with its practical affairs is, your Council feel, both a testimony to the Society's usefulness and its needs.

The Council have also to record with great regret the death of an old subscriber and member of the Council, Mr. E. H. Martineau, and of Mr. J. M. Brydon, who had liberally responded to Mr. Macvicar Anderson's appeal.

The Council desire to nominate Mr. Aston Webb, A.R.A., for election as trustee to fill the vacancy caused by the death of Mr. Cates.

The following gentlemen, being the five senior members, retire by rotation from the Council:—Mr. T. M. Rickman, Mr. R. A. Briggs, Mr. Arthur Cates (deceased), Mr. E. A. Gruning, and Mr. G. T. Hine. To fill these vacancies the Council beg to nominate:—Mr. F. T. Baggallay, Mr. J. J. Burnet, Mr. J. H. Christian, Mr. R. St. A. Roumieu, and Mr. George Scamell.

The balance-sheet and income account for the year ended December 31, 1901, audited by Mr. J. T. Christopher and Mr. Henry Hall, are herewith submitted.

The Council of the Royal Institute of British Architects have granted office accommodation; and Mr. Locke and the other officials have been invariably helpful in any matter connected with the Society—services which are cordially recognised and appreciated."

The Chairman, in moving the adoption of the report and balance-sheet, said that the report was, he thought they would agree, satisfactory, but it recorded the death of one of whose loss the Council rightly used the word "irreparable," *i.e.*, Mr. Arthur Cates, who not only gave liberally to the Society, but devoted so much time and thought to its welfare. Two others had also passed away, *i.e.*, Mr. Martineau and Mr. Brydon, the death of the last-named being particularly sad. As to the finances, they must all feel gratified at the improvement of affairs, but he thought they should not rest satisfied. They must press on and do better, and still further improve the position of the Society. The income was not as satisfactory as it ought to be. The expenses of the Society were comparatively small, owing, to some extent, to the Institute giving them the use of their offices. A suggestion had been made as to increasing the income, and he would suggest that when an architect got anything like an important commission he should give something as a thank offering to the Society. If that were done it would result in a considerable increase in the funds of the Society.

The motion having been agreed to, and a vote of thanks accorded to the retiring members of Council (Messrs. T. M. Rickman, R. A. Briggs, E. A. Gruning, and G. T. Hine), Mr. T. M. Rickman moved that the members of Council for the year of office 1902-1903 be elected as follows:—Messrs. Zeph. King, G. Inskipp, J. T. Wimperis, Arthur Green, E. Monson, Sydney Smirke, H. L. Florence, Graham C. Awdry, J. T. Christopher, F. T. Baggallay, J. J. Burnet, J. H. Christian, R. St. A. Roumieu and George Scamell.

Mr. Ibberson seconded, and the motion was agreed to.

Mr. Aston Webb, A.R.A., having been elected a trustee,

Mr. H. L. Florence proposed, and Mr. Inskipp seconded, a vote of thanks to the hon. treasurer, Mr. W. Hilton Nash, and the hon. secretary, Mr. Percivall Currey, for their services, and also that they be re-elected for the ensuing year.

The motion having been agreed to,

Mr. Christopher moved:

"1. That By-law No. 55 shall be amended to read as follows: 'All legacies and all donations shall (unless otherwise directed by the donors) be laid out or invested under the direction of the Council, in or upon Government or other securities or investments in which a trustee may invest under the powers of the Trustee Act, 1893, or under any subsequent Act or Acts for the amendment of the same, or in or upon any security or investment for the time being permitted by the Chancery Division of the High Court of Justice, or any authority constituted in lieu thereof.'

2. That the first word in By-law No. 65 shall be altered from 'Six' to 'Ten.'"

Mr. Zeph. King seconded, and the resolutions were agreed to.

It was also agreed:

"3. That in By-law No. 41 the word 'week' shall be substituted for 'Wednesday.'"

A vote of thanks to the retiring auditors, Messrs. J. T. Christopher and Henry Hall, having been agreed to, Messrs. E. Buckle and G. Hubbard were elected auditors for the ensuing year.

On the motion of Mr. G. Scamell, seconded by Mr. F. T. Baggallay, a vote of thanks was accorded to the Royal Institute of British Architects for the use of rooms, &c.

A vote of thanks to the Chairman brought the proceedings to a close.

A general meeting of the Society will be held on Monday, March 24, to confirm the alteration of the by-laws.

ARCHITECTURAL SOCIETIES.

BRISTOL SOCIETY OF ARCHITECTS.—On the 10th inst. a meeting of this Society was held, the President, Mr. Frank W. Wills, in the chair, when Mr. Howard Chatfeild Clarke read a paper on "Ancient Lights." A vote of thanks was proposed by Mr. Wood, seconded by Mr. W. L. Bernard, and supported by Mr. Harold Smith. We hope to be able to print the paper in our next issue.

ARCHITECTURAL ASSOCIATION OF IRELAND.—At a meeting of this Association, held on the 4th inst., Mr. R. M. Butler in the chair, Mr. Marmaduke Purcell delivered a lecture on "Chemistry in its Relation to the Arts." The lecturer dealt generally upon the importance of a study of chemistry by children at school, for it tended to the encouragement of exactness, cleanliness, and thoughtfulness, but more particularly upon the effects which chemistry and its researches had had upon painting, opening up as it had done new processes in manufacture and general improvement of the chemical composition of materials.—Mr. F. G. Hicks proposed a vote of thanks to the lecturer, which was seconded by Mr. F. Shaw, and supported by Messrs. H. Allberry and S. Bradbury, and agreed to. Mr. Purcell in acknowledging the vote of thanks, gave replies and explanations to several questions raised by some of the members present.

EDINBURGH ARCHITECTURAL ASSOCIATION.—By permission of the Edinburgh and Leith Corporation Gas Commissioners, some fifty members of the Edinburg Architectural Association had an opportunity, on Saturday last week, of inspecting the new gasworks at Granton. On arrival the party after having a general view of the undertaking from the bridge at the south-east corner of the site, were conducted over the works by Mr. W. R. Herring, the Chief Engineer, who explained the leading features and purposes of the various buildings, the machinery and its uses, and generally the methods that will be adopted in gas production, &c., on the completion of the scheme.

THE STUDENT'S COLUMN.—Our Student's Column article ("Drainage," &c.) is held over until next week on account of the pressure of other matter.

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THE PRICE OF NORTH LONDON GAS.

ON the 7th instant a conference of representatives of the Corporation of London, the London County Council, and the Metropolitan Boroughs was held at the County Hall, Spring Gardens. The following resolutions were passed :—

"1. That in the opinion of this conference, the price charged by the Gas Light and Coke Company for gas supplied on the north side of the Thames is excessive, and constitutes a serious burden on the consumers of gas for domestic and manufacturing purposes.

2. That inasmuch as the management of the Gas Light and Coke Co. was condemned by the Select Committee of 1899, and the company have not complied with the recommendations of that Committee, and there is no immediate prospect, under existing conditions, of any substantial reduction in the price of gas, this conference considers that Parliament should be asked to forthwith intervene to protect the consumers from the present monopoly.

3. That inasmuch as three years have elapsed since the Select Committee of 1899 reported that the time had come when a reduction of the standard price might fairly be recommended, this conference earnestly requests the President of the Board of Trade to receive a deputation and to introduce a Bill into Parliament at the earliest possible moment to give effect to the recommendations of the Select Committee.

4. That in the event of the Government being unwilling to promote legislation for the redress of the consumers' grievance, this conference requests the London County Council and the Corporation of London to introduce a Bill into the next session of Parliament for the purpose of securing, either by revision of the present sliding scale arrangements or otherwise, a substantial reduction in the price of gas supplied by the Gas Light and Coke Co. north of the Thames.

5. That the advantages secured to the local authorities on the north side of the Thames by the City of London Gas Act of 1868 and the Amalgamation Scheme of 1883 as to the supply of gas for public purposes should not be interfered with."

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Clapham.—Twenty-seven houses with bay-windows on the south side of Deauville-road, Elms-road, Clapham, westward of Rodenhurst-road (Mr. W. E. Kerven).—Consent.

Dulwich.—A one-story shop on part of the forecourt of No. 68, Church-street, Camberwell (Messrs. F. Ward & Sons for Mrs. Clarke).—Consent.

Hackney, North.—A show case on the forecourt of No. 128, Albion-road, Stoke Newington (Messrs. A. F. Small & Co. for Mr. A. Joscelyn).—Refused.

Lewisham.†—A one-story addition at the flank of No. 1, Longton-grove, Sydenham, to abut upon Jew's-walk (Mr. J. H. Smith for Mr. G. Lister).—Refused.

Strand.—An iron and glass shelter at the entrance to the buffet and grill-rooms of the Grand Hotel, Charing Cross, to overhang the footway of the Strand (Mr. W. Woodward for the Gordon Hotels, Ltd.).—Refused.

Wandsworth (Detached).†— Additions in front of a factory building on the east side of Norwood-road, Herne-hill, southward of Croxted-road (Mr. C. M. Quilter for the Fisher Bookbinding Co., Ltd.).—Refused.

Woolwich.—A projecting lamp in front of the Director-General public-house, No. 27, Wellington-street, Woolwich (Mr. B. W. Adkin for Messrs. T. Norfolk & Sons and Mrs. A. M. Harper).—Refused.

Width of Way.

Kensington, North.—Rebuilding of a chapel on the western side of Bosworth-road, Kensington, with the external walls of the new building at less than the prescribed distance from the centre of the road-way of Stockton-mews (Mr. J. W. Chapman for the trustees of the Bosworth mission chapel).—Consent.

Space at Rear.

Holborn.—A modification of the provisions of Section 41 of the Act, so far as relates to the proposed erection of a building on the site of Nos. 79 and 80, High Holborn, with an irregular open space at the rear (Mr. L. W. Ridge for Mr. Owen Owen).—Consent.

Formation of Streets.

Hampstead.—Variation from the sections sanctioned on December 18, 1900, in connexion with the formation of a new street, to be named Glenloch-street, to lead from Haverstock-hill to Glenilla-street, Hampstead (Mr. C. J. Bentley for Mr. J. C. Hill and himself).—Refused.

Paddington, North.—That an order be issued to Messrs. Boehmer & Gibbs, refusing to sanction the widening and adaptation for carriage traffic of a footway known as Clarendon-passage, Maida Vale, and in connexion therewith the removal of the wall and steps at the eastern end of Clarendon-street and an alteration in the levels of Clarendon-street and Lanark-place (for Messrs. G. H. & A. Bywaters).—Agreed.

Brixton.—That an order be issued to Mr. W. Hunt refusing to sanction the formation or laying out of new streets for carriage traffic out of the east side of Clapham-road and north side of Landor-road, Lambeth (for Mr. W. P. Goosey).—Agreed.

Lines of Frontage and Space at Rear.

St. George, Hanover-square.—The rebuilding of No. 55, St. James's-street, Piccadilly, abutting upon Bennett-street, and, in the erection of the new building, certain deviations from the plan certified by the district surveyor (Messrs. Newman & Newman for the American Dental Institute.)—Consent.

Hammersmith.—A block of residential flats on the north side of Blythe-road, Hammersmith, with an irregular open space at rear and to abut upon Wharton-road (Mr. G. H. Fox for Mr. T. Pockington).—Refused.

Width of Way, Line of Frontage, Space at Rear, and Height of Buildings.

Paddington, North.†—Buildings with projecting porches, bay-windows, and balconies, on the site of Nos. 5 to 35 (odd numbers only, inclusive), Maida-vale, to an advanced line of frontage in Maida-vale, with the external walls of the buildings at less than the prescribed distance from the centre of the roadway of Lanark-place (Messrs. Boehmer & Gibbs for Messrs. G. H. & A. Bywaters).—Refused.

Width of Way and Construction of Building.

Stepney.—A wood and iron chapel building of a temporary character on the northern side of Sion-square, Mile End Old Town (Mr. M. Raphall).—Refused.

Dwelling-houses on Low-lying Land

Deptford.—That the solicitor do prepare a licence under Section 122 of the Act to Mr. H. A. Vohmann for the erection of twenty-seven cottages on low-lying land at Whitcher-street, Deptford, in accordance with the plan submitted with the application of Mr. S. Scholfield on his behalf.—Agreed.

*** *The recommendations marked † are contrary to the views of the local authorities.*

LONDON BUILDING ACT, 1894.

TRIBUNAL OF APPEAL CASE DISMISSED.

THE Tribunal of Appeal under the London Building Act, 1894, sat at the Surveyors' Institution, Westminster, on Tuesday, to hear an appeal by the Trustees of the Hearts of Oak Benefit Society against the certificate of the Superintending Architect of the London County Council, under Sections 22 and 29 of the Act, defining the general line of buildings on the north side of Euston-road, St. Pancras, between Church Way and Euston-square.

The members of the Tribunal sitting were Messrs. J. W. Penfold (chairman), A. A. Hudson, and E. A. Grüning.

The appellants were represented by Mr. MacMorran, K.C., and Mr. R. P. Mahaffy (instructed by Messrs. Capel Cure & Ball) and the respondent by Mr. Horace Avory and Mr. Daldy (instructed by Mr. Andrews from the Solicitor's Department of the London County Council).

The particulars of the appeal were stated to be as follows :—The Hearts of Oak Benefit Society are the owners in fee simple of the land on the north side of and adjoining the Euston-road upon which the houses numbered 152 to 170 (even numbers) inclusive are situate, and are also owners in fee simple of the adjoining land on the south side of, and adjoining, Grafton-place, upon which the houses Nos. 18 to 27 are situated. The land was acquired by the Society as a site to demolish and to clear in order to erect new offices. Accordingly application was made by Mr. M. C. Meaby, the Society's surveyor, to the London County Council for permission to erect the front main wall of their new offices on the same line as that on which the front main wall of the new Hospital for Women had been erected. To this the Council declined to consent, and Mr. Meaby thereupon applied to the Superintending Architect, under Section 22 of the London Building Act, 1894, to define the general line of buildings in that portion of Euston-road in which the Society's land was situated. On January 21 the Superintending Architect certified that the main fronts of the buildings as indicated in his plan formed the general line of buildings on the north side of Euston-road between Church Way and Euston-square. The appellants now submitted to the Tribunal that the general line of buildings so certified was in fact the existing frontage of the houses on the land acquired by the Society, and which would be pulled down and demolished by them. It was against this certificate of the Superintending Architect that the Society were now appealing.

The appellants pointed out that the distance of the front main wall of the buildings from the footway was greater than 50 ft. The width of the pavement opposite the building varied from 9 ft. 7 in. to 10 ft. 10 in., and the width of the roadway was about 38 ft. The front main wall of the hospital was about 24 ft. 6 in. from the footway in Euston-road. Moreover, to the east of the hospital and as far as the Midland Railway Co.'s goods sheds the front main walls of all the buildings on the north side of the Euston-road were flush with the footways. Opposite the land acquired by the Society is the Parish Church of St. Pancras, which, for the majority of its length, was about 77 ft. distant from the footway on the south side of the road. The grounds of the appeal were these :—That the Superintending Architect was wrong in not taking into consideration the general line of buildings in Euston-road to the east of the line which he certified when making his certificate, and that the general line of building on the north side of that portion of Euston-road in which the company's land was situated was not the line certified by the Superintending Architect.

Evidence was given by Mr. Meaby in support of the appeal, but the Tribunal came to the conclusion that the appellants had no case. Without calling on counsel for the respondent, they dismissed the appeal and allowed respondent forty guineas costs.

Correspondence.

QUANTITIES SUPPLIED *v.* QUANTITIES NOT SUPPLIED.

SIR,—Referring to the letter in your issue of the 1st inst., I think, from practical experience, Mr. Kinder got his client's houses built very cheap at 8d. per cubic foot, for in 1900 I had to prepare an estimate from the drawings and specification for a villa residence near London (I am assuming that the houses referred to on his estate are villas), also costing about 3,000*l.*, for one of the most respectable builders in London, valuing my own dimensions, *i.e.*, "builders' quantities;" and after the estimate was finished I cubed up the villa, as a check, and found it worked out at upwards of 9½d. per cubic foot—9½d. and some small allowance for carriage of materials, fifteen miles from London, and travelling expenses. We were the lowest, and within 1½ per cent. of the next competitor. I am quite sure my quantities were exact and valued at the lowest competition prices; and in the present unsettled state of the building trade I believe the work could not be done for less to leave a fair and reasonable profit.

All builders advocate for quantities to be supplied, and I can fully endorse all Mr. Kinder has said as to some quantities supplied, especially by country architects, being useless to tender upon, and increasing the cost of a building; as an instance, the roof being billed at per square "including slating, felt, boarding, fir, and the necessary straps and bolts"; the stone front at per foot superficial, "and form your own allowance for projection of mouldings, bonders, and depth on beds"; forgetting that the only way to measure stonework, to be of any use in estimating, is as the stone "goes to the banker," and bill the number of ft. cube; painting to doors per yard superficial measured over the architrave, no dimensions being given of the girth of the architrave, or the panel mouldings of the doors. He certainly stated "four coats," but these doors had to be painted four times, flatted, and the mouldings cut in a different tint; the architrave should have been billed at per lineal foot stating the girth, or at least as small surfaces, and the panel mouldings also at per lineal foot.

WILLIAM H. PIPE.

EXTENSION OF ABERDEEN PUBLIC LIBRARY.—A meeting of the Buildings Sub-committee of the Public Library Committee was held in the Public Library, Aberdeen, on the 7th inst. Plans were submitted in reference to the proposed new central reading-room, and the architects (Messrs. Brown & Watt) were instructed to amend the plans somewhat. With regard to the Torry branch reading-room, Messrs. Brown & Watt were selected to prepare sketch plans of a building on the site recently purchased at the corner of Victoria-road and Grampian-road.

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BOOKS RECEIVED.

THE ABBEY OF ST. MARY, IN FURNESS, LANCASHIRE. By W. H. St. John Hope, M.A. (T. Wilson, Kendal.)

THE CATHEDRAL CHURCH OF AMIENS. By the Rev. Thomas Perkins. (Geo. Bell & Sons.)

THE ABBEY AND CHURCH OF WESTMINSTER. By Charles Hiatt. (Geo. Bell & Sons.)

CHICHESTER: THE CATHEDRAL AND SEE. By Hubert C. Corlette. (Geo. Bell & Sons.)

THE MUNICIPAL YEAR-BOOK OF THE UNITED KINGDOM. 1902. Edited by Robert Donald. (Edward Lloyd.)

ENGINEERING CHEMISTRY. By H. Joshua Phillips, F.I.C., F.C.S., A.Inst.C E. Third Edition. (Crosby Lockwood & Co.)

THE MODERN TREATMENT OF SEWAGE. By H. C. H. Shenton, M.S.E. (S. Edgecumbe-Rogers.)

OBITUARY.

MR. BRYAN DONKIN, C.E.—Early on the morning of March 4, Mr. Bryan Donkin died very suddenly in Brussels from heart disease, at the age of sixty-six. The name he bore has been intimately associated with the advancement of mechanical science for a century or more, although not so well known to the general public as those of other pioneers in the same field. The works in Bermondsey with which Mr. Donkin was associated for more than forty years, were originally established by his grandfather in the year 1803, being then chiefly devoted to the production of paper-making machinery, and since to various useful types of engineering plant. Mr. Donkin was educated at University College, London, and at the Ecole Centrals des Arts et Métiers, Paris, afterwards serving an apprenticeship at the Bermondsey works, which he joined as a partner in the year 1868. In 1873 he was elected a member of the Institution of Mechanical Engineers, and at the time of his death was a Vice-President of that body. In 1884 he was elected a Member of the Institution of Civil Engineers, by whom he was awarded the Watt Medal, the Telford Premium, and the Manby Premium. He was also a Member of the American Society of Mechanical Engineers, of the Société d'Encouragement, Paris, and of the Verein Deutsche Ingenieure, Berlin. Although engaged for many years in the active conduct of affairs at the works of his firm, the natural inclination of Mr. Donkin was clearly towards the field of scientific research, and when occupied in the manufacture of steam engines, he conducted various investigations which have been of the utmost value to the nation, a fact little known by the people who have been the most benefited. For some years past Mr. Donkin had more opportunity of devoting himself to experimental and literary work. The numerous papers contributed to the Institutions of Civil and Mechanical Engineers testify to years of patient research, and some of his most noted investigations were those undertaken in conjunction with Professor Kennedy, and relating to the efficiency of steam boilers. Mr. Donkin's works on "Heat Efficiency of Steam Boilers" and "Gas, Oil, and Air Engines," bespeak an immense amount of hard work, and are recognised as most valuable text books on those subjects. Mr. Bryan Donkin was a familiar figure at the meetings of the two leading Engineering Institutions in London, and his loss will be regretted by a large circle of professional as well as other friends.

GENERAL BUILDING NEWS.

PRESBYTERIAN BUILDINGS, GATESHEAD.—The foundation-stone of a hall and classrooms in Brighton-avenue, Gateshead, for the Presbyterian cause has just been laid. The scheme comprises a church to seat about 700, with hall to seat 500, classroom accommodation and caretaker's house. Messrs. Badenoch & Bruce, Newcastle, are the architects for the work, and the contractor for the hall and classrooms is Mr. John Anderson, Newcastle. The church will stand at the corner of Brighton-avenue and Whitehall-road, and the hall is placed behind to the north, fronting on Whitehall-road and Ridley-street. The walls will be in stone, with hammer-dressed facing and chiselled dressings. The total cost of the completed scheme, including site, is estimated at 8,000*l*. The present contract, which includes hall, caretaker's house and classrooms, will cost about 2,800*l*. exclusive of site.

CHURCH, MILNGAVIE, STIRLINGSHIRE.—The memorial stone of Cairns New U. F. Church, Milngavie, has just been laid. The new church is designed by Colonel J. B. Wilson, Glasgow, and will accommodate 650 members. The contractors are Messrs. J. H. White & Sons, Glasgow; joiners, Messrs. Wm. Guthrie & Co., Glasgow; slaters, Messrs. Hamilton & Co., Glasgow; plasterer, Mr. George Borland, Milngavie; plumber, Mr. Renfrew, Glasgow; mason for manse, Mr. Currie; and joiners for manse, Messrs. A. & D. M'Millan, Milngavie.

STEVENSON MEMORIAL CHURCH, GLASGOW.—The new Stevenson Memorial U.F. Church, Glasgow, has just been opened. It is situated on the boundary between Kelvinside and Maryhill districts, at Belmont Bridge, Belmont-street, running off Great Western-road, just past Kelvin Bridge. The architect is Mr. John J. Stevenson, London, whose design was illustrated and described in the *Builder* for May 28, 1898.

METHODIST FREE CHURCH, EASTVILLE, BRISTOL.—A new Methodist chapel has been erected at Eastville, opposite the first entrance to the Park. The church is designed to seat 800 persons, and, with extensions to the school at the back, the total cost is estimated at 4,000*l*. The building is of Gothic style, and has a gallery running round three sides. The accommodation for the choir is behind the rostrum. The seats and internal roofing are of pitch-pine. Mr. E. Clarke, builder, of Fishponds, has carried out the contract in accordance with the plans of Mr. H. M. Bennett.

NEW BUILDINGS IN ABERDEEN.—The Plans Committee of the Town Council has sanctioned the following plans of new buildings:—Shed on the south-east side of Baltic-street, for Messrs. D. Macdonald & Sons, commission merchants, per Mr. R. G. Wilson, architect. Shed on the south side of Whitehall-place, for Mr. Edgar Gauld, builder, per Mr. W. E. Gauld, architect. Shed and polishing mill on the west side of the road leading from Merkland-road East southwards to the Corporation gasholder, for Messrs. Gibb Brothers, granite merchants, per Mr. William Smith, architect. Alterations in connexion with premises, Nos. 61 and 63, St. Nicholas-street, for Messrs. Alexander Badenoch & Son, clothiers, per Mr. W. E. Gauld, architect. Alterations in connexion with premises, Nos. 171-173, Union-street, for Messrs. Edmonds & Ledingham, advocates, per Mr. R. G. Wilson, architect. Dwelling-house on the north-west side of Braemar-place, for Mr. James Farquhar, builder, per Messrs. Brown & Watt, architects. Alterations in connexion with premises, Nos. 7 and 9, Justice-street, for Messrs. Cochran & Macpherson, advocates, per Mr. R. G. Wilson, architect. Dwelling-house on the north side of Rubislaw Den North, for Mr. Thomas Ogilvie, jun., warehouseman, per Messrs. W. & J. Smith & Kelly, architects. Dwelling-house on the north side of Victoria-road, for Messrs. George & James Knowles, fishermen, per Messrs. Cameron & Watt, architects. Alterations at 3, Sinclair-road, for Mr. John Henderson, King-street, per Mr. Duncan Hodge, architect. Addition to fish-curing premises at North Esplanade for the Scottish Co-operative Wholesale Society, Ltd., per Mr. J. Davidson, architect, Glasgow. Alterations and additions in connexion with the fish-curing premises at Old Ford-road, for Messrs. Moir, Wilson, & Co., per Messrs Brown & Watt.

THE BRADFORD BATHS SCHEME.—A special meeting of the Baths and Team Labour Committee ot the Bradford Corporation was held on the 3rd inst. to consider the plans and specifications for the proposed central baths in Morley-street and the district bath in Drummond-road. Mr. A. Hessell Tiltman, of London, the architect, was present. A memorial was received by the Committee, signed by a number of persons who use Turkish baths at the Thornton-road establishment, complaining of the inadequate accommodation provided for such baths at that place. The city Architect (Mr. F. E. P. Edwards) reported, as he had been requested to do, upon the condition of the Thornton-road baths, and stated that the repairs required at the existing central baths cannot be executed at a less cost than 2,000*l*. or 3,000*l*.

BRITANNIA NAVAL COLLEGE, DARTMOUTH.—The foundation-stone of this building was laid last week by his Majesty the King. The architect of the building, which was illustrated and described in our issue for April 20, 1899, is Mr. Aston Webb, A.R.A. A view of the sick quarters and a brief description appeared in our issue for May 4, 1901.

INFIRMARY, WIGAN.—The new isolation wards recently added to the Royal Albert Edward Infirmary, Wigan, were opened recently. The new building forms a small separate hospital situated on the slope of the hill to the north-west of the old "Woods'" ward, and accessible from the grounds by a broad drive, terraced up to the entrance door on the west side. The entrance hall gives access to the two ante-rooms which open into the male and female wards on either side. Each of these is 24 ft. by 22 ft., with a circular ceiling, forming a lofty room, well lighted on each wall, and providing space for four beds. The duty-room for the nurses is placed between the two wards with a window looking into each, and doors into the separate ante-rooms. At the other end of the wards the sanitary accommodation (baths, lavatories, &c.) is arranged, the rooms being entered from a short corridor stretching across the building with a window at each end, separating them from the wards and preventing the risk of infection. From the entrance hall on the opposite side to the ante-room access is obtained to the ward kitchen and stores, passing the foot of the staircase to the upper floor, which extends above the hall and nurses' room, and contains bedrooms for the nurses and servants, with bath, lavatory, &c. In the basement story, which is reached from an outside entrance on the lower drive below the terrace, are placed the boiler and heating apparatus, warming the building and supplying steam and hot water. The building is constructed of brick and stonework, harmonising in appearance with the older buildings, and having slated roofs, crowned with turrets in which are fixed the ventilating cowls from the wards. Internally, with the exception of the sanitary annexes, which are lined with glazed brickwork, the walls and ceilings are finished in cement, and with the woodwork enamelled ivory white. Messrs. Thomas Worthington & Son, Manchester, were the architects, and the work has been carried out by Mr. C. B. Holmes, of Wigan, under their supervision. Messrs. Newton, Chambers, & Co., Manchester, were the hot water engineers.

BANK, ABERDEEN.—A new harbour branch of Aberdeen Town and County Bank is to be erected on the site of the present branch and of the two adjoining houses at the foot of Marischal-street. The elevation to Marischal-street is 83 ft. in length, and to Regent Quay 26 ft., the site being wedge-shaped, as Shore-lane runs at an angle at the back of the premises. The ground floor will be occupied by the bank, having a public office of about 40 ft. by 21 ft., with agents' room and waiting-room, &c. A firm of shipowners will occupy a suite of offices on the first floor, while on the upper floor there will be another suite of offices. The elevations, which are Renaissance in style, and will be built of granite, consist of a rusticated base, on which stands a row of pilasters, extending two stories in height, with Ionic capitals, and being carried up to the entablature at the Regent Quay front, where will be the principal entrance to the bank. The Marischal-street front will be crowned by a balustrade, divided into sections by moulded panels. As Shore-lane is at the rear of the building, it will be lighted from three sides. Electric light will be installed. The architect is Mr. R. G. Wilson, and the contractors are:—Mason work, Mr. J. Morgan; carpenter, Mr. J. Henderson; slater, Mr. George Farquhar; plumber, Messrs. Thom & Strachan; plaster work, Messrs. James Bannochie & Sons; and painter work, Messrs. Gordon & Watt.

CO-OPERATIVE BUILDINGS, CHIRTON, NORTH SHIELDS.—The new branch premises of the North Shields Industrial Society, Ltd., just erected at Chirton village, were opened on the 1st inst. The premises, which are situated on the main thoroughfare from North Shields to Percy Main and the Newcastle turnpike, comprise a block of buildings, in which are several departments for provisions, bread and confectionery, drapery, boots and shoes, &c. A new steam bakery is a part of the new premises. The premises have been erected by Mr. Fishburn, contractor, from the designs of Messrs. Hope & Maxwell, architects, with Mr. Joseph Warwick as clerk of works. The machinery in the bakery was installed under the superintendence of Mr. Owen, M.I.M.E., representing the engineers, Messrs. Werner, Pfaiderer, & Perkins.

Y.W.C.A. BUILDINGS, HEREFORD.—The foundation stones of the new hall of the Young Women's Christian Association were laid at Hereford recently. The new structure, which will be of two stories, will be built by Mr. William Powell, Hereford, of Hampton Park bricks and terra-cotta dressings in the Renaissance style, from plans prepared by Mr. W. W. Robinson, architect, Hereford. The assembly-room itself, which will be open to the roof will measure 50 ft. by 22 ft., and will be heated by two Shoreland grates, though provision has been made for hot-water apparatus should at any time this be desired. It will have a wide entrance porch. On the ground floor there will also be a classroom and two ante-rooms, one at the entrance and the other at the platform end of the hall, through which latter there will be a separate entrance for speakers. On the first floor will be a room, 21 ft. by 14 ft.

CO-OPERATIVE PREMISES, SMALL HEATH, BIRMINGHAM.—New buildings in Coventry-road, Small Heath, have been erected for the Birmingham Co-operative Society. The building is three stories in height, and has cost, with fittings, some 12,000*l*. There are four shops, a showroom on the first floor, and an assembly-room on the top floor. The last-named it is proposed to utilise for entertainments to members of the society, lectures to disseminate the principles of co-operation, and to let out for other purposes. The room will seat 700 people. The whole establishment is lighted by electricity, generated on the premises. The architect is Mr. F. E. L. Harris, Manchester, and the contractor is Mr. T. Rowbotham, Birmingham.

LIBRARY AND POLICE STATION, CHAPELTOWN, LEEDS.—A new branch library and police station are to be erected at the corner of Chapeltown-road and Town-street, Chapeltown, at a cost of about 8,000*l*. The two buildings, though separated internally, will adjoin each other, and will have a frontage of 103 ft. to Chapeltown-road and to Town-street. The library building will include a lending library and reading-room, with a gallery on the first floor; and a ladies' room will be provided. The police station will include superintendent's house and fire-brigade station. The buildings, which have been designed by Mr. William H. Thorp, of Leeds, will be of stone.

SANITARY AND ENGINEERING NEWS.

A NEW BRIDGE OVER THE TYNE.—The North-Eastern Railway Company have given the contract for the building of a new high-level bridge over the River Tyne at Newcastle to the Cleveland Bridge and Engineering Co., Ltd., of Darlington. In point of size and cost this will be the largest bridge contract which has been given in the United Kingdom since the completion of the Forth Bridge.

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The estimate of the engineer (Mr. Charles A. Harrison) of the cost was 470,000*l.*, but the contract is for rather less than that sum. The contract comprises a railway of four lines of road, beginning at a junction with the Newcastle and Carlisle Railway west of Newcastle and terminating by a junction on the main line east of the new bridge on the Gateshead side, being a length of over half a mile of viaduct. Besides, there is included a connecting loop railway of two lines of road, beginning at a junction with the railway at the south end of the bridge and joining the main line again to the west of Gateshead Station, this second railway forming a viaduct about 800 ft. in length.

NEW SEWAGE WORKS, LINLITHGOW.—The Local Authority having decided to introduce a new system of drainage for the town, the contractors—Messrs. Blair & White, Glasgow—have commenced the construction of the sewage disposal works. These will be situated a short distance from the burgh, and will occupy an area of between three and four acres. The system selected is the bacteriological or septic tank process of filtration. The works are expected to cost about 10,000*l.*

FOREIGN.

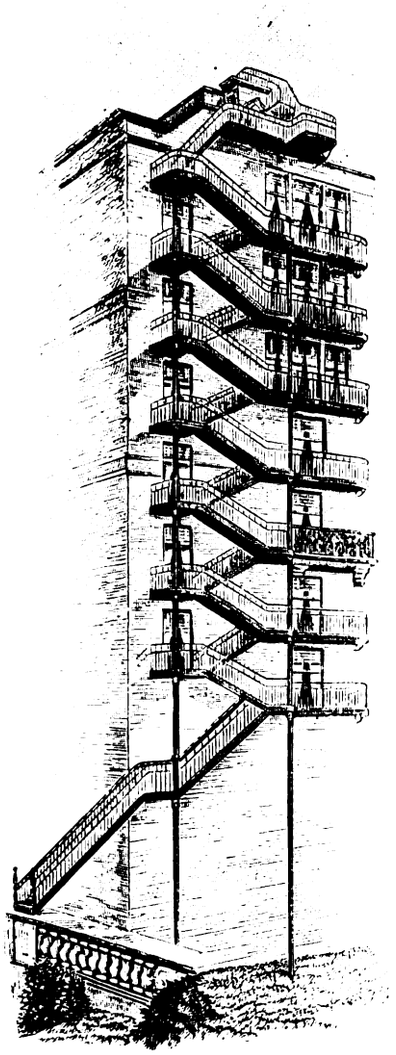
FRANCE.—M. Bouvard, the architect, has proposed a street improvement scheme for Paris which will obviate any necessity for the proposed bridge over the Seine adjoining the Pont Neuf and facilitate the traffic of the Rue de Rennes, which will be prolonged in the direction of the Rue du Louvre, with a bifurcation into two roads, one leading to the Pont des Saints-Pères and the other to the Pont Neuf. In this manner the Institut building will be opened up and will have a larger open space round it. New façades will be erected on the Rue de Seine (enlarged) and on the prolongation of the Rue de Rennes, but those on the Quay will remain as they are. It must be added that the Metropolitan Railway, which will pass under the river at this point, will materially reduce the traffic in the street and over the two bridges.——The municipality of Marseilles has voted the expenditure of a sum of 4,000,000 francs for the erection of thirty-nine new schools and the formation of a technical training school.——The differences between the State and the Société des Artistes Français have been at last smoothed over, and the Salon will open on May 1 as usual.——An exhibition of Industrial Art and Furniture is announced to be held in the Grand Palais this summer.——The jury of painting for the Salon remains the same as last year, all having been re-elected, M. Bouguereau at the head of the list with 1,010 votes.——M. de Morgan is arranging, at the Grand Palais des Arts, an exhibition of the antiquities discovered by him in Susa and Chaldæa.——The Conseil-Général of the Seine has opened a competition for the artistic decoration of the Mairie of Vanves.——Work has been commenced for the enlargement of the railway station at Amiens, one of the most important stations on the Nord railway line, but at present quite inadequate for the traffic.——At Toulouse a committee is to be formed analogous to that of "Vieux Paris" in the capital, in order to watch over the preservation of the antiquities of the town.——The French Government has voted a sum of over 20 million francs for the completion of a railway in the Soudan, as well as a sum of 100 millions for various public works in Algeria.——The death is announced, at Paris, of M. Albert Bitner, architect, and member of the Société Centrale, at the age of fifty-six.——M. Aizelin, the sculptor, has died at the age of eighty-one. He was a pupil of Ramey and of Dumont, and made his first appearance in the Salon of 1852, with a statue of Sappho. His principal works are the "Psyche" at the Luxembourg, the "Enfant au Sablier" in the Nantes Museum; and the "Orphée" in the Museum of Rheims. He executed a great number of busts, and took part in various public monuments in Paris and the Departments; among others the figure of "Japan" for the 1878 Exhibition; that of "Comedy" for the theatre of Monte Carlo; the statues of Bailly and Mme. de Sevigné for the Hôtel de Ville of Paris, and statues for the churches of St. Eustache and La Trinité.——We have to record also the death of M. Paul Flandrin, the painter, brother of Hippolyte Flandrin, at the advanced age of ninety-one. He was a pupil of Ingres, and after commencing as a historical painter, subsequently devoted himself to landscape. He executed, among other work, the mural decoration of the Château de Dampierre, and the paintings in the Church of St. Severin.

MISCELLANEOUS.

SHEFFIELD BUILDERS AND THE CITY COUNCIL.—The monthly meeting of the City Council of Sheffield was held on the 6th inst. Representatives were present from all the branches of the building trades. The strength of the Federation has now assumed such large proportions that the Council are now considering the desirability of nominating and supporting a candidate from the body for a seat on the City Council, in order that the building industry, which engages so much of the skilled labour belonging to the city, shall have its questions voiced by one of its own members. This question was taken up very heartily, and will soon be the most paramount question of the various societies forming the above Federation.—*Sheffield Telegraph.*

THE REMOVAL OF GLASGOW EXHIBITION BUILDINGS.—The Parks Committee of Glasgow Corporation, at a recent meeting, had before them a minute of a meeting of the Sub-Committee on Galleries and Museums. At that meeting the subcommittee on retention of the Glasgow International Exhibition Buildings and the restoration of the portion of the Kelvingrove Park used in connexion with the Exhibition, reported that they had a meeting on the 24th ult. with Mr. Hedley, manager of the Exhibition Association, and Mr. James Laird, auctioneer, when, having heard Mr. Hedley regarding the present position of the Exhibition contractors' accounts, they had remitted to Mr. Hedley and Mr. Laird to arrange for the Corporation, per the latter, now getting possession of the Exhibition buildings and grounds at once; and had authorised Mr. Laird's firm to commence at once the demolition of the grand avenue and bridge and Miss Cranston's tea-rooms, and thereafter proceed with the sale of the materials; and authorised Mr. Laird's firm to commence immediately on the expiry of three weeks from date the demolition of the whole of the other Exhibition buildings and the sale of the materials.

FIRE ESCAPE STAIRCASE, HYDE PARK COURT.—The illustration shows a fire-escape staircase erected by the St. Pancras Ironwork Company at the block of mansions known as Hyde Park Court. In 1900 the company erected two such staircases on



Fire Escape Staircase, Hyde Park Court.

the south side of the block, and in the autumn of last year they received an order for two more staircases on the north or park side of the building. These have been already finished, a month earlier than the contract time. Each staircase is in sixteen flights and over 100 ft. high.

METROPOLITAN IMPROVEMENTS, SOUTH LONDON.—The southern approach to the Tower Bridge, which was opened on Saturday last, was originally projected by the late Metropolitan Board of Works as a thoroughfare from the junction of the Old Kent and New Kent roads through Bermondsey to Tooley-street. After the completion of the Tower Bridge, the London County Council widened to 60 ft. Bermondsey New-road northwards, from the end of Old Kent-road to what was known as Star Corner, and Grange-road, whence they have constructed a new road, having the same width, to Abbey-street, at the corner of the churchyard—now a recreation ground—of St. Mary Magdalene parish church, and so across Tanner-street via Church-street and underneath the railway to St. John's Church at the corner of Artillery-street and Horseleydown. The thoroughfare is nearly three-quarters of a mile in length, and the cost of the works amounts to, it is stated, about 400,000*l.*—The Bermondsey Borough Council in taking over a scheme of the late Rotherhithe Vestry, resolved at their meeting on March 4, to offer premiums of 100*l.*, 60*l.*, and 40*l.* respectively, for the best three plans for the erection, at an estimated cost of 51,000*l.*, of working-class dwellings on the Fulford and Braddon streets area, situated between Paradise-street and the Pool at Rotherhithe. The Vestry's original plans, now relinquished, comprised four blocks of dwellings, to be rented at about 3s. 5d. per room per week.

THE CITY SURVEYOR, CHICHESTER.—Mr. James Saunders, A.R.I.B.A., has resigned the appointment of City Surveyor and Waterworks Engineer at Chichester, with the intention of entering on private practice as a civil engineer and architect at Newark and in Nottingham. The post of City Surveyor of Chichester therefore becomes vacant.

RUSSELL-STREET, DRURY-LANE.—A large block of buildings between Crown-court and the crossing of Drury-lane has lately been demolished, the clearance extending northwards as far as the south boundary of the children's playground, formerly a burial-ground appertaining to the parish of St. Martin-in-the-Fields and laid out in 1877 by the Metropolitan Public Gardens Association. At the corner of Russell-street and Drury-lane stood the old Albion tavern, which until recent years had formed a favourite resort of members of the dramatic profession in the days when the building of theatres had not advanced westwards to the locality near Leicester-square.

WIDENING OF PICCADILLY.—In the House of Commons on the 6th inst. Mr. Lough asked the First Commissioner of Works whether his attention had been called to a report recently made to the London County Council by its Improvements Committee, detailing the negotiations which had taken place between the Council and his Majesty's Commissioners of Woods and Forests, with a view to secure upon the expiration of the leases and at a fair valuation the strip of freehold land required for the setting back of the buildings on the northern side of Piccadilly, so as to widen to 80 ft. the portion of the thoroughfare between the Circus and Sackville-street; and whether he could see his way to assist the object in view. Mr. Akers-Douglas: I have seen the report referred to by the hon. member. No doubt the setting back of the buildings on this site would afford a great improvement to the traffic in this crowded thoroughfare; and I should like to see such an improvement carried out. The matter, however, is one which does not come under my department, and any question on this subject should be addressed to the Treasury.

PLUMBERS' EXAMINATION AT KING'S COLLEGE.—Thirty master and operative plumbers applying for registration under the National Registration of Plumbers attended at King's College on the 8th inst. for examination by the Worshipful Company of Plumbers. The candidates were from various parts of London, and also from Dover, Eastbourne, Hailsham (Sussex), Ramsgate, Redhill, St. Albans, St. Leonards-on-Sea, and Sutton (Surrey). The practical test included lead bossing and the making of plumbers' joints, &c. The examination questions included the subjects of contamination of drinking water from faulty connexions, roof covering, arrangement of bath, sink and closet wastes, drainage of town houses, and disconnection with sewers. The examiners were: Mr. Charles Hudson, master plumber, Chairman of the Board of Examiners; Mr. J. Knight, master plumber; and Messrs. J. T. Martin and G. W. Stacey, representing the United Operative Plumbers' Association of Great Britain and Ireland. Sixty per cent. of the masters and forty per cent. of the operatives succeeded in passing the examination.

INSTITUTE OF SANITARY ENGINEERS.—We draw attention to the fact (as stated in our advertising columns) that the dates of the examination in Practical Sanitary Science are altered from March 28 and 29, as originally advertised, to April 4 and 5.

INSTITUTE OF CERTIFIED CARPENTERS.—On Saturday afternoon, March 8, the members of the British Institute of Certified Carpenters visited the works of Messrs. F. W. Reynolds & Co., Edward-street, Blackfriars. Much interest was taken in the woodworking machinery, which was seen in operation, especially in the planing, moulding, tenoning, and mortising machinery, of which the firm have a large variety. At the close of the afternoon a vote of thanks to the firm for having kept their works open was moved by Mr. Ellis and seconded by the secretary, Mr. W. E. Cutter. Mr. F. W. Reynolds, in responding, said that it had been a pleasure to show the machinery to such an intelligent, critical, and appreciative gathering. He pointed out that if British manufacturing trades were to maintain their

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supremacy, the British workman must do his best in the work in which he was engaged, and that he, as a manufacturer of woodworking machinery, was desirous of bringing out such machinery as would at all times be able to cope with the competition of foreign countries.

BEVERLEY MINSTER.—A very large clock with chimes has just been erected in the minster towers. The chimes play upon ten bells in the north-west tower, and the hours are struck upon a new bell (Great John), which weighs seven tons, in the south-west tower. The whole of the work has been carried out by Messrs. John Smith & Sons, of Derby, generally to the designs of Lord Grimthorpe.

WATER-COLOURS BY MR. ERNEST GEORGE.—Messrs. Frost & Reid have on view at their gallery at 8, Clare-street, Bristol, a small collection of water-colour drawings of architectural subjects by Mr. Ernest George, including subjects from Venice, Bologna, Dieppe, Louvain, and other Continental towns.

ABBEY DORE CHURCH.—A new stained-glass memorial window has recently been fixed in one of the large lancets in the clearstory on the south side of the presbytery at Abbey Dore Church. It is largely heraldic, and the centre is chiefly occupied by an elaborate shield of twenty quarterings—the arms of the donor—surmounted by helmet, crest, and mantlings. In the apex of the window are initials and monograms, and in the lower part a memorial inscription, the whole design being enclosed in a plain border. The window has been executed by Messrs. James Powell & Son, of Whitefriars, from the design and details supplied by the architect, Mr. Roland W. Paul.

LEGAL.

ACTION BY A BUILDER FOR RESCISSION OF CONTRACT.

THE case of Gibbs *v.* Towle came before Mr. Justice Farwell in the Chancery Division on the 5th and 6th insts.—an action by the plaintiff, a builder, the purchaser of a small property situated at Stapleford, in the county of Nottingham, against the defendant, the vendor, the plaintiff alleging that he was induced to enter into the contract by misrepresentations made by the defendant as to the area of the land in question.

The plaintiff asked for rescission of the contract, or in the alternative, if specific performance was granted, that there might, in consequence of the misrepresentation, be an abatement of the purchase price. No fraud was alleged.

Mr. Upjohn, K.C., and the Hon. Frank Russell appeared for the plaintiff; and Mr. C. E. Jenkins, K.C., and Mr. G. Lawrence for the defendant.

Mr. Upjohn, in opening the case, said that in March, 1901, Mr. Towle was endeavouring to sell a piece of land near Stapleford and advertised it. The plaintiff saw the advertisement, and the result was that the parties went together on March 18 to a place called Trowell. The plaintiff saw the land there, but entertained no idea of buying it On walking back to Stapleford together a conversation took place about the land the defendant had there. On the same day the plaintiff saw the piece of land at Stapleford. The defendant represented that it was about 1,000 square yards and asked 30s. per square yard for it. He ultimately agreed to take the sum of 1,250*l.* for the land, that being at the rate of 25s. per square yard. An agreement was drawn up and executed on March 18, 1901, the agreement being to the effect that the defendant would accept 1,250*l.* for the land on the condition that the defendant should be allowed to pull down the old buildings on the site and keep the materials for himself. The purchase was to be completed by June 24 following. In April the defendant called upon the plaintiff at his place of business in Loughborough and asked him for a further instalment on the purchase price of the land. As a result of the interview the plaintiff agreed to give the defendant an additional 250*l.* on the purchase price agreed upon if the defendant would agree to give up his claim to the materials of the old houses on the site. It appeared that the plaintiff did not want to build quite as soon as he intended, and as the buildings were let and producing a rental he was anxious that that state of things should remain. In the following August the plaintiff's solicitor asked for an abstract of title, and on September 7 a complete abstract was sent. Then the question was raised as to the area of the land, and the plaintiff's solicitor instructed a surveyor to make a plan of the property. This was done, and the plan showed that the area of the land was only 690 sq. yds. That fact was communicated to the plaintiff, and then he raised the point that the land was not in accordance with the representation that the defendant originally made.

Evidence having been given in support of the plaintiff's case,

For the defence the defendant said he was formerly in the lace trade at Nottingham, but retired some time ago. He had since been engaged in building operations. On March 18 last year the plaintiff and his brother came to him about some land that he had for sale, and which he had advertised; but nothing came of this. When walking down the road he told the plaintiff and his brother about the land in question, and they visited it, he pointing out what he had conceded to the County Council for footpaths. He told them that the site originally included some 1,200 yards. He asked 1,500*l.* for the land. There was no mention of a price per yard, and he never said he must have 30s. per yard for it. Plaintiff said that 1,500*l.* was too much, and eventually plaintiff agreed to give 1,250*l.*, and he sold it for that price. It was not till the following October that he heard there was any dissatisfaction about the area of the land. The plaintiff asked as to the area of the land, but witness told him that he did not know how many yards there were in the area. He refused to make any abatement in the price when plaintiff told him about the area.

The defendant's wife having given evidence in support of the defendant's case, and Mr. Jenkins having addressed the court on behalf of the defendant, his Lordship, in giving judgment, said he did not impute intentional misrepresentation or want of bona fides against the defendant. He could not, however, accept the defendant's statement. His Lordship accordingly made a decree rescinding the contract, and ordered the defendant to repay to the plaintiff the deposits paid by the plaintiff, viz., 350*l.*, with a declaration that the plaintiff was entitled to a lien for the amount, together with profit, interest, and costs.

Mr. Upjohn said he was willing to accept a payment of 350*l.* without interest if paid within a month; if not paid within a month with 4 per cent. interest.

Judgment accordingly.

THE NEW STREET FROM HOLBORN TO THE STRAND.

THE case of the London County Council *v.* the Metropolitan Electric Supply Co., Ltd., came before the House of Lords, composed of the Lord Chancellor, and Lords Macnaghten, Shand, Davey, Brampton, Robertson, and Lindley, on the 10th instant, on the appeal of the plaintiffs from the judgment of the Court of Appeal, composed of Lords Justices Collins (now the Master of the Rolls) and Stirling, reversing an order of Mr. Justice Farwell in the Chancery Division. The case was reported in the *Builder* of May 4 and 18, 1901. The case raised a question of interpretation of a section of the London County Council (Improvement) Act, 1890. When the Act was passed the defendant company had a generating station and works for the purpose of electric lighting in Sardinia-street, the whole of which was required to be taken by the County Council for the purposes of the new street from Holborn to the Strand. A statutory bargain was arrived at between the parties, which was embodied in Section 58 of the Improvement Act. The dispute arose under Sub-section 7, which provided in effect that the Council, before the date of conveyance and lease of the new site (which the Council had to provide for the Company), should pay or secure to the satisfaction of the Company a sum equal to the costs of erecting and fitting up a new generating station upon the new site, with new plant of a capacity to generate and supply electrical energy to an output of not less than 4,000 kilowatts. The plaintiffs contended that this meant that they were only bound to provide a sum equal to the costs and expenses of erecting and fitting up a new generating station with new plant of a capacity to generate and supply electrical energy to an output of not less than 4,000 kilowatts, and that they were not bound to bear the expense of a new plant of a capacity to generate and supply electrical energy to an output of 5,000 kilowatts, or any number more than 4,000 kilowatts, on the ground that, under unusual circumstances, a more powerful plant might be required to generate and supply 4,000 kilowatts. The defendants, on the other hand, contended that the sum claimed by them was based on the station and plant being of a capacity to generate and supply such output as a matter of practical commercial working, and that it was impossible for them to generate and supply an output of not less than a fixed amount without having, in addition to the minimum plant capable of generating or supplying such an amount, temporarily spare or extra plant in case of a breakdown or repairs. Mr. Justice Farwell held that the plaintiffs were right in their contention, and granted a declaration to that effect. On the defendants' appeal, however, to the Court of Appeal Lord Justice Collins, in giving judgment, said it was obvious that, in order to ascertain what sum was to be paid by the County Council, it was necessary to have a decision by competent persons on questions of fact. It was substantially agreed that the matter must go to an arbitrator as to some part of the matters in dispute, and it had been thought desirable to anticipate the arbitration by taking the opinion of the Court as to the construction of a point of law arising upon the section in question. The short point of law which the Court had to decide was whether, as a matter of law, the arbitrator was to be debarred from allowing, and therefore calling upon, the plaintiffs to pay for anything more than for such engines which could fairly be graded up to 4,000 kilowatts. The conclusion he came to was that on the section in question the proper direction would be that the sum to be paid would be for such plant as would be required to generate for a reasonable period under all conditions such as might reasonably be anticipated an energy of not less than 4,000 kilowatts. It would be for experts to determine the number of engines and their capacity sufficient to generate the requisite supply imposed on the defendants. If the experts said that four such engines were not competent in an ordinary commercial sense to carry out the obligation imposed on the defendants of continually supplying an output of 4,000 kilowatts, then the County Council must find the money and pay for anything more that was required. Lord Justice Stirling concurred, and the appeal was accordingly allowed. Hence the present appeal of the plaintiffs.

Mr. Haldane, K.C., M. C. E. Jenkins, K.C., and Mr. Methold, appeared as counsel for the appellants (plaintiffs), and Mr. Cripps, K.C., and Mr. Sargant for the respondents (the defendants).

At the conclusion of the arguments of counsel, their Lordships unanimously held that on the construction of the Act the limit of 4,000 kilowatts was intended to be the measure of the County Council's liability.

The appeal was accordingly allowed, the judgment of the Court of Appeal being set aside, and the order of Mr. Justice Farwell restored.

ACTION FOR PROFESSIONAL FEES.

THE case of Dolby & Williamson *v.* Lord Wenlock came before Mr. Justice Wright, sitting without a jury, in the King's Bench Division on the 11th inst.

Mr. McCall, K.C., and Mr. B. A. Cohen appeared as counsel for the plaintiffs; and Mr. Lawson Walton, K.C., and Mr. Bairstow for the defendant.

In this case it appeared that the plaintiffs, who are electrical engineers, claimed from the defendant 318*l.* for professional fees in connexion with the installation of electric light at Lord Wenlock's seat, Escrick Park, York. The defendant had paid 150*l.* into court, with a denial of liability. The case turned on the correspondence between Mr. Walker, Lord Wenlock's agent, and the plaintiffs as to the amount for which the work in question was to be done. Mr. Lawson Walton submitted that the work was to be executed for 3,000*l.* The work occupied from October, 1900, to June, 1901; and Mr. McCall contended that on the letters between the parties, if there was a limit to 3,000*l.* it applied only to the year 1901, the instructions being that the plaintiffs were to prepare a scheme which would be capable of development and on which there would be much larger expenditure than 3,000*l.* in the year 1901. In the communications which passed various alternative tender were submitted to the agent, who decided that the highest was too expensive and the lowest unworkable. Suggestions were made by which portions of the scheme should be omitted, and on this part of the case Mr. Walton put it that the letters showed that even with these reductions on a higher tender the work was not to cost more than 3,000*l.*

His Lordship pointed out that the plaintiffs had charged 3 per cent. on a scheme which was to cost about 5,000*l.*, as well as 3 per cent. on a smaller scheme. Could they charge 3 per cent. on both schemes?

Mr. McCall contended that the plaintiffs were within their rights in doing so, as they had received instructions to prepare both schemes. The expert evidence would show that this was the ordinary practice of the profession. The plaintiffs had written to Mr. Walker that he could not expect them to go to the trouble of preparing a scheme and inviting tenders without compensating them for their trouble. In a further letter the plaintiffs had pointed out that it was unreasonable to expect the same results for 3,000*l.* as could have been obtained from an original estimate amounting to almost twice that sum.

Mr. Walton suggested that an answer to an application by plaintiffs for a payment on account of fees should be read.

Mr. McCall read the reply of Mr. Walker, which was to the effect that he would not pay any fees because he considered that the plaintiffs' charges were exorbitant and that Lord Wenlock was entitled to damages because of the inferior work which had been done.

Mr. E. R. Dolby, one of the plaintiffs, gave evidence of interviews he had with Mr. Walker as to the installation, and stated that he was told the defendant did not want to spend more than 3,000*l.* in the first year, and subsequent work was left open for future consideration. Mr. Walker, in a letter dated March 27, 1901, had agreed to spend 3,260*l.* in the first year, and the tender submitted was for 3,040*l.* That was a workable scheme, the lower figure having been arrived at by reducing the size of the battery. The 3 per cent. was charged on the smaller scheme as well as on the original one because plaintiffs had to prepare fresh drawings and arrange the plant in a different manner. Mr. Walker never said there was a limit of 3,000*l.*, and plaintiffs were only to be paid for that. Plaintiffs prepared a scheme of which sections could have been carried out for 3,000*l.*, but Mr. Walker put in other sections, which raised the cost. The work which had been carried out by

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others were according to the plans prepared by plaintiffs.

Mr. Walton said he did not dispute that the scheme which had been carried out was workable, but what he did suggest was that the plaintiffs had prepared a scheme which was not workable, and for which they charged their fees.

Mr. Dolby, continuing, said the charges of the plaintiffs were fair and reasonable, and according to the usual practice. In cross-examination he claimed that an electrical engineer was entitled to be paid scale fees, even if the scheme was not approved.

Mr. Birstal, electrical engineer, said the charges made by the plaintiffs were usual in the profession.

Cross-examined, the witness said, generally speaking, he agreed that the estimate should be carried out for within 20 per cent. of the figure quoted before the engineer could be considered as entitled to his fees.

Mr. Walton, for the defence, said that the defendant was anxious that the plaintiffs should be paid something, and he considered the sum paid into court ample payment for the services the plaintiffs had rendered. The limit of 3,000*l.* had been fixed upon, but plaintiffs had submitted a scheme costing far more than that sum, and the 150*l.* was paid into court in respect of such portion of their services as had proved useful to the defendant.

Mr. Francis Elliot Walker, the defendant's agent, gave evidence to the effect that from the beginning to the end the limit as to 3,000*l.* was insisted upon. A tender was obtained for 3,800*l.*, but witness refused it, and he put an end to the matter. The plaintiff's then sent in a mutilated scheme for 3,040*l.* Had he been aware that the plaintiffs' estimate might be exceeded by above 20 per cent. he would not have agreed to it. He was limited by Lord Wenlock to 3,000*l.*

Mr. E. A. Grüning, architect, said that in a case where the design sent in was more costly than the estimate the range allowable was within 10 per cent. of that estimate before the architect could claim his 3 per cent. That was the custom of his profession, though it was not the law.

His Lordship asked whether there was any objection to payment by *quantum meruit?*

Mr. McCall said he was quite ready to take six guineas a day.

Mr. Watney, electrical and consulting engineer, said if an estimate was made it should be carried out at a figure within about 10 per cent. of it.

Mr. Walton submitted that all the plans had been obviously experimental, and taking the seven days during which Mr. Dolby was occupied at six guineas a day, together with incidental work in London, that would give a sum of about 50*l.* Three times that amount had already been paid into court, and considering that, strictly speaking, Mr. Dolby was entitled to nothing, his estimate having been exceeded, he had been very justly dealt with.

His Lordship, in giving judgment, said it was pretty clear that there was no rule as to charging 3 per cent. on either the tender or anything else, nor was there any custom prevailing as to the margin that could reasonably exist as between the estimate of the electrical engineer and the tender by which he was able to get the work done. The questions were whether the plaintiffs were entitled to anything at all, or whether they were to be paid by *quantum meruit.* On the whole, he came to the conclusion that the sum paid into court was sufficient to meet the claim, but as it had been paid in with a denial of liability, judgment would be for the plaintiffs, with costs down to the time of such payment into court.

No order was made as to the costs in court.

MEETINGS.

FRIDAY, MARCH 14.

Architectural Association Discussion Section.—Mr. H. C. Lander on "Co-operative Homes." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Professor R. Elsey Smith on "Sanitary Building Construction and Planning: Soil and Local Physical Conditions." 7 p.m.

Institution of Junior Engineers. (Westminster Palace Hotel).—Paper on "The Uses of Engineering Models," by Mr. Percival Marshall, Chairman. 8 p.m.

Institution of Civil Engineers.—(Students' meeting). —Mr. H. J. Deane, B.E., on "The Use of Long Steel Wires in Surveying." 8 p.m.

Sheffield Society of Architects and Surveyors.—Paper by Mr. T. G. Jackson, R.A.

SATURDAY, MARCH 15.

Institution of Junior Engineers.—Conversazione at the Westminster Palace Hotel. Reception at 7 p.m. by the President (Sir John Jackson, F.R.S.E.) and Lady Jackson, the Chairman and Mrs. Marshall.

Royal Institution.—Right Hon. Lord Rayleigh, M.A., on "Some Electrical Developments." V. 3 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage Works, Sutton, Surrey. 3 p.m.

Hartley College Engineering Society, Southampton.—Mr. S. W. Smith on "The Microstructure of Steel." 7 p.m.

MONDAY, MARCH 17.

Royal Institute of British Architects.—Mr. Sidney K. Greenslade on "The Planning of some Recent Library Buildings in the United States," with lantern illustrations. 8 p.m.

Society of Arts (Cantor Lectures).—Mr. J. D. Geddes, F.R.P.S. on "Photography Applied to Illustration and Printing."—III. 8 p.m.

Royal Philosophical Society of Glasgow (Architectural Section).—Mr. A. G. Wallis, C.E., on "Some Details of Modern Sanitary Practice." 8 p.m.

TUESDAY, MARCH 18.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. Spinks on "Ventilation, Warming, and Lighting." 7 p.m.

Institution of Civil Engineers.—Paper to be further discussed: "Electrical Traction on Railways," by Messrs. W. M. Mordey and Bernard M. Jenkin. On the conclusion of this discussion, the following Papers will be read: "The Greenwich Footway Tunnel," by Mr. W. C. Copperthwaite; "Subaqueous Tunnelling through the Thames Gravel—Baker-street and Waterloo Railway," by Mr. Arthur H. Haigh. 8 p.m.

WEDNESDAY, MARCH 19.

Society of Arts.—Mr. J. Clifton Robinson on "Electric Traction: London's Tubes, Trams, and Trains." 8 p.m.

Sanitary Institute.—Mr. H. Percy Boulnois on "The Collection and Disposal of Refuse in Large Towns." 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—(1) Inspection in the District of Islington and at the Borough Disinfecting Station. 2 p.m. (2) Mr. W. Spinks on "Calculations, Measurements, and Plans and Sections." 7 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Institution of Electrical Engineers (Birmingham Local Section).—Mr. R. P. Hulse on "Tests on the Nernst Lamp" (communicated by Mr. D. K. Morris). 7.30 p.m.

Institution of Civil Engineers.—Students' visit to the works of the Incandescent Electric Lamp Co., Ltd., Brook Green, Hammersmith. Assemble at the works, 2.15 p.m.

THURSDAY, MARCH 20.

Carpenters' Hall, London Wall (Free Lectures on Matters connected with Building).—Mr. J. A. Gotch, F.S.A., on "Early Renaissance Buildings in England." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. Spinks on "Sanitary Appliances." 7 p.m.

Institution of Electrical Engineers.—Mr. James Swinburne and Mr. W. R. Cooper, M.A., on "Problems of Electric Railways." 8 p.m.

FRIDAY, MARCH 21.

Architectural Association.—Mr. W. H. Lever on "The Dwellings erected at Port Sunlight and Thornton Hough." 7.30 p.m.

Royal Institution.—Geheimrath Professor Otto N. Witt on "Recent Developments in Colouring Matter." 9 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. Spinks on "House Drainage." 7 p.m.

Institution of Mechanical Engineers.—Papers to be read, and discussed collectively:—"Fencing of Steam and Gas Engines," by Mr. Henry D. Marshall; "Fencing or Guarding Machinery used in Textile Factories," by Mr. Samuel R. Platt; "Protection of Lift-shafts, and Safety Devices in connection with Lift-doors and Controlling Gear," by Mr. Henry C. Walker; "Guarding Machine Tools," by Mr. W. H. Johnson. 8 p.m.

Birmingham Architectural Association.—Mr. G. A. Cox on "The B.A.A. Excursion to Burford," illustrated by Mr. J. Ward.

Glasgow Architectural Craftsmen's Society.—Messrs. J. McLeod and A. W. R. Bell on "Prevention of Damp in Walls." 8 p.m.

SATURDAY, MARCH 22.

Sanitary Institute (Demonstration for Sanitary Officers). — Inspection at Beddington Sewage Farm. 3 p.m.

Edinburgh Architectural Association.—Visit to Glasgow under the auspices of the Glasgow Architectural Association.

Royal Institution. — Rt. Hon. Lord Rayleigh on "Some Electrical Developments." VI. 3 p.m.

Dundee Institute of Architecture.—Visit to Leuchars Church and Earlsball.

Hartley College Engineering Society (Southampton).—Mr. D. R. Bennett on "The Construction of Roads and Streets." 7 p.m.

Architectural Association.—Fourth spring visit, to (1) the Roman Catholic Cathedral, Ashley-gardens, Victoria-street, Westminster, 2.30 p.m.; (2) New Police-station at Cannon-row (New Scotland Yard), 4 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 28.—By G. B. HILLIARD & SON (at Chelmsford).

Blackmore, Essex.—The Elm Farm, 30 a. 0 r. 24 p., c., y.r. 41*l.* £500
Ingatestone, Essex.—Mill-green, a copyhold house, y.r. 20*l.* 300
Fryerning, Essex.—A copyhold cottage and enclosure, 3 a. y.r. 9*l.* 10s. 150
Cottage, four tenements and two plots of land, c., y.r. 22*l.* 350

By E. & S. SMITH.

Kentish Town.—76, Weedington-rd., u.t. 51 yrs., g.r. 8*l.*, y.r. 40*l.* 275
Muswell Hill.—Tetherdown, Laurel Lodge, f., e.r. 65*l.* 910

By A. H. TURNER & Co.

Horsell, Surrey.—The Cottage, f., p. 1,000
Clapham.—244 and 246, Clapham-rd., u.t. 35 yrs., g.r. 22*l.* 10s., p. 1,295

March 3.—By HARMAN BROS.

Fulham.—34, Estercombe-av., u.t. 94 yrs., g.r. 8*l.* 8s., e.r. 55*l.* 680
Hackney.—9, The Broadway (S), u.t. 43½ yrs., g.r. 6*l.* 10s., e.r. 75*l.* (including fixtures) 615

By BELLAMY & Co. (at Walham Green).

Fulham.—60 and 62, Epirus-rd., u.t. 77½ yrs., g.r. 11*l.*, w.r. 83*l.* 4s. 670

March 4.—By DEBENHAM, TEWSON, & Co.

Mayfair.—2, Hill-st., u.t. 44½ yrs., g.r. 150*l.*, p... 5,000

By BOWDITCH & GRANT.

Croydon.—Chatsworth-rd., Roselea, f., p. 1,750

By EASTMAN BROS.

Sydenham.—1, Venner-rd., u.t. 76½ yrs., g.r. 9*l.*, q.r. 40*l.* £280

By FOSTER & CRANFIELD (on premises).

Hackney.—15, Dinmont-st., with yard, stabling, &c., u.t. 13½ yrs., g.r. 7*l.* 15s., p. 1,025

March 5.—By PERCY H. CLARKE.

Streatham.—Babington-rd., Frating, f., e.r. 85*l.*... 1,250
Kentish Town.—44, Castle-rd., u.t. 33 yrs., g.r. 5*l.*, q.r. 38*l.* 330
53 and 55, Lewis-st., u.t. 56 yrs., g.r. 10*l.*, y.r. 54*l.* 550
9 and 11, Quadrant-gr., u.t. 56 yrs., g.r. 10*l.* 10s., y.r. 51*l.* 480
35, Hadley-st., u.t. 56 yrs., g.r. 5*l.*, q.r. 28*l.*... 275
Brixton.—40 and 42, Tindal-st., u.t. 59½ yrs., g.r. 8*l.*, w.r. 67*l.* 12s. 460
Herne Hill.—46, Milkwood-rd. (S), u.t. 64 yrs., g.r. 7*l.*, y.r. 40*l.* 395
Southwark.—242 Tabard-st. (coffee shop), u.t. 34½ yrs., g.r. 7*l.*, y.r. 34*l.* 290

By FOSTER & CRANFIELD.

Camberwell.—Elmington-ter., f.g. rents 56*l.* 14s., reversion in 78 yrs. 1,430
Forest Hill.—62, St. Germain's-rd., f., y.r. 30*l.* .. 580
Broadstairs, Kent.—2, Belmont-rd., f., y.r. 25*l.* .. 370
8, High-st. (S), f., y.r. 31*l.* 790
Canning Town.—Victoria Dock-rd., f.g. rents 38*l.* 10s., reversion in 257 yrs. 950
Bethnal Green.—355, Cambridge-rd. (S), u.t. 183 yrs., g.r. 8d., y.r. 40*l.* 630

By FRANK JOLLY & Co.

Clapton.—21 and 23, Pembury-rd., u.t. 49½ yrs., g.r. 10*l.*, y.r. 110*l.* 1,365
Forest Gate.—53, 55, and 57, Wellington-rd., f., w.r. 67*l.* 12s. 725

By HENRY MORTEN.

Highbury.—25, Poet's-rd., u.t. 47½ yrs., g.r. 5*l.* 18s., e.r. 42*l.* 435

By A. PREVOST & SON.

Limehouse.—2, Rich-st., f., w.r. 31*l.* 4s. 460
Poplar.—26, 27, 28 and 29, Sussex-st., u.t. 51 yrs., g.r. 12*l.*, w.r. 130*l.* 900
23 to 33 (odd), Northumberland-st., u.t. 63½ yrs., g.r. 15*l.*, w.r. 150*l.* 16s. 1,130
Mile End.—85, 87 and 89, Carlton-rd., u.t. 27 yrs., g.r. 8*l.*, q.r. 88*l.* 820

By DOUGLAS YOUNG & Co.

Stockwell.—3, 5, and 7, Stockwell Pk.-cres., u.t. 24 yrs., g.r. 27*l.*, y.r. 129*l.* 785
Kennington.—57, Kennington Oval, y.r. 50*l.*; also l.g. rents 25*l.* 10s., u.t. 17½ yrs., g.r. 20*l.* 425
Battersea.—39, Bridge-rd. West, u.t. 40 yrs., g.r. 11*l.*, y.r. 40*l.* 300
Streatham.—158 to 180 (even), Wellfield-rd., u.t. 57¾ yrs., g.r. 60*l.*, w.r. 436*l.* 16s. 2,720

By WYATT & SON (at Chichester).

Chichester.—23, Lennox-pl., f., w.r. 9*l.* 2s. 100
47, York-rd., f., w.r. 14*l.* 6s. 195

March 6.—By EDWARD J. CARTER.

Tunbridge Wells, Kent.—The Broadway, f.g.r. 25*l.*, reversion in 67½ yrs. 840
Mount Pleasant, f.g.r.s 1,625*l.*, reversion in 71 yrs. 5,520
Calverley Pk., f.g.r. 50*l.*, reversion in 67½ yrs... 1,660

By GLASIER & SONS.

Hyde Park.—83, Westbourne-ter. and 93, Eastbourne-mews, u.t. 35½ yrs., g.r. 50*l.*, p. 2,725
Kensington.—21, Campden House-rd., u.t. 70 yrs., g.r. 30*l.*, p. 1,700

By NORMAN & SON.

Whitechapel.—High-st., Size-yd., comprising workshops, warehouses, stables, &c., u.t. 46½ yrs., g.r. 450*l.*, y.r. 550*l.* 1,500

March 6.—By NEWBON, EDWARDS, & SHEPHARD.

Islington.—Upper-st. (Hare and Hounds Yard), c.g.r. 35*l.*, reversion in 25 yrs. 760
8, Church-st., f., y.r. 42*l.* 10s. 875
255, Upper-st. (s), and 5, Swan-yard, f., y.r. 225*l.* 5,675
41 and 43, Northampton-st., u.t. 16½ yrs., g.r. 10*l.*, w.r. 97*l.* 10s. 350
Fulham.—18 and 22, Star-rd., with stabling, f., y.r. 140*l.* 1,630
Anerley.—171, Croydon-rd., u.t. 68 yrs., g.r. 15*l.*, e.r. 60*l.* 300
Holloway.—Charles-st., Victoria Cottage, u.t. 32 yrs., g.r. 8*l.*, y.r. 50*l.* 360
Forest Hill.—10, Waldenshaw-rd., u.t. 79 yrs., g.r. 11*l.*, e.r. 55*l.* 235
Kingston-on-Thames, Surrey.—19, Birkenhead-av., u.t. 82 yrs., g.r. 10*l.* 10s., y.r. 40*l.* 255

By REYNOLDS & EASON.

Barnes.—57 to 75 (odd), Railway-st., and 11, Cross-street, f., w.r., 189*l.* 14s. 2,310
Whitechapel.—167, Whitechapel-rd., u.t. 38½ yrs., g.r. 32*l.*, p. 710
City of London.—14, Cheapside (s.), beneficial lease for 6¾ yrs., y.r. 375*l.* 860

By WM. STEVENS.

Hackney, 11, St. Mark's-villas, u.t. 64 yrs., g.r. 6*l.*, e.r. 42*l.* 450

By STIMSON & SONS.

Bermondsey.—102, Drummond-rd., u.t. 42 yrs, g.r. 4*l.*, y.r. 45*l.* 420
Camberwell.—9, 10, 11, and 12, Station-ter., u.t. 53 yrs., g.r. 4*l.*, y.r. 131*l.* 1,500
Dulwich.—31, Underhill-rd., u.t. 66 yrs., g.r. 10*l.*, y.r. 40*l.* 270
Battersea.—77 and 78, Eccles-rd., u.t. 78½ yrs., g.r. 13*l.*, y.r. 60*l.* 595
Wandsworth.—140, 142, and 144, Bennerley-rd., u.t. 79½ yrs., g.r. 19*l.* 10s., y.r. 96*l.* 895

March 7.—By G. ERNEST CLARKE.

Walthamstow.—10, 12, and 14, Clarendon-rd., f., w.r. 69*l.* 16s. 1,030
41, Prospect-hill, u.t. 61½ yrs., g.r. 14*l.* 17s. 6d., p. 600
Leyton.—66, 68, and 70, Sophia-rd., u.t. 80½ yrs., g.r. 7*l.* 10s., w.r. 66*l.* 6s. 365

By VINCENT S. LEIGH.

Hackney.—23 and 24, Church-st., u.t. 40½ yrs., g.r. 14*l.*, y.r. 84*l.* 735
Tottenham.—378, West Green-rd., u.t. 19½ yrs., g.r. 4*l.*, w.r. 31*l.* 4s. 100

By LINNETT & LANE.

Willesden.—10, The Ravenscroft, u.t. 79 yrs., g.r. 3*l.* 9s. 8d., e.r. 32*l.* 295

[See also page 277.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Proposed Public Offices	Aldershot U.D.C.	100*l.*, 75*l.*, and 50*l.*	Mar. 29
*Accident Hospital	Mexborough Montagu Hospital	25*l.*, 10*l.*	May 1
*Public Free Library Buildings	Ilkeston Town Council	50*l.*, 25*l.*, and 12*l.* 10*s.*	No date

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Water Supply Works, Selston	Basford R.D.C.	S. Maylan, Surveyor, Public Offices, Basford	Mar. 17
Schools, Hazlehurst	Walmersley & Ramsbtm. U.D.S.B	T. Bell, Architect, 14, Grimshawe-street, Burnley	Mar. 18
Water Supply Works, Antrim	County Asylum Committee	J. Barton, Engineer, Exchange Buildings, Dundalk	do.
Footpaths, &c.	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, Tynemouth	do.
*Making-up Roads	Tottenham U.D.C.	W. H. Prescott, 712, High-road, Tottenham	do.
Road Materials	Uckfield R.D.C.	—. Miles, 173, High-street, Lewes	Mar 19
Hall, Barry, Wales	Bradford Co-operative Soc., Ltd.	G. Thomas, Architect, Queen-street, Cardiff	do.
Additions to Stores, Brownroyd	Borough of Cheltenham	Rycroft & Firth, Architects, Bank Buildings, Bradford	do.
Villa, Sheffield-road, Barnsley	Metro. Borough St. Marylebone	Crawshaw & Co., Architects, 13, Regent-street, Barnsley	do.
*Portland Cement	Cuckfield (Sussex) R.D.C.	Borough Surveyor, Municipal Offices, Cheltenham	Mar. 20
*Carting away Slop and Sweepings from Streets	Batley Co.-operative Soc., Ltd	J. Paget Waddington, Town Hall, Marylebone-lane, W.	do.
Sewerage Works, Ardingley	Rothwell U.D.C.	—. Beach, Surveyor, Munster Green, Haywards Heath	do.
Additions to Business Premises	Mr. T. Irving	H. B. Buckley, Architect, 85, Commercial-street, Batley	do.
Granite Road Metal, &c. (5,000 tons) near Leeds	Chelmsford Star Co-op., Society	J. T. Pears, Surveyor, Council Offices, Rothwell	do
Houses, Undercliffe, Bradford	Durham Corporation	Empsall & Clarkson, Architects, Exchange, Bradford	do.
Three Cottages, Broughton Moor, Cumberland	Mayo County Council	B. Eilbeck, Dearham, Maryport	do.
Business Premises, South-street, Chichester	Dartford R.D.C.	Messrs. Shippam, South-street, Chichester	do
Coach-house, &c., Alnwick Castle	St. Marylebone Guardians	T. Pickard, Estates Office, Alnwick Castle	Mar. 21
Additions to Stores, Moulsham-street	do.	C. & W. H. Pertwee, Architect, Bank Chambers, Chelmsford	Mar. 22
Paving Works, &c.	Barrow-in-Furness Corporation	City Surveyor, Town Hall, Durham	Mar. 24
Bridge Works, Belmullet	Blackwell R.D.C.	J. Clarke, Court House, Castlebar	do.
Cottages, Slades Green, near Erith	Ely (Cambs) R.D.C.	Tait & Hobbs, Architects, Dartford	do.
Painting, &c., Schools at Southall	London County Council	Superintendent, St. Marylebone Schools, Southall	do.
Painting, &c., Infirmary, Rackham St., Notting Hill	Bromley U.D.C.	Steward of Infirmary	do.
Church Works	do.	Watt & Tulloch, Architects, Belfast	do.
Lavatories, &c., Old Town Hall	Maidenhead Town Council	Borough Engineer, Town Hall, Barrow	Mar. 25
Road Works, Selwyn-street, near Mansfield	Strood (Kent) R.D.C.	H. Silcock, Surveyor, 34B, Westgate, Mansfield	do
Granite Road Metal, &c.	Essex County Council	—. Ennals, Surveyor, Egremont-street, Ely	do.
*Ottawa and Baffin Buildings, Prestons-road, Poplar	Malden and Coombe U.D.C.	Architect's Department, Housing Branch, 18, Pall Mall East, S.W.	do.
*Kerbing, Channelling, and Tar Paving	Brentford Union	Council's Surveyor, Bromley, Kent	do
*Works and Materials	West Ham Borough Council	Council's Offices, Bromley, Kent	Mar. 26
*Erecting Electric Generating Station	Wimbledon U.D.C.	Council Surveyor, Guildhall, Maidenhead	do.
Road Materials, &c.	Boro' of Kingston-on-Thames	G. W. Prall, Workhouse, Strood	do.
Chapel and School, Bridgwater	North Eastern Railway	R. M. Challice, Architect, 14, Bedford-circus, Exeter	Mar. 27
*New Bridge, Sutton Ford, near Rochford		County Offices, Duke-street, Chelmsford	Mar 31
Road Materials, &c, New Malden		T. V. H. Davison, Cambridge-road, New Malden	April 1
*Percy House Schools, Isleworth		W. H. Ward, Paradise-street, Birmingham	do.
*Public Library, Plaistow		Town Clerk, Town Hall, West Ham, E.	do.
*Making-up Roads		Council's Surveyor, The Broadway, Wimbledon	April 3
*Additional Buildings for St. James's-road Schools		Borough Surveyor, Kingston-on-Thames	April 4
*Excavator, Bricklayer, and Mason's Work at York		W. Bell, Architect, York	No date
Barn, &c., Plumtree Farm, Bawtry		T. Shearman, 10 and 11, Oriental Chambers, Doncaster	do.
Infirmary, Northampton		C. S. Risbee, Northampton	do.
Church, Boulevard, Hull		T. B. Thompson, Architect, 15, Parliament-street, Hull	do.
Church, Builth Wells, Wales		Habershon & Co., Architects, Pearl-street, Cardiff	do.
Road Works, New Forest		County Surveyor, The Castle, Winchester	do.
Works at Lodge, at Cemetery	Hoddesdon (Herts) Burial Board	P. R. Longmore, High-street, Hoddesdon	do.
Stables, Granville-street, Grimsby		J. & C. Popple, Fish Dock-road, Grimsby	do
Additions to Institution, Topsham-road, Exeter		J. Jerman, Architect, 5, Bedford-circus, Exeter	do
Road Metal, &c., near Wakefield	Hemsworth (Yorks) R.D.C.	T. H. Richardson, Surveyor, Hemsworth	do
Warehouse Offices, York-place, Leeds		T. H. Rhodes, Architect, 17, Hyde-terrace, Leeds	do.
Alterations to The Hall, Abergavenny	Mr. E. P. Martin	E. A. Johnson, Architect, Abergavenny	do.
Additions to Premises, West End, Bedlington	Bedlingtonshire U.D.C.	C. Brown, C.E., Bedlington	do.
Chapel, Oulton, Lowestoft	Sheerness Permanent Bldg. Socty.	F. W. Richards, Architect, Stanley-street, Lowestoft	do.
*Residence and Offices		W. L. Grant, Architect, Sittingbourne	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Applications to be in
*Clerk of Works (3)	Manchester Corporation	3*l.* 3*s.* per week each	Mar. 18
*Building Inspector	City of Sheffield	120*l.*	Mar. 24
*Clerk of Works	London County Council	3*l.* 13*s.* 6*d.* per week	do.
Clerk of Works	Slough U.D.C.	3*l.* per week	Mar. 29
*Temporary Architectural Assistant	Grimsby Corporation	120*l.*	April 2
Clerk of Works	St. Pancras Borough Council	3*l.* 10*s.* per week	No date
*Foreman of Works	Gold Coast Government	250*l.*	do.

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, xix. xx. & xxii.

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By ERNEST OWERS.

Hampstead.—184, Belsize-rd., u.t. 52½ yrs., g.r. nil, e.r. 110*l.* £1,000

By THOLE & NEWMAN.

Chelsea.—88, Beaufort-st., u.t. 72 yrs, g.r. 10*l.*, y.r. 75*l.* 760

Battersea.—58 and 60, Winstanley-rd., (S.), u.t. 76 yrs., g.r. 11*l.*, w.r. 67*l.* 12s. 390

By TOWERS, ELLIS & CO.

Bayswater.—72, Westbourne Park-rd., u.t. 31½ yrs., g.r. 7*l.*, p. 615

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 11 6	per 1,000 alongside, in river.
Rough Stocks and Grizzles	1 9 6	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 5 0	,, ,, ,,
Fletton	1 8 0	,, at railway depôt.
Red Wire Cuts ..	1 12 0	,, ,, ,,
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,, ,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,, ,,
Do., Bullnose	4 10 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 5 6	,, ,, ,,
GLAZED BRICKS		
Best White and Ivory Glazed Stretchers.....	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers..	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers..	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	14 0 0	,, ,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,, less than best.
	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	32 0	per ton, delivered.
Best Ground Blue Lias Lime..	25 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. 0d. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depôt.
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 3	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks ..	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup)	2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.
,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	12 0 0	per 1000 of 1200 at ry. dep.
,, best seconds ,,	11 10 0	,, ,,
16× 8 best ,,	6 15 0	,, ,,
20×10 best blue Portmadoc ..	11 5 0	,, ,,
16×8 best blue Portmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green....	12 2 6	,, ,,
16× 8 ,, ,,	7 5 0	,, ,,
20×10 permanent green	10 5 0	,, ,,
16×8 ,, ,,	5 17 6	,, ,,

PRICES CURRENT (*Continued*).

TILES.

	s. d.	
Best plain red roofing tiles..	41 6	per 1,000, at rly. depôt.
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	£ s. d.	£ s. d.	
	At per standard.		
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	14 10 0	16 0 0	
Deals: best 3 by 9.....	13 10 0	15 0 0	
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in	10 10	11 10 0	
Battens: best 2½ by 6 and 3 by 6 .	0 10 0	less than 7 in. and 8 in.	
Deals: seconds	1 0 0	less than best	
Battens: seconds	0 10 0	,, ,, ,,	
2 in. by 4 in. and 2 in. by 6 in. .	8 10 0	9 10 0	
2 in. by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0 0	
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.	
¾ in.	1 6 0	,,	
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Swedish balks.....	2 15 0	3 0 0	
Pitch-pine timber (30 ft.).....	3 0 0	3 10 0	
JOINERS' WOOD.	At per standard.		
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0	
3 in. by 9 in.	20 0 0	21 0 0	
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0	
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0	
,, ,, 3 in. by 9 in.	16 10 0	18 10 0	
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0	
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0	
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0	
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0	
Do. 3 in. by 9 in.	17 0 0	18 0 0	
Battens.....	13 0 0	14 0 0	
Second yellow deals, 3 in. by 11 in.....	15 0 0	16 10 0	
Do. 3 in. by 9 in.	13 10 0	14 10 0	
Battens.....	11 0 0	12 0 0	
Third yellow deals, 3 in. by 11 in.....	12 10 0	13 10 0	
Do. 3 in. by 9 in.	12 0 0	13 0 0	
Battens.....	10 0 0	11 0 0	
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 0 0	15 0 0	
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0	
Battens.....	11 0 0	12 0 0	
Second white deals 3 in. by 11 in.	13 0 0	14 0 0	
,, ,, ,, 3 in. by 9 in.	12 0 0	13 0 0	
,, ,, ,, battens.....	9 10 0	10 10 0	
Pitch-pine: deals	16 0 0	18 0 0	
Under 2 in. thick extra	0 10 0	1 0 0	
Yellow Pine—First, regular sizes..	32 0 0	33 10 0	
Broads (12 in. and up).....	2 0 0	more.	
Oddments	22 0 0	24 0 0	
Seconds, regular sizes	24 10 0	26 10 0	
Yellow Pine Oddments	20 0 0	22 0 0	
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6	
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0	
Small ,, ,, ...	0 2 3	0 2 6	
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6	
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8	
¾ in. do. do.	0 0 7	- - -	
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11	
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0	
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0	
Teak, per load	16 0 0	20 0 0	
American Whitewood Planks— Per ft. cube.....	0 3 0	0 3 6	
Prepared Flooring—	Per square.		
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6	
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6	
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0	
6 in. at 6d. per square less than 7 in.			
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6	
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6	
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6	
6 in. at 6d. per square less than 7 in.			

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars.....	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 9	9 0 0

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London £ s. d.	£ s. d.
IRON—		
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars.....	9 0 0	9 1. 0
Hoop Iron, basis price.....	9 5 0	9 15 0
,, ,, galvanised.....	10 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.....	10 0 0	- - -
,, ,, to 24 g.....	11 0 0	- - -
,, ,, to 26 g.....	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.....	14 0 0	- - -
Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g.....	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.....	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 10 0	10 0 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 5 0	- - -
Pipe in coils	14 15 0	- - -
Soil Pipe.....	17 5 0	- - -
ZINC—Sheet— Vieille Montagne..... ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet..... per lb.	0 1 0	- - -
Thin ..... ,,	0 1 1½	- - -
Copper nails..... ,,	0 1 1½	- - -
BRASS— Strong Sheet..... ,,	0 0 11	- - -
Thin ,, ...	0 1 1	- - -
TIN—English Ingots..... ,,	0 1 3	- - -
SOLDER—Plumbers' ..... ,,	0 0 6½	- - -
Tinmen's ..... ,,	0 0 8	- - -
Blowpipe ..... ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths.....	,, ,,
26 oz. thirds	,, ,,
,, fourths	,, ,,
32 oz. thirds	,, ,,
,, fourths	,, ,,
Fluted sheet 07.....	,, ,,
,, ,, ... 3d.	,, ,,
½ Hartley's Rolled Plate ..... 4d.	,, ,,
⅝ ,, ,, ,, ... 2d.	,, ,,
¾ ,, ,, ,, ... 2½d.	,, ,,
½ ,, ,, ,, ... 2¾d.	,, ,,

OILS, &c.

	£ s. d.	
Raw Linseed Oil in pipes.....	per gallon	0 2 9
,, ,, ,, in barrels	,,	0 2 10
,, ,, ,, in drums	,,	0 3 0
Boiled ,, ,, in pipes	,,	0 2 11
,, ,, ,, in barrels	,,	0 3 0
,, ,, ,, in drums	,,	0 3 2
Turpentine, in barrels	,,	0 2 6
,, in drums	,,	0 2 8
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	,,	20 10 0
Best Linseed Oil Putty	per cwt.	0 8 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work ..	0 16 6
Best Elastic Copal Varnish for outside work ..	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work.....	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work.....	0 16 0
Best Hard Copal Varnish for inside work.....	1 0 0
Best Hard Carriage Varnish for inside work....	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BRENTWOOD.—For repairs to the Spread Eagle, Brentwood. Messrs. Foulsham & Herbert Riches, architects, 3, Crooked-lane, London, E.C., and Bromley-by-Bow, E.:—

T. Bruty* £286

LONDON.—For additions to stabling, Streatham Common, S.W. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C.:—

Courtney & Fairbairn	£549	Smith & Sons, Ltd.	£489
W. Mason	495	Candler & Sons*	469

LONDON.—For internal decorations to a house, Streatham Common, S.W. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C.:—

Smith & Sons, Ltd.	£668	Maple & Co., Ltd.*	£565
Candler & Sons	647		

LONDON.—For the erection of stabling, Wanstead, N.E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, E.C.:—

Osborn & Sons	£729	Battley, Sons, & Holness*	£635
W. Mundy	702		
C. J. Sherwood	691		

LONDON.—For repairs, &c., to the Joiners' Arms, Stratford, E. Messrs. Foulsham & Herbert Riches, architects, 3, Crooked-lane, E.C., and Bromley-by-Bow, E.:—

E. F. & T. J. Walker	£258	S. Salt*	£207
A. W. Derby	239		

LONDON.—For repairs at the Albion, Stratford, E. Messrs. Foulsham & Herbert Riches, architects, 3, Crooked-lane, King William-street, E.C., and Bromley-by-Bow, E.:—

A. Webb	£345	J. T. Robey	£295
T. Osborn & Sons	327	E. F. & T. J. Walker*	287

LONDON.—For the erection of new banking premises at the corner of Pall-mall and Waterloo-place, S.W. (site of the Old Wanderers' Club), for Sir Henry Seymour King, M.P. Mr. A. E. Thompson, architect, Leadenhall Buildings, E.C.:—

Foster & Dicksee	£27,777	Maple & Co.	£22,924
Holloway Brcs.	27,200	J. Carmichael	22,280
Simpson & Son	24,657	Patman & Fotheringham*	21,963
W. Downs	23,243		

LONDONDERRY.—For the erection of (1) villa residence and (2) pair of semi-detached villas, Clooney Park, for Mr. J. A. Hamilton, solicitor, Derry. Mr. R. Eccles Buchanan, C.E., Castle-street, Londonderry:—

	Villa.		Semi-detached.
J. A. Fulton	£1,260	..	£2,000
Shannon & Routledge	1,050	..	1,700
Smyth Bros.	1,100	..	1,580
Robt. Colhoun, Strand*	1,050	..	1,500

SEACROFT.—For infectious diseases hospital, for the City of Leeds. Mr. Edwin T. Hall, architect, 54, Bedford-square, London:—

William Airey	£239,423	Armitage & Hodgson	£221,392
Roper & Sons	237,233	Nicholson & Son	211,992
Shillitoe & Sons	237,000	Arnold & Son*	198,500
Obank & Sons	234,601		

[Separate tenders were received for letting the work to the different trades, but the total of the lowest of all these was £223,591.]

WALTON.—For drainage work, Walton-on-Thames, Surrey. Messrs. Foulsham & Herbert Riches, surveyors, 3, Crooked-lane, King William-street, London, E.C., and Bromley-by-Bow, E.:—

E. J. Ingram	£198 0	Gaze & Sons	£167 0
B. Ingram & Co.	175 0	Luker & Son*	149 10

WALTHAMSTOW.—For forming new roads and construction of sewers and water drains on the Thorpe Hall Estate, for Mr. C. J. Geary. Mr. F. Selby, surveyor, 44, Chancery-lane:—

E. Wilson	£995 0	G. Wilson	£918 0
W. & C. French	949 15	A. W. Porter*	868 0

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The Builder.

VOL. LXXXII.—No. 3085. MARCH 22, 1902.

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Trowel Used by the King in Laying Foundation-Stone of Naval College, Dartmouth ..... From Photographs.
Design for Wall Decoration of a Bath-room ..... By Mr. C. H. Temple.
Residences, Weetwood, near Leeds ..... Mr. W. H. Thorp, F.R.I.B.A., architect.
Additions to "Bishopsford," Mitcham ..... Mr. Halsey Ricardo, architect.
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*Building Contracts.**

LIKE most maxims, that of Pope that "A little learning is a dangerous thing" contains about an equal amount of truth and error. For every builder and architect who has anything like a real business to conduct must have some acquaintance with legal principles in regard to those questions of law which are concerned with building contracts. The architect especially must know, not only what are his own rights and duties, but also those of the contractor in relation to the building owner. At the same time, while each of these persons, architect or contractor, should know certain general principles, there is nothing more dangerous than for him to enter into legal details which should be kept entirely to lawyers. It is unfortunate, perhaps, that the nature of building contracts enables the law which affects them to be connected in a somewhat systematic manner with the general course of a building contract.

Speaking broadly, there is first of all the engagement of the architect by the building owner. There then follows the arrangement of the contract between the latter and the contractor; the carrying out of this engagement; the termination of it by the architect's final certificate; and sometimes, unfortunately, a dispute which is concluded by an arbitration or action at law, and the inevitable bill of costs. Unquestionably a great many disputes in regard to building contracts would be avoided if the legal position of the parties was constantly borne in mind, especially by the contractor and architect. In every contract which is properly drawn it is stipulated that extras shall be ordered in writing, and that they shall not be paid for unless this condition is complied with. Of course, as we all know, the final certificate of the architect can waive this condition, and consequently many builders are satisfied to execute extras under a verbal order, trusting to the important final certificate. If, however, from any cause whatever the architect refuses to sanction these illegal extras, as they may be called, by his final certificate, there is almost certain to be a dispute, and, perhaps, litigation. It is for this reason that Mr. Macey's work is of considerable value, because it is one which essentially appeals to the practical man. Shortly stated, it consists of conditions of contract, among which are interspersed legal and practical remarks with reference to a preliminary table of legal cases and general notes. This table is alphabetical in form, but it is somewhat larger than is necessary, since it appears to contain some cases which hardly fall within the scope of the work; for example, that of Lemmon *v.* Webb, in which it was decided that if the branches of trees from adjoining land overhang a man's property he can cut them off. Nor are the references to the Workmen's Compensation Act necessary.

There is also a tendency to state legal propositions too shortly; for example, when it is stated that no action lies against an arbitrator for negligence, the reader ought to know that it is because he is acting in a judicial capacity. Subject, however, to this criticism, the book is ably and ingeniously compiled. One could have wished that as regards the relations of the building owner and contractor the part relating to tender had come first. It falls, however, under Clause 4 of the contract. As it is, the following clause is printed:—"The contractor shall make his tender for carrying out the works by filling up the form of tender annexed at the end of specification, and such form is not to be detached, and no tender of the contractors will be considered other than on that form." We then turn to p. 194, where we find the form of tender, and in regard to this it is pointed out that a tender may be withdrawn any time before acceptance, and that the acceptance of a tender by a corporation must as a general rule be under seal. This necessity for having all contracts with corporations under seal is one of the most important points for a builder to bear in mind, since innumerable disputes have arisen from the want of this formality. We are surprised not to find some of the numerous cases which have been decided to this effect in the table of cases.

There is no more important point in regard to building contracts than that which concerns the taking out of quantities; and unquestionably an architect should, if possible, employ a surveyor for this purpose. There is no doubt that an architect has an implied authority to employ a surveyor to take out the quantities. It is equally clear, however, that an architect is not prohibited by law from taking out the quantities himself—this was a point decided in the case of Foreshaw *v.* Lord Waterpark, reported in the *Builder* on June 23, 1900, as well as in the more important case of Restell *v.* Nye, decided in the following year by a Divisional court, but in that case the judge pointed out that the employer should be informed that the architect himself is about to take out the quantities. "It is safer and wiser," says Mr. Macey, "for the architect, whether taking out the quantities himself, or when employing a quantity surveyor to do so, to inform the employer of his proposed action in the matter."

There are so many points in the sequence of events between the beginning and the end of a building contract that it would be impossible to do more than note one or two. Of these, whether from a legal or a practical point of view, none is of more importance than the date of completion of the work or the question of damages which result from its non-completion. This matter falls under No. 42 of Mr. Macey's conditions, but we think he would have done better in his

* "Conditions of Contract Relating to Building Works." By Frank W. Macey, Architect. Revised as to the strictly legal matter by B. T. Leverson, Barrister. London: Sweet & Maxwell, Ltd., and B. T. Batsford. 1902.

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precedent to have omitted the preliminary words as to the date of the commencement of the work. There may be plenty of good reasons why a contractor should postpone the commencement of the business, and it is the completion which is the essential point. Mr. Macey suggests the words "within twelve calendar months, or by a specific time from date of signing contract," but the great point is that the contractor shall from the very beginning have the exact day of the month by which the work is to be completed fixed in his mind. On this point the writer, we think, might have been more emphatic. He does not refer to the leading case of Jones *v.* St. John's College, Oxford, in which it was decided that if a contractor agrees to complete by a fixed date, and it is physically impossible for him to do so, not on account of any unforeseen circumstances, but in the ordinary course of events, he is still liable for damages for breach of contract. This is the decision which, above all others, should be present to a contractor's mind, since in the stress of competition he is always inclined to give himself too short a time, and, in some cases, to trust to luck that he will finish the work by the agreed date. Mr. Macey refers to the case of Dodd *v.* Churton, decided in 1897, which is a complement to the case already mentioned, in which it was decided that if extra work was ordered, and by it the contractor was prevented from completing the contract in the specified time, the penalty cannot be enforced if such extra work is not specifically agreed to be done by such date. The following paragraph Mr. Macey says is often embodied in the date of completion clause:—"It shall be distinctly understood that as time is an important element in the contract, time shall be of the essence of the contract." The more simply a contract is worded, however, the better, and the chief point under this particular head is simply to have a date inserted which shall give a reasonable time for the completion of the contract, and by which the contractor shall from the very beginning shall determine to abide.

An interesting practical point, upon which, no doubt, a good many of our readers hold different opinions, is in regard to the clerk of the works. "The employment," says Mr. Macey, "of a clerk of works is not always a satisfactory matter. The clerk of works occupies a very difficult position. Heretofore he has always been an educated man, and unless the architect has sufficient work to assure him a permanent appointment, he cannot always be depended upon. By far the better plan to adopt is for the employer to allow the architect some additional fee for extra superintendence. The architect can then arrange with one of his assistants, with whom he is always in touch, to give more attention to the superintendence of the work than would otherwise be afforded." Opinions are sure to differ upon this point, because so much depends upon the ability and integrity of the clerk of the works, and men are prone to decide upon the capacity of a class by the particular capacity of one or two individuals with whom they have been brought into contact. The question of the employment of a clerk of the works, and of the date of the completion of a contract, illustrate, however, the large number of important and suggestive points which a perusal of Mr. Macey's work raises.

HIGH-POWER GAS LAMPS AND THEIR COST.

FOR several years gas engineers have been endeavouring to devise an incandescent gas lamp suitable for the lighting of streets and industrial works, which will emit from one burner a light intensity equal to that of the 2,000 candle-power electric arc lamps, and at the same time be less costly. This task has not yet been fully accomplished, but during the last three years the success of the efforts made in this direction has been sufficient to induce the Corporation of London and the controlling authorities in many other towns to adopt, in many cases, the incandescent gas lamp in preference to electric arc lamps.

This success has been attained by the use of what is termed the "high pressure" system. In this country gas is supplied to consumers under a pressure of from 1 to 4 in. of water. For the high pressure system this pressure is increased by a water motor or other device to 10 or 12 in. before the gas passes to the incandescent burner. The effect of increasing the pressure of the gas passing into the burner is to increase the velocity of the stream of gas passing up into the mixing tube of the burner, and this increase in velocity causes an increase in the proportion of air drawn through the side air-holes of the burner, with the result that the flame temperature is increased and a more powerful light is emitted from the mantle. Instead of increasing the pressure of the gas, a similar result may be obtained by using the gas under the ordinary low pressure and sending a stream of compressed air into the mixing tube, as in the latest form of the Scott-Snell lamp.

The use of a special compressing apparatus for each lamp is somewhat costly, and should be quite unnecessary. The term "high pressure" applied to gas supplied under a pressure of 10 in. is somewhat misleading, for a 10-in. pressure is by no means a high pressure, and there is no reason why the gas companies should not be called upon to supply gas under this pressure. Every consumer can with ease reduce the pressure of the gas supplied to him to any desired point by means of an inexpensive governor, but the apparatus required to increase the pressure is more costly and occupies more space. The cost of supplying gas under a pressure of 10 in. from the gasworks would not approach that involved by the use of a separate compressing apparatus for each lamp, if high-pressure lamps came into general use.

In the United States, illuminating gas has for some years been distributed over large areas by Mr. F. H. Shelton under a pressure of 554 in. of water (20 lbs. per sq. in.) without increasing the loss by leakage and without perceptibly affecting the quality of the gas. It is true that the wrought-iron mains have to be of good quality and to be connected with great care, but it is quite time to adopt a higher standard of soundness for gas mains in British towns, and if American gas engineers can construct mains which remain gas-tight under 554-in. pressure, British gas engineers ought to be able to successfully accomplish distribution under a pressure of 10 in. The Mond Gas Company is about to distribute Mond gas in South Staffordshire under a pressure varying from 55 in. to 194 in. in the mains, and if Mond gas can be so distributed, there is little doubt that coal gas can be similarly treated. If, moreover, the supply of high-pressure gas necessitated the abandonment of all the cheap defective brackets and pendants now in use, and the introduction of gas-tight pipes and fittings, a notable achievement would have been effected.

With high-pressure gas it is not only possible to obtain more powerful lamps, but the intensity of light obtained per unit of gas consumed is also increased. The following table shows the average candle-power per cubic foot of gas consumed per hour obtained by the use of different descriptions of gas burners:—

	Per cubic foot of gas per hour.
Flat-flame burners	2·5 candles.
Argand burners	3.0 "
Regenerative burners	8.0 "
Ordinary incandescent burners	20 0 "
High-pressure incandescent burners	30.0 "

By supplying gas to the burner under a pressure of 10 in., a 300 candle-power light is obtained with a consumption of 10 cubic ft. of gas per hour. By increasing the pressure to 54 in., Mr. Onslow, of Woolwich, has found that the light may be increased to 450 candle-power, while the consumption is increased to 15 cubic ft. per hour. It has been claimed that as much as forty candles per cubic ft. of gas consumed per hour can be obtained, but the writer's experience indicates that thirty candles per cubic ft. is a fair average.

To enable the gas lamps to bear comparison with the electric arc lamps it is usual to place two or three of these high-power gas burners in each lantern, or in separate lanterns supported by one column. In Ludgate-circus, London, high-pressure gas lamps may be seen side by side with electric arc lamps, and the gas lamps appear to be quite as efficient as the electric lights. Here the gas lamps are usually maintained in good working order, and the result is very satisfactory; but on the Tower Bridge, London Bridge, Southwark Bridge, and Blackfriars Bridge the mantles are not always kept in proper repair, and it is usually possible to find on these otherwise admirably lighted bridges several prominent advertisements of an objectionable feature of incandescent gaslighting, *i.e.*, the necessity of giving the mantles constant attention. Although mantles of unusual strength are manufactured for high-pressure lighting, they are very liable to break or get out of position.

In a paper recently communicated by Mr. Nasmith to the Manchester Association of Engineers reference is made to the Report of Mr. Newbigging to the Manchester Corporation upon a trial made with thirty-five lamps supplied with gas compressed by the Keith apparatus. The cost of the apparatus, connexions, and pipes for installation of thirty-five burners was 155*l.* 0s. 2d., while for maintenance for 347 hours the installation, including 10 per cent. interest on capital, the cost was 18*l.* 9s. 2d., the latter sum being made up as follows:—

	£	s.	d.
Gas, 83,000 c. ft. at 2s. 6d. per 1,000	10	7	6
Water, 25,560 gals. at 4·85d. per 1,000	0	10	4
Mantles and rods (two mantles allowed for each burner)	4	7	7
Extra attendance and glazing	1	17	11
Interest for one month at 10 per cent.	1	5	10
	£18	9	2

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The relative cost of the various systems of lighting by gas is stated to be as follows :—

	Cost per hour of maintaining a light of 1,000 c.-p.
Flat flame burners	7·5d.
Ordinary low-pressure incandescent burners	1·96d.
High-pressure incandescent burners	1·77d.

Mr. A. W. Onslow, of Woolwich Arsenal, advocates the use of a much higher pressure than 10 in. In one of the Arsenal factories, in which 500 to 600 men are employed, and which is well filled with machinery of all descriptions, he has replaced 605 flat flames by 150 incandescent burners supplied with gas raised to a pressure of 54 in. by means of a rotary blower. The relative results obtained from the two forms of installation are stated to be as follows :—

	Number of burners.	Gas consumed per hour.	Total candle-power.	Total cost per hour.
		Cubic feet.	Candles	s. d.
Flat flame installation	605	4,235	7,437	8 6½
Incandescent installation	150	2,250	64,950	6 10½

The 6s. 10½d. quoted as the working cost of the incandescent installation includes the cost of mantles, renewals, power, and every incidental charge. It appears, therefore, that in this factory a saving of 1s. 8d. per hour in the cost of lighting has been effected, and at the same time the intensity of the light obtained has been increased to nearly nine times the original candle-power, by the substitution of high-power incandescent gas burners for ordinary flat flame burners.

It is probable that the conditions at Woolwich are more favourable for high pressure lighting than in many other factories, but it is evident that, where proper supervision can be given to the burners, the incandescent system of gas lighting may be successfully introduced into workshops in which machinery is employed, and will result in a diminution in the heat evolved, a less vitiated atmosphere, and an appreciable pecuniary economy.

NOTES.

Form of Building Contract. THE Eighteenth Annual Report of the Institute of Builders contains some remarks on the proposed form of conditions of contract which was accepted by the Council of the Institute of Architects, as the result of a joint committee of representatives of the two Institutes, and rejected (in our opinion rightly) by the General Meeting of the Institute of Architects, because it included the application of the arbitration clause during the progress of the works to the case of materials condemned by the architect as unfit. The demand that an architect is not to condemn materials supplied for his building without the builder having the power to call in a third person to (possibly) reverse the architect's decision, seems to us simply preposterous; it is putting the architect in a position absolutely inconsistent either with self-respect or with proper control over the building. The language of the Institute of Builders' Report is, we admit, moderate enough, and those who do not know the facts would hardly gather from it what important issues are involved in the difference between the Architects and the Builders on this point. Builders may know that there are some unreasonable architects; on the other hand, architects know that there are some dishonest builders, who require a very tight hand over them. The plain fact is, that while the architect used to be master on the building works, the builder wants to be master now.

The Ventilation of the Houses of Parliament. A FEW days ago there was a recurrence of the grumble which arises from time to time in the House of Commons in regard to the bad ventilation of the House and its accessory departments. It is difficult for those who are not in constant attendance in the House, as the representatives of general newspapers are, to realise how far these complaints are really justified; but we have a strong impression that some members would never be contented with anything, and that those who complain for the most part know little or nothing about the arrangements for ventilation. It is pretty obvious that Mr. Wylie, the member for Dumbartonshire, who brought forward the subject on the present occasion, does not, as he referred to ceiling gas-burners as the means of extract, whereas the extraction is performed by a fire at the bottom of a great up-cast shaft in the Victoria Tower, with a fan to aid it when necessary; at all events this was the arrangement when we went over the building with the clerk of works some years ago, with the express object of seeing the whole system; we have no reason to suppose that this system has been discontinued, and we can testify from observation that the extract current obtained by this means is a very strong one indeed. We quite agree that the system of admitting air through the floor matting is a bad one to begin with, and that it is time that a better system were introduced. But it would be well if members who bring forward resolutions as to the want of ventilation would make themselves properly acquainted with the facts before they make their complaints.

Electric Supply Bill. WE are glad that the Bill promoted by the various London Local Authorities to enable them to purchase electric supply undertakings has passed the second reading, as it is only right that they should have an opportunity of stating their case to a Committee of the House of Commons. It seems rather hard that because in London several electric companies have been empowered to supply in more than one area and to set up generating stations outside of London that therefore the Act authorising the compulsory purchase of these undertakings is inoperative. The Bill was the result of a conference between the London Corporation, the County Council, and the various Local Authorities. Its main provisions were, first, to enable Local Authorities to combine for purchase; secondly, to enable the London County Council with the consent of the Local Authorities to purchase; thirdly, to bring undertakings for the supply of electricity in bulk within the Purchase Acts; and fourthly, to enable the London County Council to supply electricity to local authorities. The London County Council, in promoting the Bill, merely wished to secure for London the rights enjoyed by other communities. Mr. Gerald Balfour, who spoke strongly against the Bill, said that the Government was fully alive to the fact that, sooner or later, the problem must be dealt with by legislation. In his opinion, the question could not be settled now by what he described as a premature and ill-considered private Bill. Mr. Bryce said that the Bill had been brought in by the London County Council at the request of the great majority of the local authorities interested, who point out that vested interests in electric lighting are being created in their districts every day. The longer legislation is delayed the more hopeless will it be to deal with the purchase question in the broad way suggested by the President of the Board of Trade.

Royal Commission on Sewage Disposal. THE Commissioners appointed in 1898 to inquire into the various methods of sewage-disposal and to report as to what methods may properly be adopted under different circumstances, have issued a bulky volume containing the evidence collected between June 22, 1898, and May 22, 1901. Among the witnesses whose evidence is here reproduced are government officials, doctors of medicine and of science, chemists, bacteriologists, engineers, solicitors, members of important municipal corporations, patentees, and others. The first and second witnesses were Mr. A. D. Adrian, C.B., Assistant Secretary of the Local Government Board, and Mr. A. Murray of the Local Government Board (Scotland). They were followed by many well-known experts, including Sir Edward Frankland, Sir Henry Roscoe, Dr. Rideal, Dr. Percy Frankland, Dr. Woodhead, Dr. Houston, Dr. Adeney, Colonel Ducat, the late Mr. W. Santo Crimp, Messrs. W. D. Scott Moncrieff, R. A. Tatton, Frank Scudder, Donald Cameron, W. J. Dibdin, Baldwin Latham, C. J. Whittaker, and others. The report contains also a record of visits to Manchester, Leeds, Ripon, and Accrington. The most striking feature of the volume is the large amount of space devoted to the bacterial treatment of sewage in tanks, contact-beds, and filters. Land treatment and chemical precipitation are not neglected, but the Commissioners have evidently determined to make a thorough examination of the most modern methods. That the evidence collected in this volume is in favour of bacteriolysis is proved by the interim Report, based on this evidence, and issued last year, in which the Commissioners said:—"We are satisfied that it is practicable to produce by artificial processes alone, either from sewage or from certain mixtures of sewage and trade refuse . . . . effluents which will not putrefy, which would be classed as good according to ordinary chemical standards, and which might be discharged into a stream without fear of creating a nuisance." We hope to consider the volume of evidence more thoroughly in an early issue.

Work at the National Physical Laboratory. WE were agreeably surprised last Wednesday to find that not only were the alterations which had to be done to Bushey House to fit it up as a laboratory practically complete, but that testing work had actually begun. Dr. Glazebrook and his able staff of assistants deserve every credit for the manner in which the testing-rooms have been fitted up. We noticed an electric furnace which enabled pyrometers to be tested up to 1,200 deg.

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Centigrade. The possibility that this opens to manufacturers of being able to measure accurately very high temperatures seems to us to be of great commercial importance. The quality of the work that Dr. Harker has already done in platinum thermometry is a guarantee of the high-class work that will be done in this department. The arrangements of the engineering laboratory are very complete, and accurate tests on pressure gauges, standard screws, &c., which would be quite out of the question in ordinary workshops, can be easily made in it. The electrical laboratory is fitted up with apparatus of the most approved type, and we were glad to see that Mr. Campbell had set up a Kelvin voltmeter with a mirror reflecting a spot of light on to a circular scale as a standard. It seems to us that this forms an almost perfect standard. He has also arranged apparatus for making both elaborate and simple tests on iron for permeability and hysteresis. We were glad to hear that later on Dr. Glazebrook intends to take up the vexed question of standards of light. This question has been causing considerable trouble amongst electricians. The pentane standard, which is the one most generally adopted in this country, needs to be used with the greatest care, and we have found that the marked candle-power of ordinary electric glow lamps is, as a rule, something very different from their real candle-power. The standardising of glow lamps at Bushey House would be a very great help in enabling manufacturers to rate their lamps properly.

Landlord and Tenant.

THE case of Foulger *v.* Arding (the *Times*, March 13, 1902) is of general interest to landlords and tenants, as it turns on a covenant now to be found in nearly all leases, and about which, in its varying forms, considerable litigation has taken place. The covenant occurred in a lease which contained no repairing covenant by either landlord or tenant, and was in the following terms:—The lessee covenants

"to pay and discharge all taxes rates including sewers main drainage assessments and impositions whatsoever which now are or at any time hereafter during the continuance of the said term hereby granted be taxed rated assessed charged or imposed upon or in respect of the said premises or any part thereof or on the landlord tenant or occupier of the same premises by authority of Parliament or otherwise howsoever (landlords' property tax and tithe only excepted)."

Under Section 4 of the Public Health (London) Act, 1891, a notice had been served on the landlord requiring him to abate a nuisance arising from a defective privy on the premises. The landlord carried out the work, but under the above covenant sued the tenant to recover the amount expended. It was admitted that but for the covenant this charge would be one to fall on the landlord. The Divisional Court found in favour of the tenant, but the Court of Appeal have now reversed this decision, holding the word "impositions" to cover this matter. It was urged on the Court that such a reading would include the case of a building erected beyond the building line and the consequent duty of pulling it down, but the Court met this argument by saying the covenant must be read as embracing only what the parties could reasonably be supposed to have contemplated as within its purview. Both the Court of Appeal and the Divisional Court considered the decided cases as expressing the law on this subject to be very unsatisfactory, and in the present decision the limitation expressed above seems unsatisfactory to us in construing an absolute covenant. The tendency is now to make tenants bear all burdens in respect of the property they lease; and from a consideration of the very numerous cases on the point it appears that, to accomplish this object, in framing this covenant care should be taken to observe three points:—1. To make the covenant indemnify the landlord both in respect of charges placed on the premises and obligations imposed on himself. If this is not done, certain duties imposed by Municipal Authorities as to roads and sewers, which form no part of the premises, may not fall within the covenant. 2. To use wide enough words in laying the burden on the tenant; for instance, a water rate has been held not "imposed" within the meaning of a covenant. 3. To use words wide enough to embrace all rates, duties, and statutory obligations; and for this purpose, as far as can be seen from the decisions, the following seem the most comprehensive words: "rates taxes assessments charges outgoings impositions duties and statutory obligations."

Lord Rayleigh's Lectures.

LORD RAYLEIGH gave his fifth lecture on "Some Electrical Developments" at the Royal Institution last Saturday. He pointed out that Hertz, whose early death was an almost irreparable loss to science, had completely demonstrated the truth of Maxwell's theory that light was an electrical phenomenon. The invention of the coherer by Branly enabled us to detect electric waves to great distances. He saw no reason for doubting Mr. Marconi's statement that he had sent wireless messages across the Atlantic. Owing to the curvature of the earth there must be a mountain of water about a hundred miles high above the straight line joining the sending and the receiving station. Since Hertzian waves travel in straight lines, and cannot pass through a conducting substance like sea-water, the signals in the ether must be bent round so as to keep on the earth's surface. It could not be a phenomenon of refraction, and it can only be due to diffraction. Taking the wave length of the Marconi waves to be a thousand feet, he calculated that the case was analogous to a luminous spot on a metal sphere one inch in diameter. As in this case the light waves do not appreciably follow the curvature of the ball, he concluded that the curvature of the earth was a very great drawback to wireless telegraphy. It would not do to try and get over this difficulty by making the wave length of the electric waves very long, as in this case they fail to get a hold on the ether, and only feeble signals would be sent. Experiments on electrical resonance were shown, and Lord Rayleigh stated some surprising results he had arrived at theoretically. If there was an alternating-current generating station in one town and a suitable circuit was placed in a neighbouring town, then theoretically it would be possible to obtain as much work from this secondary circuit as the station could give to the first circuit. This is true even when the mutual induction between the two circuits is almost zero. A striking experiment was shown illustrating Hertz's discovery that ultra-violet light considerably diminished the resistance of air to a spark discharge. Lord Rayleigh also showed that when light was concentrated by a quartz lens on a piece of zinc charged with negative electricity the charge was rapidly dissipated. Introducing a thin plate of glass in the path of the light effectively stopped this action, thus proving that it was due to the ultra-violet rays.

Licensing of Temporary Stands.

IN view of the approaching Coronation processions, the case of The Westminster Corporation *v.* The London County Council, which we reported some time since, should have consideration. The question there decided is, who is the proper authority to licence temporary stands or to inflict penalties for their erection without such licence, since the passing of the London Government Act, 1899, which divided the administrative County of London into separate boroughs. The point arose in connexion with the stands which were erected to view the funeral procession of the late Sovereign. Section 5 of this Act (in connexion with the schedule thereto), from a certain day, fixed by Order in Council as November 9, 1900, removed certain powers vested in the London County Council from that body to the Council of each borough. Among the powers so transferred was the power under Section 84 of the London Building Act, 1894, to license the setting up of wooden structures, and to take proceedings for default in obtaining or in observing the conditions of such licences. Under this Section the Council of the City of Westminster claimed to be the authority to license certain of these structures, whereas the County Council claimed they fell under Sections 82 and 83 of the Act, and that therefore the jurisdiction over them was not transferred. The Divisional Court, constituted of three Judges, has now held such powers in regard to temporary structures made of wood only (except so far as nails are used in the construction) to be transferred to the various Borough Councils. The Court, however, gave no decision on a further point which was raised, as to whether the supervision over these structures has to be exercised by the district surveyors, or whether such duties under the Act of 1894 still fall on the County Council surveyors.

Unsafe Balconies.

A CORRESPONDENT sends us a photograph of the house in Pembroke-square where, a few days ago, the iron balcony, on which several persons were standing, gave way, and the occupants of it fell into the area below. The stone sill, into which we presume the lower return rails of the balcony were fixed, appears to have broken right away across the whole front of the house, having been very likely cracked by the rusting of the iron. The accident raises serious considerations in regard to the probable danger from insecure balconies during the Coronation procession this year. Many of these iron balconies to ordinary dwelling-houses are probably quite insufficient to bear an unusual crowd of people; they have in many cases been badly fixed to begin with, and their condition perhaps has never been examined since they were fixed. Unless proper precautions are taken we shall be

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hearing of some lamentable accidents from the failure of such balconies on houses on the line of route of the procession, and on those in side streets which abut upon it. It is a question whether the District Surveyors ought not to have official instructions to examine balconies on the line of route.

Conway Castle.

IT is stated that Mr. Harold Hughes and Mr. Clarence White, jointly, will prepare designs for the proposed restoration of Queen Eleanor's Tower at Conway Castle. That tower and King Edward's Tower form two of the eight round towers, each with a slender turret or watch-tower, flanking the castle main wall, and guarded the grand entrance on the north-west side. Conway Castle was built in 1284 by Edward I., to command the pass from Penmaenmawr, and after the designs of, it is supposed, Henry de Elreton, "master-mason" of the contemporary castle at Carnarvon. It stands upon a tongue of rock at the south-east apex of the triangle formed by the walls, 1¼ mile in length, encompassing the town. The oblong plan, covering an area of 60 yards by 140 yards, comprises two courts, and an outwork at the remoter end by the river-side. The great hall, 130 ft. by 30 ft., is lighted with six narrow windows opening upon a creek from the Conway River, and three, of a later date, that look upon the ward. Of the eight massive arches which supported the roof, four have remained to our time. On the east side is a small entrance, well protected, and through the rock below are passed, for a distance of 50 ft., the chains of the suspension bridge constructed in 1822 6 by Telford, and on the same principle as that which he followed for the bridge across the Menai Straits. The Parliamentary forces under General Mytton captured the castle in 1646 from Dr. John Williams, Archbishop of York, who had garrisoned it for the King. After the Restoration it was granted to Edward, Earl of Conway, who dismantled the fortress and shipped all its movable materials for the repair of his seat in Ireland. The vessels, however, suffered shipwreck and their cargoes were lost.

The Church of St. Helen, Bishopsgate Within.

ON Friday, March 7, Dr. Tristram, K.C., agreed to grant a faculty of the Consistory Court of London authorising the rector and churchwardens of the united benefices of St. Helen, Bishopsgate, with St. Martin, Outwich, to carry out an improvement in a portion of the churchyard. The alteration will consist of the addition to the narrow roadway leading southwards out of Great St. Helen's of an enclosure on the south side of the church, in the angle of the nave and Holy Ghost Chapel. The enclosure has for some while past constituted a public nuisance in the opinion of the district sanitary inspector, being made a receptacle for all kinds of rubbish, besides forming an obstacle to the turning of vehicular traffic at that spot. The Corporation of London have undertaken to defray all the charges of the improvement, since a sum of only 3,000*l.* was appropriated for restoration and repairs of the fabric after the sale of the site and materials of the church of St. Martin Outwich, Threadneedle-street, and the union in 1873 of the two parishes. Half of that sum was expended ten years ago, when a total amount of 12,000*l.* was spent upon the restoration of the church and the laying-out of the churchyard under the late J. L. Pearson's superintendence. Pearson designed the reredos, and various contributions of money and in kind were made by the Merchant Tailors', Mercers', Grocers', Skinners', and other City companies and by private individuals. The dwarf wall and railings of the enclosure will be replaced with wrought-iron railings to protect the buttress and wall of the church near the south door, attributed to Inigo Jones, of which we published a measured drawing by Mr. J. G. P. Meaden, on August 20, 1898.

The Parish Church, Portsmouth.

WE hear that Mr. T. G. Jackson, R.A., has been called in to advise upon the structural condition of Portsmouth parish church, and to prepare a scheme for the rehabilitation of the fabric which is greatly decayed. The present cruciform church, originally founded in 1173-80 by Richard Toclive, Bishop of Winchester, consists of a Transitional chancel and transepts, a nave and aisles as rebuilt in 1691 in the debased style then in vogue, and a western tower surmounted with a cupola carrying a vane in the shape of a gilded ship, rising to 120 ft., which has formed a familiar landmark to many generations of seamen. The church has a capacity of 1,000 sittings, and contains a cenotaph of George Villiers, Duke of Buckingham and Lord High Admiral, whom Felton stabbed at the Spotted Dog, nearly opposite, in the High-street. The marriage of Charles II. and Katharine of Braganza is recorded in the register.

Institute of Painters in Water-Colours.

A CHANGE has been made in the interior arrangement of the rooms of the Institute of Water-colours, a considerable portion of the east room having been thrown into the centre room, the north part of the east room being partitioned off into a small square room. We do not see any advantage in the change for exhibition purposes; the long east room was a particularly good one for hanging pictures, and in place of it we now have a long room running east and west with the wall space broken in the centre by an ornamental column at each side, on the site of the original wall. Architecturally the suite of rooms would have a far better effect if the thing were done thoroughly and the west room also thrown into the centre room with decorative columns; we should then not have the awkward and unmeaning effect of columns projecting into a room in the centre of its long side; and as the alteration has been made so far we recommend that it should be completed. The best things in the present exhibition are not, for the most part, the large and prominent works, but the smaller landscapes and sea-pieces. Various examples of the latter class by Mr. John Reid are all admirable for colour, light, and movement. Mr. David Green's "Returning Fleet" (181) is also a good little sea-piece, and his "Marshlands" (257) and "Showery Weather" (304) equally good in another way, also "Back from the Fishing Grounds" (312). Several small landscapes by Mr. Weedon, especially "Stormy Weather near Sandwich" (474), keep up the traditions of the school of David Cox. Mr. John White's "Sidmouth" and "Branscombe Sea-weeders" (84, 92) are coast studies of special effects of light and colour. Among the larger landscapes those of Mr. Bernard Evans are all powerful in effect, in the rather loaded style which he has evolved for himself; "Across Stainbourn Moor" (292) has a good deal of the style and of the peculiar power also of de Köning. Among other landscapes may be mentioned Mr. Cotman's "Late afternoon—Approach to Canterbury" (20); Mr. Walter Fowler's "Sunny Days" (157); Mr. Orrock's "In Arundel Park" (161), the best of his exhibits; Mr. F. Walton's "Anagown, Loch Maree" (209); and Mr. Leslie Thomson's "A Tidal Creek, Isle of Wight" (232). Among figure-subjects—most of which are very commonplace—the most noteworthy is Mr. Byam Shaw's scene from the opening of "Henry VI.," where the messenger, a soldier in armour, comes in with the bad news from France; this is a fine and remarkable work. Mr. Henry Stock has confined himself on this occasion to portraits, among which the small portrait of "Lady Penrhyn" (188) is a work of great refinement and beauty of colour. Mr. Wetherbee gives us in "The Sleeping Shepherd" (195) a finely-composed idyll of the Golden Age. Among subjects into which architecture enters are Mr. Fulleylove's "Temple of Wingless Victory" (149); Mr. Harry Goodwin's "The Statue Spires of Milan" (250)—the architectural details of the foreground are rather hard and deficient in texture; Mr. Yeend King's street of "Chagford" (350); Mr. Bernard Evans's careful and powerful drawing of part of Fountains Abbey (455), and Mr. W. Collins's "In Bygone Days," in which he paints the buildings of a monastery with figures of monks, but forgets that in the days of the monks the buildings were comparatively new, not ancient and weather-worn. Painters of Mediæval buildings seem unable to realise that they were once new, fresh, and sharp in their mouldings and details, and not as we see them now.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held at No. 9, Conduit-street, Regent-street, W., on Monday evening, Mr. W. Emerson, the President, in the chair.

The minutes having been taken as read,

The Chairman said he regretted very much to have to announce the decease of Sir Richard Temple, one of their hon. members. Sir Richard Temple he had known for many years, and knew that he took the liveliest interest in art and architecture. Sir Richard was a very skilled draughtsman, and he (the Chairman) remembered many years ago in India, when they used to have occasional exhibitions, Sir Richard Temple's water-colour drawings were the admiration of all who saw them. Sir Richard was an exceedingly successful water-colour artist, and he also took considerable interest in architecture. He dined at one of their annual dinners some time ago, and immediately after joined the Institute as an Hon. Fellow. He was sure they all regretted very much to hear of Sir Richard's decease.

Mr. Graham said he had also to announce the decease of Mr. Geo. F. Judge, Fellow of the Institute, who was a constant attendant for many years at their meetings, and was well known to many present. He had further to announce the death of Mr. W. G. Doolin, of Dublin, Fellow, elected 1899.

The Late Mr. Bentley and the Royal Gold Medal.

The Chairman said he had at the last meeting a painful incident to mention in connexion with the death of Mr. Bentley, who, had he lived, would have been elected the Gold Medallist. As his decease happened before he was elected, the Council felt that they could not proceed to give the gold medal to the members of the family in consideration of his services, without reference to the King—for it was the

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King's gift. Accordingly they wrote to his Majesty, and, in reply, a letter had been received from Sir Dighton Probyn who said that the proposal had received his Majesty's careful consideration, but that his Majesty, while fully appreciating the kindly feelings which had prompted the Council of the Institute to make the suggestion, was of opinion that unless the Council were in any way pledged to award the medal as proposed, or unless it could be shown that a case similar in character had occurred before, it would create a dangerous precedent if the medal for the current year were given to the family of the late Mr. Bentley on the ground that in virtue of that gentleman's great services to architecture, the Council would have recommended him for the medal had he lived until the date of their next meeting. Therefore, that settled the question, much as they would have liked to have honoured Mr. Bentley. The Council at their next meeting, would take into consideration the names of other gentlemen and nominate some one else for the gold medal for this year.

The Planning of some Recent Library Buildings in the United States.

Mr. Sidney K. Greenslade then read a paper on "The Planning of some Recent Library Buildings in the United States," of which the following is an abstract :—

In his opening remarks the author said that the development of the library movement in America during the last ten years had been so enormous that few buildings erected previous to 1885 would be found to-day suitable for modern requirements. The librarians themselves have settled points in the policy of the working of libraries which previously were undetermined, and it was the very active interest of these men which had so greatly assisted the architects to produce such very fine plans. Mr. Carnegie's generosity had helped forward the movement wonderfully. Last year alone he gave more than 2,500,000*l.* for new buildings. The result was that the American architect had unequalled opportunities, and was showing the greatest interest in his work. At present some of the recent plans seemed as perfect as possible, yet the interest in the subject was so great that new developments were sure to take place.

The author went on to treat of various representative libraries under the following heads : (1) Reference Libraries ; (2) University Libraries ; (3) Town Libraries (in three divisions) ; (4) Branch Libraries ; (5) Small Libraries. The planning and general arrangements of the buildings, stack-rooms, furniture, &c., were described in every detail, and illustrated by plans shown by the lantern.

In the first group was placed the Library of Congress at Washington, by far the largest library building in the States, being 470 ft. long by 340 ft. wide, with four great inner courts. The site was acquired in April, 1886, and Messrs. Smithcyer & Pelz's plans were adopted, but no limit of cost was fixed. By the summer of 1888, Congress, dissatisfied with progress made, lodged the entire control of the work, including preparation of new plans, in the hands of General Casey, Chief of Engineers of the United States Army. In March, 1889, Congress enacted that the building should be erected at a total cost of 1,300,000*l.*, including previous expenditure, according to a plan prepared by General Casey. The plan was based on that originally adopted, and the building, under the new conditions, was at once commenced, and finally completed in 1897.

The design for the New York Public Library, now being erected, is the result of two competitions held in 1896 and 1897. In the limited second competition twelve firms of architects were selected from those competing in the preliminary open competition, out of a total of eighty-eight. Tentative sketches of the plans of each floor were issued with the instructions. The assessors (with those elected by the competing architects) Professor Ware, of Columbia University ; Dr. Billings, the Librarian ; and Mr. Bernard R. Green, of the Congressional Library finally selected a design which practically adopted the whole of these suggestions. The site allows of an isolated building with ample space for future extension, 455 ft. frontage and 482 ft. to the sides. The cost was not to exceed 340,000*l.* without fittings, but it is estimated now to come to 600,000*l.* Before describing the plan in detail, Mr. Greenslade referred to some interesting and noteworthy points in the conditions of competition. The library will have shelving capacity for 2,000,000 volumes, and seems nearly as perfect a library as possible. Messrs. Carrere & Hastings, of New York, are the architects.

The State Historical Library building at Madison, Wis., is an extremely well-planned building, and forms an ideal reference library. It is to house 675,000 volumes. Architects, Messrs. Ferry & Clas, Milwaukee.

Of University libraries, those of Columbia and New York are particularly worthy of attention. They are not unlike in plan, both in general outline taking the form of a Greek cross. The great central reading-room—in one case octagonal and in the other circular—is the motive of the design in both buildings. Special study-rooms, with their books stacked around them, or near them, are an important feature of both libraries, and in each are treated in a different way. The Columbia University Library is, perhaps, the most monumental of those yet erected in the States. Its magnificent domed reading-room, placed at the intersection of the arms of the cross, is octagonal in form, the four sides at the angles being shorter than the others, and the whole is covered by a great dome. The lighting is from four very large segmental windows following the lines of the main arches to the sides. Architecturally the building is very fine, but it is evident that to obtain it utilitarian points have been somewhat sacrificed. This applies particularly to the storage of books, and the difficulty the staff has in handling them. Its total shelving capacity is 1,050,000 books ; the cost was 240,000*l.* ; architects, Messrs. McKim, Meade, & White, of New York.

The library of the University of New York (also by Messrs. McKim, Meade, & White), though much smaller than the Columbia University Library, is in some ways more compact in plan. Its domed reading-room is circular on plan, and the books are stacked round about it and not below, and are generally more accessible. Its present shelving capacity is for 250,000 volumes. Shelf-room for 1,000,000 volumes altogether could be obtained by using the large auditorium below the reading-room for stacks.

The library of the Law School at the University of Pennsylvania — a remarkably well arranged and convenient plan — was also described. The architects were Messrs. Cope & Stewardson, of Philadelphia.

Town libraries the author dealt with in three divisions — under Division I. Large Town Libraries, being grouped the Boston Library, Newark Public Library, Providence Public Library, and Washington Public Library. In each of these buildings the motive of the design has been a different one. They all, however, evidence the growth of the free access policy and its great effect upon the plan. Not only is it necessary for the general reading room to have, as in the Bates Hall at Boston, the walls shelved for books of reference, but the borrower must also be allowed shelves to select from. The excellent plan is adopted at Newark of placing open shelf-rooms on either side of the delivery hall, where thousands of books may be stacked. At Providence the shelves are placed between the entrance hall and the delivery space—not so good a method ; still, the floor area at this point is so ample that the whole could be re-arranged with advantage. In Newark the stock-rooms are nearly isolated—a great advantage should fire occur in the main building.

The Boston Library (Messrs. McKim, Meade, and White, architects), one of the first great monumental libraries (begun in 1888), was opened in 1895. Architecturally of very high merit, its plan is not good from the librarian's point of view, but the librarians now know pretty well what is wanted, whereas fifteen years ago they were doubtful and uncertain. It is, therefore, unfair to criticise the plan of the Boston Library too hardly, because of the rapid developments since its creation. Still, there are many points in it that are not good, particularly the position of the fine reference reading-room in relation to the stack-room, the cramped position of the delivery hall, and the unfortunate shape and position of the stack-room necessitating the use of carriers. The building cost 473,000*l.* ; its present shelving capacity is for 750,000 volumes.

The Public Library at Newark (designed by Messrs. Rankin and Kellogg, Philadelphia) was only completed and opened in March, 1901. It is evident that a deal of thought has been spent in its arrangement and planning. A great point has been made of "free access" to the books, both outside and inside the stack. There are some excellent points in the planning of the building. The arrangements for the openshelf rooms, delivery hall, work delivery space, and stack-rooms are very good indeed, and the approach to these rooms from the main entrance is very direct. The cost of the building was 60,000*l.*

The Public Library building, Providence (designed by Messrs. Stone, Carpenter, & Wilson) was completed and opened in March, 1900. The Boston Library, as already stated, from the librarian's point of view, was hardly a success. In the planning of the Providence Library the librarian's advice was invited in the attempt to solve a problem which had not been altogether successfully coped with. An interesting plan resulted. A serious attempt has been made to meet the new requirements of the "free access" policy, and to a large extent it has been successful. The cost of the building was about 53,000*l.*, and the shelving capacity is for 225,000 volumes.

The design for the Washington Public Library building was the result of an open competition. Ten well-known library architects were invited to compete, each receiving an honoratium of 50*l.* Other architects were also allowed to send in schemes, and the result was that the plans of Messrs. Ackerman & Ross, of New York, were selected (not an invited firm). The cost was limited to 50,000*l.*, but this was overstepped considerably, the total estimated cost being 70,000*l.* Building operations were commenced in August, 1900.

At least two distinct types of town libraries occur in the libraries illustrated in Division II. The Atlanta and Davenport represent one and the Pawtucket the other. The latter has only a basement and first floor ; the others have an additional floor. At Atlanta the plan is more compact, and therefore more easily worked as a library than the rather monumental plan at Pawtucket. The open-shelf rooms adjoining the stack-room and either side of the delivery space are an excellent feature in the Atlanta library. The Utica library has not been erected yet. It seems to come midway between the above types. All the important rooms are placed on the first floor. Among points worthy of note are the position of reference spaces (10 ft. wide) on each floor of the stack-room ; the important position of the children's-room, which balances the general reading-room ; and the provision for special study-rooms. Libraries of this size—average cost, 20,000*l.* to 50,000*l.*—are becoming very numerous, and new developments in their planning will always be taking place.

Detailed descriptions were given by Mr. Greenslade of the following town libraries in Division II. :—The Carnegie Library, Atlanta, Georgia (architects, Messrs. Ackerman & Ross, New York) ; the Carnegie Library, Davenport, Iowa (architect, Mr. W. A. C. Jackson, New York) ; the Pawtucket Library (architects, Messrs. Crane, Goodhue, & Fergusson, Boston) ; and the Public Library, Fall River, Mass. (architects, Messrs. Crane, Wentworth, & Goodhue, Boston).

The author next discussed the third division of town libraries. The effect of the "free access" policy is well illustrated in the three libraries selected as examples, viz., the Carnegie Library, East Orange (architects, Messrs. Jardyne, Kent, & Jardyne, New York) ; the library at Duluth, Min. (architect, Mr. A. Rudolf) ; and the Public Library, Tacoma, Washington. The tendency to do away with walls and substitute columns with glazed screens between is a failure in all of them. In the East Orange and the Tacoma libraries the use of the radiating stack, the advantages of which were pointed out by the author, is new for a large building.

The system of branch libraries and stations is remarkably organised in many of the large towns. At present few towns have started with a series of new buildings. Old buildings have generally been converted, such as schools, churches, private residences, and shops. The branch library is therefore likely to develop greatly in the near future. It will be most interesting to watch the work of the advisory board of architects appointed to design the sixty-five new branch libraries of New York. Mr. Andrew Carnegie has given 1,000,000*l.* to build these branches, and the Board of Library Trustees have just appointed three firms—viz., Messrs. McKim, Meade, & White, Messrs. Carrère & Hastings, and Messrs. Babb, Cook,

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& Willard—to take the entire charge of the designing and supervising of these buildings. These firms will confer and collaborate in the work.

Up to the present time the planning of the branch library has been studied, perhaps, in Pittsburg more successfully than in any other town in America. There are five branches already erected of the seven presented by Mr. Carnegie, each on an isolated site (architects, Messrs. Alden & Harlow). Details were given of the Lawrenceville Branch, opened May, 1898; the West-end Branch, opened January, 1899; the Wylie Avenue Branch, opened June, 1899; the Mount Washington Branch; and the Hazelwood Branch. It is interesting to note the gradual development of the plans. The growth of what may be called the "turnstile control," resulting in the abandonment of the entrances to the reading-rooms from the delivery hall, as adopted on the first plan, is important. The apparent unfitness of the low railing separating the reading-room from the delivery hall, as adopted in the West-end branch, and substituted afterwards by screens in the later plans, is also worthy of note. Although the radial-stack plan is costly to build, yet the advantages where a "free access" policy is adopted are very great.

Finally Mr. Greenslade touched upon small libraries. The requirements of these have been particularly well studied in the State of Massachusetts. Hardly a village or hamlet is without one. Many of those around Boston are extremely successful. It was here that H. H. Richardson erected several of his well-known libraries, such as the Ames Library, at Easton, and those at Woburn and Quincy. The great feature of the plan he generally adopted is the alcoved main reading-room, and in these alcoves all the books were shelved. This method has not been found wholly successful from the readers' point of view, although architecturally the general effect of the alcoves is good.

Many of the recently-erected libraries of this class have very simple and compact plans. The author selected for description the little library at Wayland, Mass. (architects, Messrs. Cabott, Everett, & Mead, Boston); the Russell Library, Plymouth, Mass., by the same architects; and the library at Weston, extremely convenient and well-arranged for its purpose (architect, Mr. Jenny, Boston).

Besides the lantern views, the paper was illustrated by a large number of the original plans and photographs of the most recent library buildings in the United States.

Professor Beresford Pite said he would like to have the opportunity of proposing a vote of thanks to Mr. Greenslade for the extensive material he had put before them that night, and he thought that in moving the vote of thanks a considerable amount of congratulation was due to the Institute and the Council and the President for the selection of Mr. Greenslade to the Godwin Bursary, because that night they were reaping the benefits of the visit to America which Mr. Greenslade was enabled to take as the holder of that bursary. He thought the material which Mr. Greenslade had brought them was undoubtedly a historical record as well as an illustration of what had actually been done in the matter of the Library movement in the United States. It was something more than a justification as to the use to which that bursary was put, and he could imagine no subject the treatment of which would have given more pleasure to the founder of that bursary than the one which Mr. Greenslade had treated, and the way in which he had read up the subject, taken the tour, and brought back such a variety of useful information connected with what was essentially modern architecture. The object in view was not so much the study of ancient buildings as the study of modern architecture. They were accustomed to study architecture in temples and churches, to get back to the past, and to get from archæology almost all the art to be seen even in the matter of planning. But when they came to books and libraries they found themselves in a progressive atmosphere and in a new field. The enormous originality on this subject, and the extraordinary ingenuity, were qualities with which they always credited their Yankee brethren—the extraordinary ingenuity they displayed in creating buildings for a want which could hardly exist, and for bestowing not only architectural skill and engineering on the buildings, but providing modern appliances for books which do exist and for books which do not exist, and in building for the future in a most original way. This seemed to him most characteristic and remarkable. He would be very glad to hear from Mr. Greenslade whether those bookshelves which were to accommodate millions of books were yet in use—he meant as far as accommodating books went. They would be interested also to have some observations as to the practical use of the very large children's rooms, as well as on the large number of private reading-rooms and students' rooms, which seemed exceedingly numerous. Studying English libraries for the development of public libraries in England, they came across national characteristics and peculiarities which in many respects strongly differed from the things they found in America. He supposed the American was socially more highly organised than the Englishman. For instance, the accommodation provided for the toilet and lavatories, and so forth, which at home had been done away with as they were found to be a public nuisance, seemed to be a matter of great necessity in America. There evidently seemed to be no fear of the library being used for the passing purpose of a conversation or club room, or anything of that sort. There was an atmosphere of serious study about the whole planning and arrangement of the scheme which was very important. He would like to suggest when they were able to see the plans together, ranging from the greatest one to the smallest, that it would be very instructive in itself, apart from the paper, for the dimensions and accommodation and descriptions, as a general survey of the system of planning would be of very great importance and interest. He would like to say that personally he felt they had done a good thing in granting the bursary to a student who had gained honours as an artistic draftsman, and whose work as a designer they all enjoyed, and he had no doubt but that Mr. Greenslade's contribution would be of permanent importance to the Institute. He had much pleasure in moving a vote of thanks to Mr. Greenslade.

Mr. J. H. Quinn, Librarian, Chelsea Library, said he did not know that he could offer anything which would be useful from an architectural point of view on this subject, but as a librarian there was one thing which struck him very much, which was the extreme practicability of the planning, and how everything seemed to lie subservient to economy of administration and to meet the convenience of the public. That was a very important point in library planning, and probably in England it was more important than in America, because in America they did not seem to suffer, as in England, from the meagre funds provided by the public for libraries. In England the want of funds affected them even at the outset in the design of the library. Most libraries were very much cut down in the design and planning by committees, after the original design had been prepared, owing to this question of funds. That did not seem to be the case in many of the examples they had seen that night upon the screen. The Boston library could hardly be regarded as a town library. He thought it would rather be considered a National library, and with some of the other examples they had had it would seem they were State libraries and not town libraries. He was rather struck with one remark made by the lecturer, which was that all the important rooms were put on the first floor, and they would probably like to know why the important rooms were put on the first floor. It was a curious thing that here and in America the loafer would not take the trouble to go up to the first floor and, therefore, libraries were in that way rid of strangers and loafers, and so the rooms were devoted to serious study. Even if they had a reading-room on the first floor the tramp would not take the trouble to climb, and for this reason, and also because of the quietness which was essential for students, they placed these rooms above. He might, as an illustration, give a practical example of how public libraries in England were affected owing to the limit of the rate. In Chelsea, Mr. Brydon planned a very beautiful building—one which, if carried out in its original design, would have been of immense benefit to them, but owing to the want of more money—he believed about 1,000*l*—they were compelled to cut it down in a way they should not have done. Recently they had missed the late Mr. Brydon very much, but he was glad to say they had had Mr. Leonard Stokes to complete the design as originally prepared. Well, the cost was only some 1,200*l*., but the finding of a small sum like that in a rich borough like Chelsea was a great tax upon the 1d. rate, and such a small sum like that had to be borrowed. He had listened to the paper with much pleasure and expressed his own thanks to Mr. Greenslade, not as an architect, but as a librarian.

Mr. J. O. Smith said he had much pleasure in supporting the vote of thanks. He had very much enjoyed listening to the paper, and thought they all owed a debt of gratitude to Mr. Greenslade for bringing those novel plans before them in the very clear form he had. What struck one in seeing the first large plan on the screen was how the new country had come to the old country for ideas in planning in this new subject. It was new in America, but it was not new in England. It was evident the reading-rooms in the larger libraries shown were based entirely on the British Museum reading-room. With regard to the stack arrangement, the nucleus, at any rate, could be traced to the British Museum. As to the arrangement of the stacks, he gathered from Mr. Greenslade that the borrowers were enabled to come up to them and examine the books on the shelves. It seemed to him that many of the stacks, if they were correctly shown on the plans, would scarcely admit of that, from the fact that there would not be light enough. He gathered that they were 7 ft. high and covered with marble floors through which no light passed, and if they were 30 ft. distant from the windows, he did not see how it was possible for any person to read the books. In London they arranged them so that the books on the stacks could be read. He knew a library not far from where they were sitting where books could be read 30 ft. below the top of the upper tier of the book-stack; but that was top lighted only, and all the passages were gratings through which the light passed. He supposed in the case of some of the libraries they had seen where they were top lighted they also had gratings. Perhaps Mr. Greenslade could tell them about that. It was extremely interesting to note the clever way in which some of the smaller libraries were arranged with a view to getting the maximum of supervision. He thought the circular radiating stacks of books at the back of the librarian's counter were remarkably well arranged for the small libraries. On the whole, it seemed to him that the plans as they became simpler became better. He saw what appeared to him to be many grave defects in some of the larger plans, and he would very much like to see the buildings themselves. He would like to know if Mr. Greenslade could tell them whether artificial light was relied upon to light some of the larger buildings, and also how they are warmed. He supposed being in America they were warmed by steam, and he would like to know the effect upon the books. He had much pleasure in supporting the vote of thanks.

The Chairman said that in putting the vote of thanks he would like to add his expression of congratulation to Mr. Greenslade for the very able way in which he had treated the subject and the amount of work he seemed to have got through during his three months' visit in America. Those buildings were a long distance apart, and Mr. Greenslade was there in the hot weather and must have exerted himself to gain all this information in a temperature from 100 to 106 deg. With regard to Professor Pite's remarks and the casting of a sort of suggestion of doubt as to the exisitence of readers of these libraries, and the storage room for books which did not exist, he would like to say that, whether the readers were there or not, it only seemed to him to prove that this library movement was part and parcel of the great movement the Americans were making in view of the great necessity there was for increased instruction. Some time ago in the papers they would remember there was a correspondence in connexion with the comparative education in Germany, America, and England, and it was pointed out that the Americans and Germans were cutting England out in many trades and businesses simply owing to superior education. He imagined the Americans saw the necessity of this higher education, which was the reason for their working on these lines and starting those libraries, and whether those libraries were full or were not full now, they could depend upon it that before long they would

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be full. He should imagine that there were a great many books in these libraries and a great many readers.

The vote of thanks having been agreed to,

Mr. Greenslade said he was afraid that in summing up the paper he had left out some important points. It was very difficult with such a lot of matter to select from to mention all the points of interest, but the paper was to be fully printed in the *Journal*. He could assure Professor Pite that these libraries were used and the stacks were filled with books. [Professor Pite: What books, English?] Mr. Greenslade said he spent many evenings in the Boston Library in the Art Gallery section, and one seemed to be able to get any book one liked. There appeared to be a most remarkable selection, and there were dozens of people using them. At Washington, again, he saw sets of etchings and engravings, and in the Congressional Library there was a whole collection of engravings of Turner's sketches, published between 1830 and 1840. In all the libraries the stacks seemed to be full of the latest books from England, in the way of art books and architectural books. They were displayed on the shelves and one did not trouble the assistant at all. One simply took the book down and looked at it and left it. With regard to the children's rooms, they were simply crowded. The Branch Library at Boston was formerly a chapel, and the whole of the gallery was used for the children's library, and there were hundreds of children there in the evening preparing their lessons. The library provided a series of books, which were used at the various schools in the district, for them to study. In nearly all the libraries there were certain classrooms set apart where teachers brought their scholars, and the librarian placed certain books on certain subjects for reading in those rooms for the children. With regard to Mr. Smith's question as to the light, nearly all the stacks were wonderfully lighted. Of course, in the majority of cases glass was used for the flooring. The pierced cast-iron floor was not used very often, as the dust came through, and librarians did not like it. The Congressional Library was 45 ft. across, and it was quite light.

Mr. Smith: I can understand if glass is used, but I understood you to say it was only marble.

Mr. Greenslade said it was only marble at this library, but it was top-lighted as well. With regard to the heating, that was a large question, but he had touched on that subject in his paper in connexion with the Congressional Library, although he omitted to read it in the course of his address. He thanked them very much for the vote of thanks.

The Chairman announced that the next meeting would be on Monday, April 7, when there would be an election of members, and a paper on "Inlay and Marquetry," by Messrs. W. Aumonier and Heywood Sumner.

ARTISTIC ELECTRIC ILLUMINATION.

ON Thursday last week, under the auspices of the Society for the Encouragement of the Fine Arts, Mr. Edwin O. Sachs delivered a lecture on "Artistic Electric Illumination," in the galleries of the Royal Society of British Artists. Colonel F. C. Keyser, C.B., chairman of the Council, presided.

Mr. Sachs said the subject he was to talk on was one eminently appropriate at a time when many people were thinking of showing their loyalty at the approaching Coronation festival by illuminating their private residences and business establishments. That was the first time any one had spoken on the decorative side of illuminations, although during his visits abroad he had for many years seen what could be done in the way of artistic illuminations on a large scale, and wondered why no English artist had taken up the subject seriously. He approached the subject first as an architect; secondly as one who had travelled; and thirdly as one who believed that there was a means of employing electricity in an artistic manner for the purpose of decorative illuminations in place of the ugly gas flares. As an architect he looked upon electric illumination as a simple and effective method of outlining public buildings. As a traveller he knew every European capital and many of the minor towns, and, with a few memorable exceptions—notably the Glasgow Exhibition of last year—we were far behind the rest of the world in our attempts at public illuminations. He believed, however, that by the new E. L. B. system of electric lighting, in which he was interested, the difficulties that had hitherto existed of using electricity for illuminations were at last surmounted. The whole question of public illumination was one of very long standing, and any one acquainted with history would know how the great Roman Emperors, and before them the Greeks, and before them the Egyptians, on occasions of great rejoicing, would at night arrange displays of artificial lighting. The application of many small lights at night had from time immemorial been a means of expressing joy. In Russia illuminations had always been much favoured during the last three centuries, and any one coming across old prints would find illustrations showing what was done at the time. First of all there was a small earthenware pan filled with tallow and a wick, and that was the form of illumination that was used for a considerable period. Then came the candle illuminations, which were popular for many, many years. Then came various forms of small lanterns, made of metal, and innumerable paper appliances, called Chinese lanterns. They were quite unsuitable for gas, but were used with considerable effect as a covering for electric light. In Italy water played an important part in illumination appliances, being very often coloured. Another form of illumination appliance, originally intended to be used for oil, was a transparency, the light being placed behind. The most wonderful effect that he had ever seen produced by the application of candles was the celebration of the eightieth birthday of the Emperor William I. at Berlin, where, by special arrangement, the entire city of Berlin placed six or eight candles on the lower sill of every window. He considered that that simple but well organised effect was probably the grandest illumination that had been produced for many a year. But what would have been the effect if, instead of candles, they had used lines of small incandescent electric lights, running along the corners and fronts of the houses, or perhaps three or four rows! He should say that probably that would be the grandest form of illumination that could be given to any city. Reverting to gas, they had first of all plain pieces of gas-piping, with little holes bored at intervals. That was largely used for the outlining of buildings, and was very effective, especially if simple designs were adhered to. So long as one kept to plain devices a good effect might be obtained, but it must only be used for the very simplest form of illumination. The next form of gas outlining was a development by the application of a small burner, which did not, however, to any great extent improve matters. The next stage was the application of a small gas globe above the burner, the glass globe frequently being coloured. By that means gas could be made an effective illuminant as long as only plain, straight work was required, but immediately decorative devices were used he did not consider the results good; in fact, they were most tawdry. Lastly, as far as gas was concerned, came the very popular application of ordinary gas-jets behind crystal emblems, and under certain conditions the result might be made highly artistic, but the moment simplicity was left for complicated design they got bad results.

The lecturer then described the illuminations which he saw on the night of the King's birthday in the main thoroughfares of the West End, and said that for the most part he found most of the principal buildings were in darkness with the exception of a few "E. R.'s," stars and badges. Gas was the principal illuminant; in fact, he only came across four or five electrical devices, and those of rather an insignificant kind. He very much doubted whether the coming Coronation would give us any systematic attempt in the way of public illumination. The only street in London that went in for doing the thing on a systematic arrangement was St. James's-street, and he was afraid that even there they were rather apt to go in for the tawdry. On looking into the question he had found that the people of London were rather conservative and did not like to leave gas for the electric light, and secondly, the electric light companies in London did not quite seem to have grasped the possibilities by which they could make money by inducing their customers to illuminate by electricity instead of gas. There was a certain amount of prejudice against electric light for illumination devices, and that, perhaps, accounted for its being such a rarity on occasions of that kind, although one could get a far better effect from it than from anything else. It must be remembered that the illuminations on the King's birthday were trivial in the extreme to the illuminations one would find in connexion with a similar event in a foreign country or even in our own colonies, where electric light had already been used with very great effect. Their friends in Scotland at the Glasgow Exhibition showed what splendid results could be obtained from the use of electricity in outlining some of the buildings, and when the Duke and Duchess of York visited Australia and Canada, both countries did a good deal in the way of electrical illuminations, particularly Canada, which had probably learned a lesson from the United States, and nearly all the great public buildings of Canada were outlined with electric lights on that occasion. The great difficulty, of course, in outlining buildings with electric light in London was the question of cost and the necessity that had hitherto existed of having to adhere to straight lines. The British workman was a very expensive individual, and more particularly so when he called himself a mechanic and an electric wireman. That difficulty, however, had been got over by the new E.L.B. system, which allowed of practically every householder doing his own electric wiring, and he could move the lights about at will. A further advantage of the new system was that one was not confined to straight lines. They could have curves for encircling columns, they could festoon or form garlands—in fact, any form of device could be arranged at a moment's notice. The lecturer before concluding remarked that no matter how artistic the illumination might be, it was often spoiled, because ugly flaring colours were used as a background, and he dwelt upon the importance which a proper coloured background had in producing a really artistic effect.

On the proposition of Mr. Henry Hewkley, seconded by Mr. Philip H. Newman, Hon. Sec. and Treasurer, a cordial vote of thanks was accorded Mr. Sachs for his lecture.

CARPENTERS' HALL LECTURES:

EXETER CATHEDRAL.

ON Thursday, last week, Professor T. Roger Smith delivered the fourth of the course of lectures on matters connected with building, arranged by the Worshipful Company of Carpenters, at Carpenters' Hall, his subject being "Exeter Cathedral."

Professor Roger Smith said the ancient Devonshire church buildings had their most marked distinction in their rich carving. It was a county where ornament was to be found in profusion in the parish church as well as on the hill side, and it was therefore only consistent that the Cathedral of Devon should be erected in a style which more than any other demanded, nay, required enrichment. Exeter Cathedral was not one of the three or four cathedrals whose admirers could strive for the honour of its being reckoned the first in England, but it was not necessary to limit themselves to a first-class cathedral in their search for architectural beauty and features of interest. A Saxon church stood at Exeter in the seventh century, and occupied some part of the site of the present cathedral, but it had been superseded by more modern buildings, and had left no trace that can be recognised. The commencement of the oldest part of the present structure dates from the year 1111, and belongs to a complete Norman church begun at that date, and so far as they knew carried on during the whole twelfth century. The erection of this great church was part of the policy of the Conqueror and his successors, whose aim seems to have been to erect castles, churches, and cathedrals all over the land. The only portions of the old Norman church now remaining are two low massive towers. Everything else has been either modernised according to the idea prevalent in the fourteenth century or pulled down and rebuilt at that time and later. With the exception of the two towers the cathedral belongs entirely to the decorated or the fourteenth century period. Parts of it were done early in the century and parts later on, but there is a great degree of harmony from end to end. In its window tracery, its carving, and its vaulting—three of the matters which are most ornamental—Exeter is almost unrivalled. Its architects have relieved what

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would otherwise be but a dull exterior by a finely imagined series of statues in niches at the west front, and if the execution is a little rude there is no doubt that the general effect is one of richness. Exeter Cathedral is, however, far finer inside than out—a peculiarity of which no wise critic will complain. It was infinitely better that the expectations raised by the exterior should be surpassed by the interior, than that it should disappoint them. The cathedral was built in the style current in the fourteenth century, which was hardly illustrated at all by the Westminster Cathedral, and while, on the one hand, it was deficient in specimens of Early English, which is dominant at Westminster, and of Perpendicular, which is the style of Henry VII.'s Chapel, on the other hand, it retains two fine pieces of Norman architecture of which there are only traces at Westminster. Again, in proportions the two interiors differ. Those at Westminster are lofty to an unusual degree, and the actual height is very great. The proportions of Exeter are comparatively low and the actual height moderate. Moreover, this lowness of proportion extends to most of the windows, arches, &c., and results in a great deal of harmony and dignity. In one respect Exeter differs from almost every cathedral. It has no central tower, but in exchange it has two towers at its sides standing about midway between the east and the west ends. As a result there is outside a long level main roof with no break in it, which if it be dignified is also dull. Inside, the towers not only form transepts, but they affect the interior in another way—they render unnecessary the great piers which are usually seen at the crossing and upon which the central tower rests, and the absence of these piers lets the eye travel very freely from end to end of the cathedral. The plan of Exeter Cathedral is very regular. It has a central avenue and side aisles extending from west to east, both very little broken at the transept, which stands midway. The transept occupying as it does the two towers, there are no transept aisles. There is the usual English secondary transept further east, and the English square east end. Beyond there is a lady chapel. A rectangular chapter house stands south of the south transept. Under the shelter of this transept formerly existed a cloister, which was destroyed in Cromwell's time. Some traces of this cloister, not now perceptible, appeared in Curtis's ground plan dated 1797, republished in the *Builder* of June 6, 1891. In the same number appeared a fine view of the exterior by Mr. Needham Wilson. The long spacious choir was enclosed in the usual position, east of the crossing. At the entrance to the choir is a screen carrying the organ. This position is not now occupied by the organ in many cathedral churches, but it was once customary, and in this instance the effect is very fine. There is an unusually marked love of symmetry in the plan. The large buttresses were rendered necessary by the vaulting of the whole interior. A very large amount of window opening exists. Many of these windows are low, but they are very wide; as a result, the interior is full of light. There are no western towers, and, as a consequence, there is neither a baptistry nor a morning chapel. The architect who designed the west front deserves credit for having accepted the conditions and having made a front which suits an interior of low, broad proportions and which is quite complete without towers. There are three main divisions or stories—a topmost gable kept back a little and pierced by a window, a middle story, and a third and lowest story. There are three entrances, poor and small, as is usual with English cathedrals, but in a fine setting of tabernacle work and sculpture. On examining the north side of the cathedral one is struck by the boldness of the buttresses and the richness and variety of the windows, which occupy so much of the wall space between them. They are all flying buttresses. It is instructive to compare the windows of the nave of Exeter, completed about 1350, with those of the Eastern part of Westminster, and especially of the Chapter House, dating exactly 100 years earlier. The change which had come over architecture during the century could be well appreciated by making the comparison. The Westminster windows are of comparatively tall proportion, and have in the head a moderate amount of tracery, very severe and simple. Many of them are divided into two lights only, and where there are more lights the whole treatment is by geometrical forms alone, and the general effect one of restraint and severity. The Exeter windows are of totally different proportion—wide and low, the arched head far more sharply pointed, the windows divided into a far greater number of lights, and the head occupied by a mass of intricate and varied tracery far more florid and ornate, admitting lines of varying curvature and forms, many of which are widely different from the geometrical shapes in the Westminster window-heads. These windows follow the same rule of making one side of the building correspond to the other. There are said to be forty varieties of window tracery in the Cathedral. The great west window is a fine example of this class of tracery window, but not so fine as the east window of Carlisle Cathedral. The two towers are very unusual, both in themselves and in their position. They are between 100 and 150 years older than the bulk of the remaining building, and they look it. The lower part of them is quite plain, but the upper part is divided into four stories of arcades, partly blind and partly pierced by openings. Proceeding to deal with the interior, Professor Smith said that few could enter it without being profoundly impressed. The whole interior is vaulted, and all in one manner, and that quite in keeping with the rest of the architecture. The proportions are dignified, but not lofty. There is, however, a sense of harmonious correspondence between one and another feature, and there is a flood of light. The proportions are unquestionably the key to much of the dignity of the interior. Those of the nave are, broadly speaking, in double square. It had, however, been necessary to sacrifice a good deal of the dignity of one feature—the triforium. In Exeter the arcade is of fine and dignified design, and sufficiently lofty to be impressive, but the triforium is as low and inconspicuous as it is possible for it to be, while the clearstory—thanks to the alteration in the shape of the windows which had now come about—is also very low. Both these stories are much blended with the vaulting, which is as closely combined as possible with the clearstory windows. The vault is at a stage of development which is most favourable to effect, and it is doubtful if any more successful vaulted structure exists than this. The vault was executed at the same time as the lower parts of the building, which does not always happen to be the case. Hence the whole is perfectly in harmony, and the grand shapes of the different divisions impress the eye without perplexing it. The views looking east and west give opportunities of examining the great windows which close up each end of the fine vistas. A feature of the nave which catches the eye is the minstrel gallery, an extremely rich projecting gallery with twelve niches laden with ornament, and each occupied by a musician playing on a quaint instrument. Among the points of interest in the interior are the lady chapel, parts of the choir, and the transept. In the north transept is one of the largest bells in England, weighing 12,500 lbs. During the Commonwealth a brick wall was built across the cathedral at or near the choir screen, and two preachers occupied "West St. Peter's" and "East St. Peter's." On the Restoration they were expelled by Bishop Ward, who pulled down the wall. Professor Smith proceeded to describe the principal features of the lady chapel: Speke's Chantry, Oldham's Chantry, and Sylke's Chantry, and the Chapel of St. Paul, and remarked that the cathedral is rather rich in small chapels and chantries. He dealt at some length with the beautiful specimens of carving which are to be found in the cathedral, and produced a miserere 700 years old, taken from the cathedral, which he said they all would like to see replaced. In conclusion, he said that in this venerable and somewhat unconventional structure we had a building full of interest, and with a great deal of architectural beauty to repay the trouble of searching for it.

The address was illustrated by a series of new photographs. The miserere was lent by Mr. Harry Hems. At the close a vote of thanks was accorded Professor Smith on the motion of the Master of the Carpenters' Company.

LONDON MASTER BUILDERS' ASSOCIATION.—The following officers of the London Master Builders' Association were recently elected for 1902-3:—President, Mr. G. J. Lough (Messrs. Stimpson & Co.); senior vice-president, Mr. E. J. Brown (Messrs. Brown, Son, & Blomfield); junior vice-president, Mr. A. W. Spencer (Messrs. Spencer, Santo, & Co.); hon. treasurer, Mr. J. Carmichael.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

III.—PREMISES, KENSINGTON.

THE third spring visit of the session was made on March 8 to Messrs. Derry & Toms' premises in Kensington High-street. Mr. F. E. Williams, the architect, kindly met the members, and briefly described some of the difficulties which had to be met and overcome, and which were largely responsible for the ultimate form which the additions have taken.

The chief factors were the absolute necessity for abundance of light and as much uninterrupted floor space as possible for the new showrooms and workshop. The additions are at the rear of Tudor House, in the High-street, and as the existing show and workrooms were largely lighted from the back, it was an exceedingly difficult problem how best to deal with the new premises without interfering with the light of the old. This has been overcome in an able manner by means of a domed building, the upper part, some 28 ft. in diameter, being covered by a light iron framed skylight. The value of floor space made it imperative practically to carry nearly the whole weight upon iron stanchions. These have been arranged in four pairs, with a girder over each pair. These girders receive four girders placed diagonally, upon which the dome rises; the pendentives being formed in concrete upon wooden centering.

An oval-shaped cantilevered balcony forms the first floor gallery, and the whole building will be amply lighted by the glass dome and four large semicircular windows. The necessity of keeping the various sections within the 250,000 cubic ft. prescribed by the Building Act limited the area of the dome section to this amount, the portion under the dome being, of course, cut off from the other parts of the building by the usual iron doors.

The dome is crowned by a cupola, in which is placed an electric exhaust fan; and the greatest attention has been paid to the glass roof to afford every facility for cleaning and for the escape of condensation. From the ground floor to the crown of the dome is 56 ft. The new workroom for about seventy girls is splendidly lighted, and, in fact, every care seems to have been taken by Messrs. Derry & Toms and the architect that the conditions of labour for their workpeople shall be the healthiest and best possible.

The oval first-floor gallery will be finished by a bright polished steel railing surmounted by a copper rail. The copper has been electrotyped on to a wood core, which is believed to be an entirely novel treatment. The stanchions on the first floor will be cased with marble, the caps being plaster copper electrotyped. The ground floor columns will be cased in plaster. The building is at present hardly sufficiently advanced for an opinion to be formed of its artistic merits, but it is certainly a good example of the multitudinous difficulties which an architect is called upon to overcome successfully in a commercial building at the present day.

The proprietors kindly provided tea for the members, and a hearty vote of thanks to them and to Mr. Williams for his trouble brought a successful visit to a close.

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.

THE eleventh meeting of the Discussion Section for this session was held at 56, Great Marlborough-street, W., on the 14th inst., Mr. R. H. Weymouth presiding. The minutes of the previous meeting having been duly read and confirmed, the Chairman read the list of nominations for the ensuing session, as follows, viz.:—Chairman, Mr. Geo. H. Smith; vice-chairman, Mr. J. H. Pearson; hon. secs., Mr. H. Gregory Collins, Mr. E. W. Wonnacott; ordinary members of committee, Mr. F. C. Eden, Mr. W. A. Forsyth, Mr. Geoffry Lucas, Mr. Louis Ambler.

The Chairman then called upon Mr. H. C. Lander to read a paper entitled "Co-operative Homes." As might be gathered from the title of his paper, the author dealt with the question from a socialistic, rather than an architectural, point of view. Several sets of plans were exhibited and explained by Mr. Lander, but the schemes had not been carried out. It was much regretted that the author was obliged to leave early in the discussion,

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Mr. Louis Ambler, in proposing a hearty vote of thanks to the author for his very able paper, said it was not clear to him whether the author meant to apply the co-operative idea to the working classes only. Mr. Lander's paper had given them much food for thought, but in his (Mr. Ambler's) opinion it was an unworkable idea.

The vote of thanks was seconded by Mr. W. Bonner Hopkins, and, having been put to the meeting, was carried unanimously.

The following gentlemen then took part in the discussion, viz.:—Messrs. Sedgwick, J. H. Pearson, H. P. G. Maule, F. Lishman, Jenkins Powell, R. H. Weymouth, and McClay.

It was announced that the next meeting would be held on Friday, April 18, when Mr. A. Needham Wilson will read a paper on "A Tour in the South of France."

MAGNETISM IN TRANSITU.

ON Friday evening of last week Professor Silvanus Thompson gave a lecture at the Royal Institution on "Magnetism in Transitu." He began by pointing out that a permanent magnet loses none of its magnetism when it magnetises a piece of iron. The problem of how magnetism is transferred from one body to another has been studied for hundreds of years. Gilbert, in his book "De Magnete," discussed this problem, and was led to compare magnetism with light. He discovered that if a piece of loadstone is capped by a piece of iron it acts more strongly. The lecturer illustrated this by showing a loadstone which, although by itself unable to lift a nail easily, did so when a piece of iron was put on the other side of it. To illustrate how iron conducts magnetism, a compass needle was placed 3 ft. away from a loadstone, and it was shown that the latter had no effect on the former. When, however, a soft iron rod, 3 ft. long, was placed between the two, the needle was at once deflected.

To show the effect of an electric current on a magnetic field, a horizontal plate of glass with a hole in the centre through which passed the vertical wire carrying the current was sprinkled with iron filings. When the current was turned on, and the plate gently tapped, the filings arranged themselves in approximately circular curves round the wire. Professor Thompson said that magnetism consisted in bringing the molecules of iron into alignment, each molecule being itself a magnet, and all of them consequently pointing the same way when a strong magnetising force was applied to the iron. He illustrated this by showing how Ewing's model magnet made up of a large number of small compass needles behaved when subjected to magnetising forces.

A striking experiment was shown to illustrate the great force that can sometimes be called into play by magnetism. A small iron cup weighing about 3 lbs. had a keeper weighing about 6 ozs. When the cup was magnetised the attraction between them was so great that they could not be easily separated, and the lecturer said that the keeper could support a weight of 300 lbs.

Animated photographs were shown on the screen illustrating the growth of the lines of force round a wire carrying an electric current, and also showing the behaviour of the lines of a force between a horse-shoe magnet and its keeper as the latter was put on and taken off. In the former case the lines of force converged into the keeper, and in the latter they diverged from it. The lecturer pointed out that it was possible to tie lines of force into a knot. In conclusion he laid emphasis on the fact that lines of force always spread sideways, and that magnetic forces were always propagated in a lateral direction.

A CONSTANT HOT-WATER SUPPLY.—An apparatus designed to provide a building throughout with a constant and unlimited supply of hot water is manufactured by Maughan's Patent Geyser Co., of Holywell-row, Worship-street, London, and is known as the "Teba Auto-Geyser." The opening of any hot-water tap in the building draws hot water from the geyser. Fresh cold water then enters the geyser through a ball valve. At the same moment a float is lifted and turns on the gas. When the hot-water tap is closed the geyser again fills, and the ball valve automatically cuts off the gas. A pilot light serves to maintain the temperature of the water in the geyser, and to relight the main burner every time hot water is drawn from the geyser.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The ordinary monthly meeting of the Sheffield Society of Architects and Surveyors was held in the lecture-hall of the Literary and Philosophical Society, Leopold-street, on the 13th inst., Mr. T. Winder presiding. Several gentlemen were nominated for membership, and Mr. H. C. Brameld was elected an associate. Messrs. W. J. Hale and W. Potts were elected auditors. The City Council having agreed to the nomination of a member from the Society to sit upon the School of Art Committee, Mr. E. M. Gibbs was chosen as representative of the Society. A vote of thanks was given to Mr. A. H. Holland for his kindness in letting the Society have the use of the Howard Art Gallery for the recent exhibition of the Royal Institute of British Architects' prize drawings. Mr. F. W. Troup, of London, then gave a lecture on "Leadwork." The following is a summary of Mr. Troup's paper:—"Few people realise to what extent lead was formerly used in the art of building. The ease with which the metal could be reduced from the ore made its use possible with the rudest of appliances. Once reduced to the metallic state it is one of the most imperishable of the metals. It is at the same time the easiest of them all to melt, to cast, or to fashion into various shapes either in the molten or solid state. This country has always been famous for its lead. A French writer of the seventeenth century says:—'The greater part of what we get here comes from England in large ingots called "samnous," weighing 400 lb. or thereby. Germany also sends us some lead, which is in square "samnous" of 120 lb. weight, but the latter is short and less pure than that from England.' Again, Harrison, in his 'Description of England,' says:—'There were mines of lead sometimes also in Wales which endured so long till the people had consumed all their wood by the melting of the same.' We find examples of lead having been used in Babylon, in Egypt, in Greece, and extensively in Roman times. There are many examples of Roman coffins and cists and ingots in the various museums. In the crypts of St. Paul's Cathedral I have seen Roman water-pipes stacked in heaps of old lead. This is kept to be melted down when required for new sheathing for the dome or other parts of the roof. I do not suppose that in this year of grace, 1902, a Roman water-pipe would be sacrificed in the melting pot, even of St. Paul's Cathedral, but that was the obvious intent when the pipes were stacked there. Doubtless many have ere now been melted up, and that which once conveyed water to Roman London now conveys the rain water from the dome to the drains of the Cathedral. In mediæval times lead was used for covering the roofs of the finest buildings, also for covering and decorating spires of churches and cathedrals. The London churches particularly were noted for their fine lead covered spires, chiefest of them all, that on old St. Paul's. Stow says this was 520 ft. high—260 ft. stone and 260 ft. lead covered spire. It was burned down in 1561, a century before the Great Fire of London. Much earlier than this, in 1090, we find (as quoted by Mr. Lethaby) the Bishop of Coutances in Normandy sending to England for Brisenetus, the plumber, to make afresh the leadwork for the roofs and tower. Numerous though the examples of English leadwork in church and palace were, and still are, I doubt if we have left to us quite such gorgeous examples as are to be found in some of the French roofs, spires, and fleches. But I have touched on examples enough to show how much esteemed lead was for practical use in the Middle Ages, and how well the plumbers rose to the occasion, displaying their leadwork so that it held its own with any of the materials used in the greatest of their masterpieces. Yet with all this, the work was often all done on the site of the building. No elaborate machinery or complicated tools were needed. The plant consisted of a frame some 4 ft. to 6 ft. wide, and 12 ft. or more long, on which a sand bed could be laid. Besides this little more was wanted, except a pot in which to melt the lead. The molten metal was flooded over the levelled bed of sand, and from the sheet so cast everything could be wrought, bossed, and beaten up, whether it were a flat sheet for roofing or a crocket on a spire or a lead-covered angel on a pinnacle. Various parts were cast in the same sand bed by imprinting moulds or patterns and running the molten lead into them, but the great mass of the work was beaten up from the flat sheet, and the great art of the plumber consisted in fixing, laying, or hanging his lead in such a way as to cover and protect the roof or spire from wet, and yet keep his soft and ductile metal from slipping or dragging itself off. If care were taken that the sheets should not tear or crack by the contraction of the metal at night after being beaten on by a hot summer sun, there was no reason why the material should not last for ever, none, at least, except fire, from which no material is safe that rests on a wooden substructure. Gradually the use of lead for anything but the most utilitarian purposes died out, and now 'plumber' and 'sanitary engineer' are almost convertible terms. The 'lead-work' of a building conjures up pipe casings or the grand display of sanitary waste-pipes, overflows, and ventilators, culminating in the inevitable cowl that tells of modern sanitation. There is, however, no reason why lead should not be restored to its ancient prestige and be used once more as a pleasant and sightly material, and one on which the workman can display his fancy and lavish his labour of love." On the motion of Mr. Paterson, seconded by Mr. W. J. Hale, and supported by Messrs. W. C. Fenton, T. Winder, and others, a hearty vote of thanks was accorded to the lecturer.

MANCHESTER SOCIETY OF ARCHITECTS.—The last meeting of the winter session was held on the 13th inst. in the Chamber of Commerce, Mosley-street. Prizes for the work of the past session were presented by the President, Mr. Darbyshire, to the successful students, whose drawings, together with those of their competitors, were hung round the room. The President announced the names of the prize-winners in the Class of Design for February, for which the subject was a "Gatehouse to a Public Institution." In the senior class, Mr. J. T. W. Brooke took the prize, and in the junior, Mr. G. F. Ely, while special second prizes were awarded to Mr. Claude Paterson and Mr. Harold Hill. The winner of the prize offered by Mr. John Holden for the design for a public art gallery was Mr. Percy A. Horrocks. Mr. Isaac Taylor then gave a criticism on the drawings submitted, of which over fifty were exhibited. He congratulated the Society on the high standard of, and increased interest taken in, the students' work. He discussed the drawings one by one and pointed out the merits and defects of each design. Besides the four prize designs for a gatehouse above mentioned, Mr. T. F. Shepheard's bandstand, and Mr. C. Paterson's shopfront were picked out as particularly good, both in design and in drawing. The drawings are to be exhibited next week at the Bury Technical School.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual meeting of the Northern Architectural Association was held on the 12th inst., the President (Mr. Frank Caws, of Sunderland) being in the chair. The meeting was held in the Building Trade Exchange, Northumberland-street, where in one of the rooms the students' drawings were exhibited. The annual report, which was read by Mr. Arthur B. Plummer (hon. secretary), recorded the increasing success of the educational work of the Association. Since the last annual meeting four members, three associates, and twenty students had been elected, and the roll now stood as follows:—Members, 57; associates, 74; students, 80, making a total of 211. The Council again desired to recommend the Architects' Benevolent Society to the members as worthy of support. The financial statement showed that the balance in hand was 38*l.* 19*s.*, and that the Association had 50*l.* invested. Mr. H. C. Charlewood presented the librarian's report, 201 volumes having been issued to the students. Mr. Plummer read the report of the secretary of the Students' Sketching Club. The Chairman commented on the great fulness of the work done as shown by the reports, and he did not think that they could adopt them without expressing a warm feeling of indebtedness and gratitude towards their energetic honorary secretary. The reports were adopted on the motion of Mr. Badenoch, seconded by Mr. Dyson. The elections resulted as follows:—President, Mr. F. Caws; Mr. J. W. Taylor, vice-president; Mr. A. B. Plummer, hon. secretary; Mr. J. T. Cackett, hon. treasurer; Mr. H. C. Charlewood, hon. librarian; Messrs. H. G. Badenoch, J. Bruce, R. B. Dick, J. W. Donald, and T. Reay, were elected as the

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Council, and Mr. H. Oswald and Mr. R. P. S. Twizel were appointed associates. Prizes were then presented by the President to the successful students.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. J. M'Dougall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Fulham Borough Council 10,720*l.* for purchase of land; Lewisham Borough Council 5,335*l.* for the acquisition of land for an open space; Poplar Borough Council, 15,400*l.* for electric light installation; Islington Borough Council, 10,438*l.* for electric light installation; Stepney Borough Council, 8,010*l.* for paving works, and 3,530*l.* for asphalte paving; Kensington Borough Council, 11,745*l.* for public convenience, paving works, Town-hall extension, and street lighting; St. Marylebone Borough Council, 3,400*l.* for underground convenience; St. Olave's Guardians, 16,000*l.* for erection of cottage homes for children; and the Asylums Board 24,000*l.* for additional accommodation for smallpox patients.

The Works Department.—The General Purposes Committee submitted the following report:—

"In our report of February 3 last, we stated that we proposed in due course to submit for the Council's consideration a draft order of reference to the Works Committee. We have carefully considered the matter and now desire to ask the Council to adopt the order of reference which we present with this report.

We should explain that the order of reference is practically an embodiment of existing standing orders, the 'Works Committee' having been substituted for the 'Finance Committee,' the 'Executive Committee' or the 'Works manager,' as the case may be, and the only new provision of importance is rule 6, under the terms of which it is suggested that in the event of it appearing to the Works Committee that the cost of a work will exceed the amount authorised by the Council, the Works Committee shall inform the Council of the fact.

It is necessary that other standing orders relating to the execution of works by the Works Department should be amended by the substitution where necessary of the words 'Works Committee,' and we accordingly submit these standing orders as revised, and would ask the Council to rescind the present standing orders affected.

The concluding paragraphs of standing order No. 202 provide that the principle of the arbitration clause inserted in the Council's building contracts shall be applicable to the settlement of any questions that may arise between officers of the Works Department and the certifying officers of the Council, and the last paragraph of the standing order is as follows:—

For the purpose of applying the above principle the points of final difference between the officers of the Works Department and the certifying officers are to be reported to the General Purposes Committee, and that Committee shall be empowered to give the necessary authority for the points in dispute to go to arbitration, and to appoint an arbitrator after receiving agreed nominations from the officers of the Works Department and the certifying officers.

We consider that this method of applying the principle referred to is inconvenient, and we are accordingly suggesting in recommendation (*d*) an amendment of the last paragraph of the standing order in question. We recommend—

(*a*) That the following be the order of reference to the Works Committee:—

The Committee shall consist of seven members.

The Committee shall, unless in any case otherwise ordered, carry into execution all works which the Council resolves to execute without the intervention of a contractor; and shall also, unless in any case otherwise ordered, carry out jobbing works and repairs, including the work of the erection of hoardings, fans, and shoring.

The Committee shall consider and report upon all questions relating to the appointment, pay, duties, promotion, or dismissal of all officials on yearly salaries in the Works department. The employment and control of all officials on weekly wages (with the exception of the staff of the Works accountant), and of all foremen, timekeepers, workmen and persons of a like class, shall devolve upon the manager.

The Committee shall present quarterly reports to the Council as to the estimated expenditure on maintenance account during the ensuing three months in respect of the equipment and maintenance of all workshops and yards used by the Works department, and the provision of plant, machinery, horses, and materials or other things for stock. On the sanction of the Council being given to such expenditure, the Works Committee shall have power to expend money for such purposes up to the amount sanctioned, and to enter into contracts therefor on behalf of the Council. All expenditure on capital account shall be subject to the usual procedure of the Council as regards such expenditure.

When the Council shall have resolved that any work shall be carried out by the Works Committee, and shall have passed the necessary estimate of the cost of such work (hereinafter called the 'accepted estimate'), the Committee shall have power to enter into any contract on behalf of the Council and to incur any expenditure necessary for the carrying out of the work within the limit of such accepted estimate.

The Committee may execute any works referred to it by a Committee of the Council, provided that the cost of each work is under 50*l.*, and in the case of emergency may execute any works which a Committee of the Council or an officer of the Council is entitled in such case to order to be executed.

The following rules shall be observed by the Committee:—

1. The Committee shall keep separate accounts in such a manner as to show the cost of each work executed.

2. The actual cost and final estimate of a work shall be ascertained as soon as possible after the completion of the work.

3. Statements showing the estimated and actual cost of the works completed up to September 30 and March 31 shall be presented by the Works Committee to the Council within three months of the aforesaid dates. Fourteen days before such statements are laid before the Council the account for each work shall be sent by the Works Committee to the Committee on whose behalf the work shall have been carried out, and any report which such Committee may desire to make shall be brought up to the Council at the same time as the statement submitted by the Works Committee.

4. Such statements shall show (*a*) the amount of the accepted estimate, (*b*) the amount of the final estimate if the work has been varied by reason of certified additions or deductions, and (*c*) the amount of the certified actual cost of each work executed.

5. In the case of jobbing works, which for this purpose are defined to be works in respect of which bills of quantities, complete specifications, and drawings have not been supplied, the accounts shall show (*a*) the schedule value ascertained in accordance with the schedule of prices, and (*b*) the certified actual cost, and shall be presented to the executive committees concerned from time to time as the works are completed, the totals being subsequently reported by the Works Committee to the Council at the same time as the statements referred to in Clause 3.

6. Whenever the Works Committee are satisfied that the expenditure on any work of which the accepted estimate is over 1,000*l.* will exceed the amount voted for that work, the Committee shall report the fact to the Council when submitting the next half-yearly statement referred to in Clause 3.

7. In the case of any work the actual cost of which has exceeded the accepted estimate, the Works Committee shall obtain the approval of the Council to the amount of the excess.

(*b*) That the following be standing orders of the Council:—

General.

Any Committee contemplating the execution of any work shall, before coming to a decision as to how the work should be carried out, obtain an estimate from the proper officer. If the Committee on receiving the estimate, shall decide to recommend the Council to have the work carried out without the intervention of a contractor, they shall, before reporting to the Council, refer such estimate, together with full plans and specifications, to the Works Committee for consideration. If the Works Committee express their willingness to carry out the work at the amount of such estimate, the Executive Committee shall thereupon take up a recommendation to the Council, at the same time submitting the full plans, specifications, and estimate of the proposed work, and such estimate, if approved by the Council, shall be called the 'accepted estimate.'

When a work has been referred to the Works Committee to carry out, the work shall not be commenced until the officer under whose supervision the work is to be executed shall have given a written order for the work to proceed. There shall be no variation of the plans and specifications without a written order from such officer.

The officer, under whose supervision a work has been carried out by the Works department, shall certify as to the satisfactory completion of the work and the amount of his final estimate, or the value on the schedule of prices, as the case may be.

Jobbing Works.

All works referred to the Works Committee to carry out, which cannot be treated as estimated works, and for which no estimate has been prepared, shall be considered as jobbing works.

No committee, however, shall order a work to be carried out as a jobbing work unless it is satisfied that there is sufficient reason for not treating the work in question as an estimated work, and, except as regards dangerous structure work and works undertaken on emergency, in every instance the committee shall have laid before it by the engineer, architect, or other certifying officer, as the case may be, a rough estimate of the cost.

A schedule of prices agreed upon between the manager of works and the architect and engineer, and approved by the General Purposes Committee, upon which in respect of jobbing works the estimates, measurements, and certificates of the architect, engineer, or other certifying officer shall be based, shall be revised periodically.

Financial.

The accounts of the cost of all works executed by the Works Department shall be kept by a Works accountant, whose office shall be at the Works Department, Belvedere-road, but who shall report direct and be responsible to the Works Committee for the accounts and for his staff.

Manager of Works.

The head of the Works department is to be styled 'manager of works,' and is to be responsible under the Works Committee for the execution of all works carried out by that committee on behalf of the Council; for advising as to the purchase of plant and material; the regulation and direction of all workshops belonging to the Council; and the supervision of all officials employed upon the execution of works carried out by the department; he shall employ and have the sole control of all officials on weekly wages employed upon such works, and of all foremen, timekeepers, workmen, and persons of a like class; he is to give his whole time to the duties of his office, and not to take any private business; and any fees received by him, either as a witness or in any other capacity, and any discount or allowances on materials purchased, are to be paid to the Council; he is to hold his office during the pleasure of the Council, and the appointment is to be in other respects subject to the conditions already laid down by the Council with regard to all appointments made in its service.

The manager shall report to the Works Committee with regard to the purchase of materials, stores, plant, timber, machinery, horses, and other things required by him for the execution of any work, or for stock.

It shall be the duty of the manager to draw the attention of the Works Committee to any case in which, during the execution of any work, it appears that the cost of the work will exceed the amount of the 'accepted estimate,' and to obtain such authority from that Committee as may be required.

It shall be the duty of the comptroller to advise the Works Committee as to the regulations for the accounts of the Works Department, and from time to time to make test audits of such accounts.

The Works accountant shall be required to furnish the manager with any statement or information he may desire as to the accounts generally of the works carried out by the Department.

(*c*) That standing orders Nos. 182 to 199 inclusive, and 424 and 425 be rescinded, and that the order of reference to the Finance Committee be amended by the omission of the last paragraph, viz., that conferring upon the Committee control of the Works department.

(*d*) That standing order No. 202 be amended by the substitution for the last paragraph thereof of the following, viz:—

Where points of difference arise between the certifying officer and the manager of works, upon which they are not able to come to an agreement, such officers shall report to the Works Committee, who shall consider the points in dispute, and in the event of the certifying officer or manager of works desiring that any of such points shall be submitted to arbitration, the Works Committee shall arrange therefor.

(*e*) That the following provision of Standing Order No. 275 relating to excess votes—viz., 'the vote for the excess expenditure above any excess for which the Committee ordering the work are responsible shall be obtained by the *Executive Committee at the time of the Finance Committee's* half-yearly report to the Council,' be amended by the substitution for the words in italics of the following:—'Works Committee at the time of their.'

(*f*) That Standing Order No. 436, which provides that officials, clerks, and foremen receiving weekly or monthly wages who are absent in consequence of sickness or accident are to be allowed full pay or reduced pay during a reasonable period at the discretion of the Finance Committee, be amended by the substitution of the words 'Works Committee' for 'Finance Committee.'"

Dr. Napier thought it was essential that there should be a Works Department as a protection against contractors. With regard to the adverse balance on the working of the Department, he believed the Council had far more than saved this by the protection the Department afforded against the contractors. He believed the Works Department had a better chance of succeeding than ever before.

Mr. Beachcroft said they were departing from what he considered the first principles which governed the administration of local bodies in imposing the work on this Committee in the manner indicated in the reference, and he thought they were taking a very dangerous step. There should be no doubt as to who was responsible for the purchase of plant and

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material, and he moved to add words to the recommendation, to the effect that the Committee should be responsible to the Council for the purchase of all plant and material.

Mr. Campbell seconded the amendment, which the Chairman ruled out of order.

Mr. Sears regretted that there was to be a revival of the old order of reference. The only new proposal took this form—that in the event of its appearing to the Works Committee that the cost of any job would exceed the amount authorised, the Council should be informed of the fact. He failed to find that the department was, by the new scheme, being placed on a sound business basis, which meant that there must be a complete reorganisation. He advocated the appointment of a general manager who should have the control of the department, with departmental managers under him, in both building and engineering sections.

Sir Arthur Arnold remarked that the Committee's recommendations were in accordance with the suggestions he brought before the Council eight years ago.

The Clerk then read an urgency report of the Committee recommending that the following form the Works Committee :—Lord Welby, Messrs. W. Bruce, E. A. Cornwall, L. Sharp, E. Smith, A. M. Torrance, and D. Waterlow.

Mr. Dew protested against the charges of malingering made against the workmen in the employ of the Council, and alleged that the Department was loaded with officialism.

Mr. W. Peel, M.P., said he noticed it was proposed to keep separate accounts in such a manner as to show the cost of each job. If that had been done in the past they could have told how many bricks per day had been laid.

Mr. Howell J. Williams said the proposed committee should first be elected, and the order of reference then prepared by them. Anything else was absurd, and he moved accordingly.

The motion was, however, rejected.

After some further discussion, the recommendations were adopted, and the Council proceeded to deal with the urgency Report proposing the names of the new Committee.

Mr. Bruce withdrew his name, and that of Mr. Ward was substituted.

Mr. W. Peel, M.P., thought the new Committee would, to a certain extent, be an investigation committee, and he said he felt that no member of the old Works Sub-Committee should sit upon it.

Dr. Napier moved that the selection of names be postponed for a week, but on a division this was rejected by a large majority, and the Committee was elected as recommended, with the substitution of Mr. Ward for Mr. Bruce.

Historical Records and Buildings Committee.—The following order of reference to the Historical Records and Buildings Committee was agreed to :—

"The Committee shall consist of not less than twelve and not more than fifteen members.

The Committee shall have charge of the library, historical records, antiquities, and works of art belonging to the Council, and shall have the control, maintenance, and management of museums and places of historic or architectural interest (together with any property connected therewith) purchased by or presented to the Council.

The Committee shall consider and report upon questions relating to historic buildings and sites, monuments and subjects of antiquarian interest in London.

The Committee shall consider and report upon all matters arising under—

(*a*) The Ancient Monuments Protection Act, 1900.

(*b*) Section 60 of the London County Council (General Powers) Act, 1898, relating to the acquisition and maintenance of buildings of historic interest and works of art in London."

Old-street Improvement.—A scheme for widening Old-street between Hoxton-street and No. 341, Old-street to about 60 ft., at a cost of 14,250*l.*, was adopted upon the recommendation of the Improvements Committee.

Erection of Working-class Dwellings in Grove End-road, St. John's Wood.—The Housing of the Working Classes Committee reported as follows :—

"On March 4, 1902, the Council referred to the Building Act Committee and to us a petition from residents in and around Grove End-road, St. John's Wood, praying that the erection of dwellings for the working classes in Warwick-place, Grove End-road, may not be allowed. The Building Act Committee will, of course, deal with the proposal whenever it comes before them from the point of view of the London Building Acts. We are informed, however, that the dwellings are to be erected by Lord Howard de Walden, and are designed to provide re-housing accommodation for persons to be displaced by the building of high-class flats near Regent's Park on the Howard de Walden estate. Further, we understand that it is proposed that the dwellings shall provide for the re-housing for all such persons. While expressing no opinion as to the particular site selected, we think that if this intention is carried out the erection of these dwellings may well meet with the approval of the Council."

Wooden Structures Erected on Public Occasions.—The Building Act Committee reported the decision of the Divisional Court, that the Council of the City of Westminster (and inferentially every Borough Council) is the proper authority to control, approve, or license wooden structures erected on public occasions within its district, and that the Borough Councils are the proper authorities to take proceedings against persons who have, without licence, permission, or approval erected such structures. As to whether such structures are or are not subject to the supervision or inspection of the District Surveyors under the London Building Act the Court gave no decision. In connexion with this decision the Committee reported as follows :—

"We have also had under consideration the question as to how far the decision of the High Court applies to the strengthening of balconies for use on public occasions. This work is dealt with under Part IX. of the London Building Act, 1894, *i.e.*, the part dealing with dangerous structures, and the Council has not treated the shoring erected to make such balconies fit to bear extra weight as structures put up on a public occasion. Accordingly whenever a public function has been announced involving a procession through the streets likely to attract large numbers of persons, a circular letter has been sent out drawing attention to the desirableness of all balconies on the line of route being shored up. An inspection has been subsequently made along the route, and where it has been found that an owner has not taken steps to secure a balcony, such balcony, if found to be insecure, has been dealt with as a dangerous structure. We have come to the decision that the course hitherto followed in dealing with balconies should be continued, and in order to avoid any misunderstanding we have given instructions for an intimation of the Council's intention to be sent to the Borough Councils."

Proposed Railway Station, Essex-road.—The same Committee recommended as follows, the recommendation being agreed to :—

"That the Council, in the exercise of its powers under Sections 45 and 53 of the Great Northern and City Railway Act, 1892, do not consent to the erection of a station building on the north-west side of Essex-road, Islington, to abut also upon Canonbury-road, in accordance with the plans submitted with the application of Sir Douglas Fox and partners on behalf of the Great Northern and City Railway Co."

Office Accommodation.—The Council agreed to spend 2,400*l.* on structural alterations of offices in Cockspur-street with the view to providing adequate accommodation for the architect's, comptroller's, statistical, and engineer's departments.

Inspection of Kitchens.—The Public Health Committee recommended the Council to communicate with the local authorities in favour of the inspection of the kitchens of hotels and restaurants, and the removal of insanitary conditions.

This was adopted without discussion.

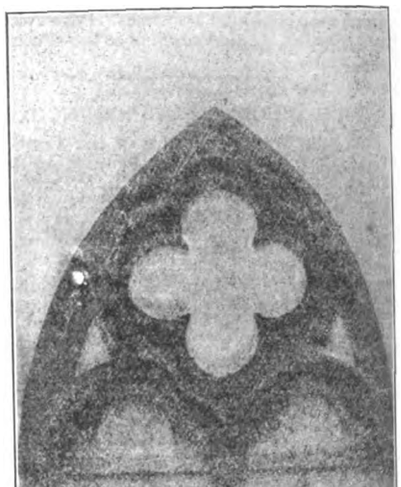
Proposed New Bridge.—Mr. Davies moved :—"That, taking into consideration the long distance between Battersea and Wandsworth Bridges, it be referred to the Bridges Committee to consider and report as to the advisability of providing direct means of communication between Fulham and Battersea."

The motion was adopted.

The Council adjourned at seven o'clock.

THE INSTITUTE OF BUILDERS.—The following new officers and members of the Executive Council were elected at the annual meeting of the Institute of Builders :—President, Mr. W. F. King (Messrs. W. King & Son) ; Vice-President, Mr. Woodman Hill (Messrs. W. Hill & Co.) ; Hon. Treasurer, Col. Stanley G. Bird ; Hon. Auditor, Mr. A. E. Parker (Messrs. Patman & Fotheringham) ; elected members of the Council, Mr. A. F. Randall (Messrs. Kirk & Randall) ; Mr. J. Bell, J.P., Cambridge ; Mr. W. Nicholson, Leeds ; Mr. B. E. Nightingale, London ; Mr. W. Sapcote, Birmingham.

SALES BY AUCTION.—On Thursday last week, at the Auction Mart, Messrs. C. C. & T. Moore disposed of freehold and leasehold properties to the extent of 13,660*l.*—a freehold building site, Bear-gardens, Southwark, 6,100*l.* ; factory and land, Broomfield-street, Poplar, 1,875*l.* ; site and buildings, Furze-street, Bromley-by-Bow, 2,200*l.* ; leasehold stabling in Speke-road, Battersea, 400*l.* ; freehold stabling in Devonshire-place, London Fields, 710*l.* Also 48 and 58, Mornington-road, Wanstead, 625*l.* ; and four freeholds, Candy-street, Old Ford, 1,200*l.*



A PIECE OF TRACERY IN BRICKWORK.

THE above piece of tracery in brickwork is designed and executed by a working bricklayer, Mr. T. Smith, of 19, Deloraine-street, St. John's, S.E. It seems a very creditable piece of brickwork, which we are pleased to illustrate.

COMPETITIONS.

NEW BAPTIST CHURCH AND SCHOOLS, ILKLEY.—After consideration of the forty-two sets of designs submitted, and on the recommendation of their professional advisers, the Committee for this building accepted, as stated in our last issue, the designs marked "A," by Messrs. Garside & Pennington, architects, of Pontefract and Castleford. The designs provide for a church to seat 500, erected in free Gothic treatment in stone, with tower and spire, and covered with red tiles ; also a large schoolroom to seat 300, suites of classrooms, &c., and conveniences, and caretaker's cottage. The total cost is 8,000*l.* Messrs. Garside & Pennington have received instructions to proceed with the work.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—At the meeting of this Institution held on March 14 at the Westminster Palace Hotel, Mr. Kenneth Gray, Vice-Chairman, presiding, the paper read was on "The Uses of Engineering Models," by Mr. Percival Marshall, A.I.Mech.E., Chairman. The author commenced by pointing out that the high-class condensing steam-engine of to-day can trace its origin back to a working model of one of Newcomen's engines constructed in the eighteenth century, for James Watt made his famous invention of a separate condenser and air-pump as the result of some experiments with a working model engine of this type, which had been placed in his hands for repair. Many interesting models which are to be seen in the South Kensington Museum show that in the early days of engineering invention the construction of working models proved of considerable assistance to those engaged in the development of new ideas. After pointing out the historical value of models as a record of engineering progress, the author suggested that present-day firms would confer a valuable benefit on engineering posterity if they would make a point of presenting to the national collection at South Kensington a scale working model of all important novelties in engineering construction which they might introduce. Dealing with the scientific uses of models, the author proceeded to describe the testing of model ships as carried out at the experimental tanks belonging to the Admiralty, Messrs. William Denny & Bros., and the United States Government, and also quoted the Hon. C. A. Parsons' experiments with modern propellers, which were conducted in connexion with the design of the *Turbinia* and the other high-speed turbine-driven vessels. Further instances of the uses of models for experimental investigation described were Pro-

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fessor Dalby's models for investigating the balancing of engines, and Mr. F. W. Webb's model for experimenting with locomotive valve gears. The commercial uses of models were then considered, instances being given of the value of scale models for exhibition purposes to illustrate such classes of engineering work as shipbuilding, dock, pier, and bridge construction, and other work which could not be exhibited in the ordinary way. The commercial advantages of inventors' models, and of small scale models for use by firms handling specialities which were too large to keep permanently on view, or which might require to be sent for inspection to a client at a distance, were next discussed, and reference was also made to the uses of models in law courts and arbitration cases, where such matters as infringement of patents, light and air cases, party-wall disputes, &c., were being tried. The author then passed on to the important uses of engineering models in connexion with educational work, and described the many ways in which sectional and other models are of value to the engineering teacher in facilitating the instruction of his students. Such models when used in the lecture-room not only enable the lecturer to make his subject clear to his audience, but they are far more interesting to the student than ordinary wall diagrams or blackboard sketches, and by attracting his closer attention enable him to more easily remember the information which is being imparted to him. The author advocated the construction of simple, well-designed model engines in technical school workshops in preference to work of a heavier character, expressing his opinion that the average student would learn more about the construction and working of an engine by making a complete model himself than by making one or two parts only of a large engine, and, moreover, would take a far greater interest in doing something which would be entirely his own work when finished. Such a model would call for more delicate and accurate workmanship than a larger engine, which was an advantage in the right direction. A description was then given of a valve-gear model used by the Great Eastern Railway for the instruction of locomotive drivers and firemen, the model being supplemented by a theoretical indicator diagram printed with explanatory notes, a copy of which is given to each man. The author concluded by referring to the value of model-making as a hobby, and quoted several instances of excellent work accomplished by engineering students and amateur mechanics in their spare time. The paper was illustrated by a complete series of lantern slides, and by a large number of exhibits of the various classes of models referred to by the author.

TRADE CATALOGUES.

THE General Electric Company send an illustrated catalogue of designs for electrical illuminations, in connexion with the approaching Coronation, which they are prepared to carry out.

Messrs. Herbert Morris & Bastert, of Loughborough, send us their catalogue of ordinary and travelling pulley blocks. The latter when made with geared trolleys are extremely useful adjuncts in manufacturing establishments and on outdoor structural work. "Runways" are also made for use with the pulley blocks, serving every part of a works, running from one department to another, with branches to any desired point, forming a perfect network of communication. Thus a lad is enabled to pick up a ton load and deliver it a hundred yards away in a few minutes. The list gives illustrations showing various useful applications of the system

Messrs. Twyfords, Ltd., of Cliffe Vale Potteries, Hanley, send us their "Twentieth Century Catalogue of Sanitary Specialities." It is a well-bound volume of about 200 leaves, clearly printed and admirably illustrated. Many of the illustrations are excellent examples of colour-printing. The work is divided into two parts, the first comprising cast-iron baths and articles made in Royal C.V. porcelain, earthenware, "Vitrina" ware, and cane ware, and the second dealing with enamelled fireclay goods and accessories. The place of honour on the first coloured plate is given to the "Twycliffe" siphonic water-closet; two examples are shown, one with the basin decorated in blue and gold, and with the cistern enclosed in a porcelain casing similarly decorated, and the other with an ivory-white basin with ornament in relief, and with the cistern cased with wood. The next three plates show other varieties of the same apparatus, and on the backs of the plates sections of the basins and fittings are drawn one-eighth full size. The "Axis" siphonic closet follows. Nineteen plates are devoted to various types and combinations of washdown closets, and six to the obsolescent wash-out closets. Only one complete valve-closet is shown, and that forms one of thirteen illustrations of valve-closet basins, slop-hoppers, and slop-tops, crowded together on a single plate, which is followed by a plate of pan-closet and other objectionable basins. Among the other illustrations in this section we notice some examples of closets with the cisterns fixed immediately above the seats, railway-car hoppers, cheap cane-ware closets and traps in separate pieces, flushing cisterns, flush-pipes, pulls, and other accessories. It is a pity that so much labour has been expended in designing and printing the meaningless ornament so profusely bestowed on many of the closet-basins. Architects, at any rate, ought to know better than to select fittings "decorated" in this inartistic fashion. A plain white or ivory surface, on which every speck of dirt can be seen, is in every way most satisfactory, but many plumbers and householders have yet to be educated to see this. Many of the lavatory basins are disfigured in a similar manner by floral decorations sprawling without rhyme or reason over the basins and slabs. Of course this is a trade catalogue, and the trader considers himself bound to produce what his customers desire, but it is possible that the trader might be agreeably surprised if he would venture to set a new fashion instead of weakly following an old one. Among the lavatories are many which can only be regarded as old-fashioned, but in front of these are placed others of better design with improved wastes and overflows of various kinds. The "Sphere," the "Cardinal," and the "Neros" can all be recommended. The woodwork of some of the cabinet lavatories (such as No. 377) is well-designed, but in many of the examples it is commonplace or worse. The new lavatory stands and supports are more satisfactory; No. 392 is a good range of basins with marble slabs and back and brass tubular supports. Space would fail us, however, if we were to attempt to pass in review the sixty-three plates of lavatories; there are varieties to suit different tastes and different purses. The trapped urinal basin to which the place of honour is assigned in the urinal section is of doubtful value; in our opinion the type shown on the next plate is much better. In the fireclay section illustrations are given of strong water-closets and other fittings, including some fine examples of double and treble sinks. The catalogue, as a whole, will be of great service to architects and builders. It contains sanitary fittings of every kind, suitable for houses of different classes, hotels, schools, hospitals, and other buildings. The prices are stated in nearly every case, and the dimensions are given in feet and inches and in centimètres and millimètres.

The Leicester Laundry Engineering Co. (Leicester) send an illustrated catalogue of their laundry machinery, including their patent "open-end" washing machine, in which the machine is fed at one end, instead of at the side; by this arrangement all stooping during the process of loading or unloading is unnecessary, and the clothes are removed from the machine ready drained by having the division perforated. The central shaft passes through the whole length of the machine, and is enclosed with brass tubing; this shaft is of steel, and, passing from end to end of the inner cage, prevents the twisting of the cage on reversing. The lid of the feeding door is arranged similar to a double hinge, one half falling over the gap between the inner and outer cage, thus preventing any clothes dropping inside. The catalogue also shows wood rotary washing machines, and boilers and driving engines, &c.

Messrs. Jones & Campbell (Larbert) send a small catalogue and price-list of portable and other ranges, stoves and grates; among the stoves the "Slogan" slow combustion cylindrical stove, with brick lining, seems a useful one where saving of space and of fuel is important.

We have received from Messrs. G. B. Kent & Sons their 1902 catalogue of painter's brushes, graining tools and soldering, brazing, and paint-removing lamps.

Messrs. Richard Moreland & Son send a compact but very useful and well-arranged catalogue of their steel stanchions and box girders, with full tables of bearing capacity and weight. To the catalogue are also appended a good many sections and descriptions of trussed steel roofs and theatre trusses erected by them in various buildings, and a table of sizes of steel bases and brick piers for loads from 20 to nearly 200 tons. A quotation from a report on one of their structures by Mr. A. T. Walmisley gives very satisfactory testimony.

Messrs. Norton & Gregory send us a small book of samples of their tracing cloths and tracing papers, which seem excellent in substance and surface, and the tracing-cloths are absolutely transparent. They send also a price list of their terms for various methods of reproducing drawings, and for mounting competition drawings, &c.

Messrs. Pilkington Bros. (St. Helens) send a description and illustration of their patent wired rolled glass, which has before been recommended in our columns, and also a description and diagram of their prismatic rolled glass for deflecting the light towards the back of an apartment.

Messrs. Potter & Co. send us an illustrated pamphlet on their various forms of concrete and steel floors, among which we may especially notice Diagram F, for a floor under a ground floor sick ward, which is supported entirely on concrete arches and piers, no steel joists being used except small corrugated steel tension rods embedded in the concrete.

The St. Pancras Ironwork Company's latest catalogue offers everything that can be required for the best fitting of stables in regard to stalls and manger fittings, ventilation, and drainage. The catalogue is fully illustrated, and everything in it shows a thoroughly practical consideration of the subject.

Messrs. Pilkington & Co. send us a pamphlet on their asphalte materials, including Pyrimont Seyssel asphalte, Limmer asphalte, and Polonceau asphalte. The last-named is a material manufactured by them, based on an analysis of Seyssel asphalte, and is stated to be superior to Seyssel at a considerably reduced cost. It is suitable especially for the flooring of warehouses and the paving of coach-houses, stables, &c. The results of some tests of this at Kirkaldy's are given. They give also details and sections of asphalte roofing, consisting of a layer of Polonceau asphalte ½ in. thick, then a layer of specially-prepared hair felt, which in turn is covered with a finishing coat of Seyssel asphalte ½ in. thick. Their white Silica asphalte is recommended for the lining of fountain basins and the paving of corridors, terraces, &c.

Messrs. Ewart & Son send an illustrated catalogue of their numerous forms of revolving cowls, windguards, and elbow-flues, for chimneys.

BOOKS RECEIVED.

THE PARSON'S HANDBOOK. By the Rev. Percy Dearmer, M.A. Fourth Edition. (Grant Richards.)

A TREATISE ON THE ART OF GLASS PAINTING. By Ernest R. Suffling. (Scott, Greenwood, & Co. 7s. 6d.)

MINEHEAD, PORLOCK, AND DUNSTER (Homeland Handbooks Series). By C. E. Larter. (The Homeland Association. 6d.)

COMPANION TO ENGLISH HISTORY (MIDDLE AGES). By F. Pierrepoint Barnard, M.A., F.S.A. (Clarendon Press.)

HISTORY OF TRADE UNIONISM. By Sidney and Beatrice Webb. New edition. (Longmans.)

GAS AND GAS-FITTINGS, FOR THE USE OF ARCHITECTS, BUILDERS, AND GAS CONSUMERS. By H. F. Hills, F.C.S. (D. Fourdrinier, *Builder* Office.)

SCHOOLS, HIGH FELLING, DURHAM.—A site in Falla Park-road was secured twelve months ago, and a portion of the Heworth School Board's scheme is nearly completed by the erection of a junior school to accommodate 320 children and an infant department for 200. It is also intended in the course of time to erect a mixed school. The architect for the building is Mr. H. Miller, Felling. The schools have been erected on the central hall principle, with classrooms grouped around, and light has been secured mainly by windows in the gables. The junior and infants' schools are in two separate blocks, each of one story, with the exception of the central hall, which has clearstory windows and roof lights. Sherburn bricks have been used to face the exterior walls, and internally there is a white glazed brick dado. In addition to the various classrooms, apartments for teachers, and cloakrooms, have been provided in each block. There are partly-covered playgrounds. Mr. J. W. Braithwaite, of Heaton, has been the contractor for the work.

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Illustrations.

DOORWAY, ST. SAUVEUR, AIX (PROVENCE).

THIS drawing, representing one of the doors from the main western portal of the Cathedral of St. Sauveur at Aix-in-Provence, was one of the drawings that gained for Mr. Wontner Smith the Pugin Studentship this year. It has been made from the cast at South Kensington.

Though a very good drawing, it has some of the defects incident to copying from a cast. The doors are of course woodwork (sixteenth century), but there is nothing in the drawing to indicate the difference of material; especially as the jointing of the stonework, which appears in the cast, has been omitted. Apart from this, it is a very careful delineation of a fine and interesting piece of decorative work, in which Gothic and Renaissance elements are curiously mingled.

CEREMONIAL TROWEL AND CASKET.

THIS is an illustration of the trowel, and the casket to contain it, which was used by the King in laying the foundation stone, the other day, of the Royal Naval College at Dartmouth.

The reverse side of the trowel is engraved with the following inscription :—

"I was used by his Majesty King Edward VII. on 17th day of March 1902 at the laying of the foundation stone of the Britannia Royal Naval College, Dartmouth."

A decorative anchor helps to fill up the lower part of the trowel-blade, its lines fitting in more or less into the shape of the trowel at the point.

The trowel is of silver with gold enrichments, and the casket in cast bronze and silver. The figures at the angles represent winged amorini balancing themselves on the crests of waves.

The work was executed by Messrs. Walter Gilbert, S. Hovel, and L. Weingarten, of the Bromsgrove Guild of the Applied Arts, Worcestershire, working under the suggestion and direction of the architect, Mr. Aston Webb.

Trowels and presentation caskets for such occasions are so often mere pieces of shop furniture, that we have pleasure in illustrating one which shows artistic and original character.

The illustrations are from photographs by Mr. T. Lewis, of Birmingham and Bromsgrove.

WALL DECORATION FOR A BATH-ROOM.

THIS design was made by Mr. C. H. Temple for Messrs. Maw & Co., to be executed in the materials manufactured by that well-known firm.

The wall decoration is in tiles, faience, and mosaic; the cornice, architrave, pilasters, and skirting are in modelled faience; the frieze and figure panels are painted tiles; the borders and dado panels mosaic. The whole of the colouring is in shades of mignonette green, with the exception of the mosaic portion, which is in lustres of pale yellow sienna on burnt sienna ground.

RESIDENCES, WEETWOOD, NEAR LEEDS.

THE semi-detached residences illustrated are situated in a wooded district about three miles north of Leeds. Prior to the erection of the houses an old farmhouse, which had been considerably added to from time to time, occupied the site. The building, with the exception of a recent addition at the eastern end, was pulled down, and two new houses erected on the ground upon which the old residence formerly stood, it being a stipulation of the owner that the old frontage lines should be adhered to as far as possible. This accounts to a large extent for the disposition of plan,* and the different levels of the new houses.

The lower stories are faced with herring-bone broached local sandstone, lined internally with brick. In the upper stories the walls are built hollow, the utilised internal linings of brick, and the outer walling built of coursed rubble wallstones from the old demolished building, and coated with cement "rough cast" or "pebble dash," finished a deep vellum colour. The exterior woodwork of the gables, window-frames, and cornices is painted willow green. The roofs are covered throughout with stone, or what are locally known as "grey" slates.

The houses were built by Messrs. Matthew Wilson & Son, of Headingley, near Leeds, and they have been carried out from the designs and under the superintendence of Mr. William H. Thorp, of Leeds.

* Unfortunately the plan did not reach us until too late for publication.

ADDITIONS TO "BISHOPSFORD."

THE drawing shows additions made to a modern house, "Bishopsford," in Surrey.

The materials are yellow stock bricks and green slates, except the large chimney-stack, which is red.

The builders were Messrs. Maides & Harper, of Croydon; and the architect Mr. Halsey Ricardo.

LIVERPOOL INFIRMARY FOR CHILDREN.

THE Liverpool Infirmary for Children, when founded in 1851, was the only provincial hospital devoted exclusively to children. That there was need for such an institution is shown by the fact that in the first ten months 657 out-patients were treated by the medical staff, and that the numbers, with minor fluctuations, have increased year by year to their present enormous proportions, when somewhere about 14,000 new cases, with from 50,000 to 60,000 attendances, are treated annually.

The building first used was a small private house in Upper Hill-street, but within three years, its accommodation proving inadequate, a move was made to a larger house—46, Great George-street. In 1856 the increasing number of patients rendered another migration a necessity, and a house (No. 58) in Hope-street was rented, and room for the first time provided for in-patients.

The charity continued enlarging its sphere of usefulness till, in 1866, the present site was obtained, and on June 23 the late Duke of Saxe-Coburg, then Duke of Edinburgh, laid the foundation-stone of the building which is now being superseded.

In the last year at Hope-street there were seen 4,093 individual out-patients, numbers which increased in the first year at Myrtle-street to about 5,000, with an average of 16,000 or 17,000 attendances.

The year 1878 saw the need for a further enlargement of the out-patient department of the new hospital, and in 1880 the Committee reported that "the attendances reached the extraordinary total of 29,250!" Since then, notwithstanding various devices for reducing the frequency of attendance and the imposing of a limit (first of sixty, then of fifty) to the number of new cases seen on any one day, there has been a steady increase till the maximum was reached in 1898.

The need for a new building is evident when it is considered that not only are twice as many patients seen as fifteen years ago, when the accommodation was then already reported inadequate, but that also the present department forms the ground floor, above which a large ward and the nurses' home are located. The inevitable result of this conjunction was that overcrowding has ensued, and constant outbreaks of diphtheria and other infectious diseases in the hospital have necessitated frequent closing of the whole infirmary, and nearly continuous disuse of one or more wards.

In 1900 a suitable site opposite the hospital, and entirely separated from it by the width of a side street, was by great good fortune obtained, and a new and completely detached building for the sole purpose of the out-patient clinic is in process of erection preparatory to the total demolition and rebuilding of the whole infirmary. After competition the plans of Messrs. Haigh & Thompson, of Liverpool, were accepted by the Committee, and the work is now in progress under their direction.

The new "extern" stands alone, surrounded by streets on three sides, and a public passage on the fourth; it has therefore been possible to obtain light and ventilation on all sides.

The patients' entrance is at the south-west angle of the building, approached from the principal thoroughfare called Mulberry-street, and exactly opposite the infirmary. It opens into a space for the accommodation of perambulators and through this communicates directly with a large waiting-hall. The latter is placed in the centre of the building, and round it are grouped the various consulting, examining, and operating rooms. Near the entrance is a registration-room, adjoining which an isolation-room is provided from which infectious cases can be removed without their re-entering the main building. The dispensary is suitably placed opposite the principal entrance, to the right of which are also conveniences for the women and children. At the north end of the building, next Mulberry-place, is the entrance for the staff, near which the various rooms for doctors and nurses are situated, with lavatories and other conveniences. An ophthalmic room is provided, also a store for splints, &c. At this end of the building are placed the heating cellar in the basement, and on the first floor accommodation for the keeper and his wife, with a small yard.

The building generally is one story high; the waiting-hall, being higher than the adjoining rooms (and above the keeper's yard, which is on the first floor), can therefore be lighted and ventilated on four sides, which is an obvious advantage in getting a blow through. The rooms are to be warmed by hot water, the fresh air passing through the radiators. Provision is also made for admitting fresh air by means of Leather's ventilators.

All windows have opening casements. The various rooms have extract ventilators connected with the trunk in the roof, which is turned into an automatic ventilator fixed in the centre of the ridge to the main roof.

The interior walls are lined with glazed bricks dado high, having round internal and external angles both horizontally and vertically. All the joints at completion will be raked out and finished flush with Parian cement. The wall surfaces above the glazed bricks will be rendered in Portland cement finished with a smooth surface of Parian, which will ultimately be painted in white ripolin. The floors generally are to be paved with terrazzo. The front entrance will have an inclined plane without steps.

All lavatories, sinks, water-closets, &c., will be bracketed from walls, without floor supports. Electric light is to be used throughout.

The building is being built of Accrington red bricks with Darley Dale stone dressings, the roofs being slated.

The architects, Messrs. Haigh & Thompson, of Liverpool, have been able to give the history of this charity through the courtesy of Dr. Hubert Armstrong, the hon. secretary to the Medical Board, and it is from the assistance rendered to them by that Board that they are hoping to produce a building that will be as complete and perfect as any hitherto erected, if it does not excel them.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Lewisham.—Retention of houses on the north and south sides of Engleheart-road, Catford (Messrs. H. and G. Taylor).—Consent.

Dulwich.—A one-story workshop at the flank of No. 10, Crawthew-grove, East Dulwich (Mr. A. E. Mullins for Mr. Baker).—Consent.

Marylebone, West.—A stone portico at the entrance to No. 48, Bryanston-square, St. Marylebone, to abut upon Upper George-street (Mr. C. Young for Viscount Chelsea).—Consent.

St. Pancras, East.—The retention of wood and glass roofs over the area in front of No. 24, Great College-street, Camden Town (Messrs. Charles Goodall & Son, Ltd.).—Consent.

Chelsea.—Two oriel windows at the first, second, and third floor levels, and one oriel window at the first, second, third, fourth, and fifth floor levels, in front of the Swan tavern, Nos. 3, 4, and 5, Sloane-street, Chelsea (Mr. L. A. Withall for Messrs. Roberts & Gilling).—Refused.

City.—An oriel window at the first, second, third, fourth, and fifth floor levels at No. 6, Cheapside, City (Messrs. F. Chambers & Son for Messrs. A. C. White & Co.).—Refused.

Hackney, South.—Three-story buildings on the forecourts of Nos. 206 to 216 (even numbers only, inclusive), Morning-lane, Homerton (Mr. W. Hall).—Refused.

Holborn.—A projecting metal sign at the second-floor level in front of Nos. 252, 254, and 256, Tot-

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tenham-court-road (Mr. G. G. Woodward for Messrs. Norman & Stacey, Ltd.).—Refused.

Holborn.—Wooden letters in front of Nos. 52 and 54, New Oxford-street, Holborn (Messrs. Nash & Hull for Messrs. Brown, Gould, & Co.).—Refused.

Kensington, South.—A studio building at the rear of No 22, Pembroke-road, South Kensington, to abut apon Pembroke-villas (Mr. G. M. Silley for Mr. G. E. Moira).—Refused.

Lewisham.—A porch addition at the Railway Tavern, Catford Bridge, Lewisham (Mr. A. W. Osborn for Mrs. A. Murray).—Refused.

Lewisham.—A building, with a shop on the ground floor, on the north side of Sydenham-road, Lower Sydenham, to abut upon Champion Park (Mr. E. Schneider for Mr. A. Hurst).—Refused.

Peckham.—A building on the south side of Meeting-house-lane, Peckham, westward of No. 80A (Mr. G. D. Stevenson for Messrs. C. Blyton & Sons).—Refused.

Woolwich.—One-story shops on the forecourts of Nos. 1, 2, and 16, Bostall-lane, Plumstead (Mr. W. A. Stratton).—Refused.

Width of Way.

Lambeth, North.—Erection of Nos. 52 and 53, Fitzalan-street, Kennington (Messrs. J. A. J. Woodward & Sons for Mr. J. Ford).—Consent.

Whitechapel.—Two houses on the east side of Tenter-street East, Whitechapel (Messrs. N. & R. Davis).—Consent.

Rotherhithe.—A granary building on the site of Nos. 51, 53, and 55, St. Mary Church-street, Rotherhithe (Mr. E. Crosse for Mr. A. Barber).—Consent.

Space at Rear.

Wandsworth.—Four houses on the north side of Replingham-road, Southfields, Wandsworth, with irregular open spaces at the rear (Mr. D. Matthews for Mr. G. A. Gale).—Consent.

Width of Way and Lines of Frontage.

Lewisham.—A building, with a bay window, on the west side of Doggett-road, Catford (Mr. O. M. Ayrton for Messrs. Eastwood & Co., Ltd.).—Refused.

Mile-End.—A building on the site of Nos. 51, 53, 55, and 57, Devonshire-street, Bethnal Green (Messrs. Jarvis & Richards for Mr. R. Bayly).—Refused.

Width of Way and Space at Rear.

Southwark, West.—Certain deviations from the plans certified by the District Surveyor, so far as relates to the proposed rebuilding of stables and coach-houses on a site at the rear of buildings on the south side of Lant-street, Southwark, abutting also upon John's-place (Messrs. Perry & Reed for Messrs. L. Spackman & Sons).—Consent.

Formation of Streets.

Wandsworth.—Deviations from the plans, sanctioned on February 19, 1901, for the formation or laying out of new streets for carriage traffic on the Totterdown Fields estate, Upper Tooting-road, Wandsworth, so far as relates to an alteration in the position of the street to be named Derinton-road (Mr. R. Robertson for the Housing Committee of the Council).—Consent.

Means of Escape from the Top of High Buildings.

City.—Means of escape in case of fire, proposed to be provided on the eighth story of Cocker's Hotel, Nos. 18 to 21, Charterhouse-square, Aldersgate, for the persons dwelling or employed therein (Mr. E. Haslehurst for Messrs. Wheeler & Warren).—Consent.

Strand.—Means of escape in case of fire proposed to be provided on the topmost story of the western portion of the Constitutional Club, Northumberland-avenue, Charing Cross, for the persons dwelling or employed therein (Mr. E. A. Gruning for the Committee of the Club).—Consent.

Strand.—Means of escape in case of fire proposed to be provided on the topmost story of an addition to Nos. 173 to 179, Strand, and No. 2, Norfolk-street, on the site of No. 3, Norfolk-street for the persons dwelling or employed therein (Messrs. White & Co. for the Law Land Co.).—Refused.

Buildings for the Supply of Electricity.

Southwark, West.—The re-construction in brickwork of a one-story building at the City of London Electric Lighting Co.'s premises, Bankside, Southwark (Mr. F. Bailey for the City of London Electric Lighting Co., Ltd.).—Consent.

Cubical Extent.

Clapham.—An addition to a building at Nine Elms Ironworks, Nine Elms-lane, Battersea, which building and addition will together exceed in extent 250,000, but not 450,000 cubic ft., and be used only for the purposes of a foundry and machine shop (Messrs. Z. King & Son for Messrs. H. Young & Co.).—Consent.

APPOINTMENT OF A SANITARY INSPECTOR.—The Local Government Board has sanctioned the appointment of Mr. W. Williams as a sanitary inspector in the Metropolitan Borough of Bermondsey.

Books.

A History of the Church of All Saints, Northampton. By Rev. R. M. SERJEANTSON, M.A. Northampton: William Mark.

NORTHAMPTON was for several centuries one of the five chief towns of England, and the church of All Saints was its oldest and most important parochial building, and was intimately connected with various striking incidents in English history.

In these pages, however, we must look mainly to architectural particulars, or details relative to the fabric. Such notes, in this instance, are of necessity but brief, for in 1675 there occurred a fierce fire in Northampton, when most of the town was destroyed, and the great church of All Saints almost entirely perished. In the parish register, among the marriage entries of 1675, occurs the pathetic and pregnant entry:—"While the world lasts, remember September the 20th, a dreadfull fire, it consumed to ashes in a few hours 3-parts of our town and chief church."

But little can be gleaned relative to the fabric of the great cruciform church previous to the fire. It is known, however, to have undergone considerable repair or rebuilding in 1232, when the Bishop of Lincoln granted an indulgence to the contributors to the building fund. In addition to the miniature sketch on Speed's map of 1610, the only known drawing of the church previous to the fire is one in Duke Cosmo's "Travels" of 1669. It shows a large cross church, with a central tower that had evidently been much debased by seventeenth century rebuilding. We are glad to notice that Mr. Serjeantson rejects the curious forgery that appeared in all the glory of colours in a local publication issued in 1844 to celebrate the Queen's visit to Northampton on her way to Burleigh House. A picture purporting to be taken from a thirteenth century manuscript, which was as impossible a conception as certain letterpress which affected to give a contemporary account of a State visit of Queen Elizabeth, though both were in reality clumsy frauds, were actually reproduced as genuine in the *Transactions* of the Northampton and Oakham Architectural Society for 1881. The only part of the old church that was incorporated with the new and much reduced church opened in 1680 (save an undercroft or charnel house beneath the chancel) is the central tower, which now stands at the west end. This tower, which had been much damaged by a storm in 1595, is an architectural puzzle. There have been so many alterations and repairs, and the levels of the different floorings so frequently altered, that it is difficult to explain or understand the successive stages of its treatment, or to account for the unusual narrowness of the arches of the basement. The core of the piers is probably Norman, and there are obvious traces of work of the thirteenth, fourteenth, sixteenth, and seventeenth centuries. Mr. Serjeantson is probably wise in not attempting any explanation of his own, but is content to give the somewhat contradictory theories of Mr. M. H. Holding, the Rev. Dr. Cox, and the late Sir H. Dryden.

The church of 1676-80, built on the site of the old chancel, has a square plan, 75 ft. by 70 ft. internal measurement, with a small chancel. To the south and north of the tower are large chambers, the one used for a consistory court and the other for a vestry with library above. The body of the church has a fine central dome supported on four piers. The mouldings and ornaments of the plaster roof are remarkably good, and the proportions have a certain dignity. The work of the new church was accomplished by voluntary contributions all over England. The list of subscribers is preserved, but neither in the vestry books or elsewhere has it been possible to recover the name of the architect. Several guesses have been made, but they are of no authority. A great west portico, of twelve columns, extending along the whole front of the church, was added in 1701.

The original fittings of the new church included a good and well-proportioned chancel screen. A restoration of 1865-6 resulted in the unhappy destruction and removal of this screen. Most of its component parts were worked up into three entrances from the western vestibule into the nave of the church. The Church of All Saints will attract much attention at the Church Congress of next October; it would be well if the churchfolk of Northampton set to work at once to undo this grievous wrong, as far as may be, and to piece together this interesting and handsome screen from its disjointed parts.

The chancel suffered considerable further restoration in 1888, when the original plan was "improved" with doubtful success. The organ, which was placed in a west gallery built for the purpose in 1700 was unfortunately removed to the north side of the chancel in 1883; at that time, we believe, though not stated by Mr. Serjeantson, certain distinctive and good parts of the case disappeared. A more serious point, to our thinking, is the injury which must have resulted to the tone and effect of this grand instrument, from being removed from its central and open position. The author does not seem to be aware that this organ is (or was, if they have not spoiled it), one of the finest and most remarkable church organs in England, with the very unusual feature of *two* great organ manuals of equal scale and power (four manuals in all); an arrangement invaluable in a musical sense, though a very costly one. Archæologists, however, seldom trouble themselves about matters of this kind; indeed, the author's knowledge of the subject may be estimated by the fact that he mentions a considerable sum (about 130*l.*) having been expended in "several new pipes" for the organ: rather expensive pipes! It should of course have been "several stops," *i.e.* complete ranks of pipes. Mr. Thomas Shephard supplies some interesting copies of armorial glass in the old church from the Belcher MSS. of the Bodleian, and has also drawn admirable heraldic head and tail pieces for most of the chapters. Other plates and illustrations are good and useful, but we wish they had included drawings of some of the roof plaster work and details of the demolished screen. Another illustration that we have looked for in vain is that of the memorial statue of the greatest statesman ever connected with Northampton, Mr. Spencer Perceval, England's Prime Minister, shot by an assassin in the lobby of the House of Commons in 1812. A local and national subscription was raised to place a memorial of Mr. Perceval in All Saints' Church. This was accomplished in 1817, and the figure is supposed to be one of the best examples of Chantrey's work. It has since been removed from the church, a matter in regard to which, however, we do not altogether share the author's indignation. It may be questioned whether the church was the proper place for it.

Proceedings of the Incorporated Association of Municipal and County Engineers. Vol. xxvii., 1900-1901. London: E. & F. N. Spon. 1901.

JUDGING from the volumes now issued, the progress of the Association of Municipal and County Engineers has been well maintained. District meetings have been held at various provincial towns, and the subjects discussed included matters of much importance to the community at large. In addition, several useful papers were contributed at the annual meeting, which took place at Leicester under the presidency of Mr. E. G. Mawbey. The general programme followed at the district meetings of the Association is for the local engineer to give some account of municipal work in the town, and then to listen to the remarks and suggestions of his confrères; sometimes other papers are read; and the proceedings usually terminate with a series of visits to works of public interest. There is nothing in this routine differing materially from that adopted by other professional societies. It is reasonable to hope that more beneficial effects may result because all those present are engaged in the same department of engineering work. Consequently, interest in the subjects brought forward is better sustained, and criticism is more searching. As the volume now under review extends to over 360 pages, it is impossible for us to do more than to comment upon a few of the most important subjects dealt with. The meeting at Tonbridge had the effect of demonstrating efficiency rather than magnitude, but, as one of the speakers remarked, it was often possible for engineers to pick up useful wrinkles even from the examples of work presented by small towns. An able and instructive paper was read at the same meeting on "Electricity Supply for Lighting and Tramways, with Special Reference to Small Towns," and another of equal value on the "Main Roads of Kent." The

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visit to Deal afforded to members the opportunity of inspecting the "Case" groynes, whose adoption has saved the Corporation considerable sums formerly necessary for repairing the Marina wall, for underpinning, and repairing roads in the vicinity of the sea. At East Molesey and Hampton the chief subject for discussion was sewage disposal, and as Londoners are largely interested in those places as furnishing a considerable proportion of the water supply to the Metropolis, it is distinctly reassuring to learn that no sewage effluent is better than that from the local beds. In the course of their visit to Oswestry members found many noteworthy improvements, the most interesting, from our point of view, being the extension of the market buildings, which now cover more than 2,000 yards. Several sheets of drawings, showing structural details, are given in the "Proceedings," and these will repay examination. The ancient city of Chichester, visited on another occasion, was productive of admiration for antiquarian relics to the almost entire exclusion of the more prosaic objects of the Association. The annual meeting at Leicester elicited an address from the President, dealing largely with local work, and two most comprehensive papers, one on "Permanent Way for Electric Tramways," and the other on "Methods of Safety for the Overhead Electric Trolley System." Both of these contributions are well worthy of careful attention. The final paper in the volume is devoted to "Asylums or Homes for the Insane," and its chief value is to be found in the records presented of visits to similar institutions in different parts of this country and Germany.

Engineering Chemistry: A Practical Treatise for the use of Analytical Chemists, Engineers, Ironmasters, Ironfounders, Students, and Others. By H. JOSHUA PHILLIPS, F.I.C., F.C.S., Assoc.Inst.C.E. Third Edition. London: Crosby Lockwood & Son. 1902.

THIS is the third edition of a book which has become recognised as a standard work upon the analysis of constructive materials and the valuation of substances used by engineers. The book is divided into the following nine sections:—Part I.—Metals, Alloys, &c. Part II.—Ores, Limestones, &c. Part III.—Fuels, Solid, Liquid, and Gaseous. Part IV.—Water. Part V.—Oils. Part VI.—Materials used in Grease-making. Part VII.—Gasworks Products. Part VIII.—Disinfectants. Part IX.—Explosives.

The volume deals with the analysis of many building materials, but it is somewhat surprising to find no mention of cement, concrete, or mortar, as these materials are frequently used by engineers as well as by builders. The book is of too advanced a character to be of much service to elementary students, but those who have acquired a fairly advanced knowledge of chemical science will find it a useful and reliable work.

In Section VII. the portion dealing with the instructions of the London Gas Referees as to the mode of testing gas for illuminating power needs complete revision, for candles are no longer used as the standard of light, and the bar photometer has been replaced in all the official testing places by the table photometer.

The new matter added in the present edition includes a section upon the microscopical examination of iron and steel, an account of Redwood's apparatus for detecting inflammable vapour in air, and a description of several new methods of testing. We have no hesitation in recommending the book to students of analytical chemistry.

The Municipal Year Book of the United Kingdom for 1902. Edited by Robert Donald. London: Edward Lloyd, Limited, Salisbury-square. Price 3s. 6d.

THIS work has again been enlarged, and it now forms a valuable and comprehensive guide to the municipal government of the country. It is impossible to do more than mention the leading features of the book, which is a model of what such a work should be. A clear and terse account is given of the municipal government of London, in which attention is drawn to the fact that London stands alone in the system of its municipal work, in that a large number of authorities are engaged in managing metropolitan affairs, but with no unity of administrative work. This does not interfere so much with the proper carrying out of municipal government as one might suppose, but it leads to some friction, and, because of the existence of so many authorities, it is less easy in London than in the large provincial towns to effect reforms. The distribution of the chief administrative work of London is indicated, and the names of the officials of the Corporation, the County Council, and of the Borough Councils are given. Very useful sections of the work are: "Municipal Government in England" (being a descriptive sketch of the government and works of large towns, with the population, rateable value, area, names of officials, &c., indicated); "Urban District Councils, England and Wales" (containing particulars of works, names of officials, population, &c.); and "Rural District Councils." The municipal government of Scotland and Ireland is dealt with separately, and in the same clear method by which the municipal government of England is treated, and the work also includes the following useful sections: telephones, water supply, gas supply, electricity supply, tramways, housing of the working-classes, and technical education, these sections in some cases including details of schemes approved or under consideration. The work is well printed and arranged, and, so far as we have been able to test it, it is up to date and reliable. There is a useful index, and no pains have been spared to make it an indispensable work of reference to the municipal government of the country.

The Land and House Property Year Book for 1901. A Guide to Investments in Real Estate. *Estates Gazette* Office.

THIS is the tenth year of issue of this useful compilation, which consists of a list, under alphabetically arranged headings, of sales of property during the year, with indications by lettering of the conditions attaching to the property, whether freehold, copyhold, leasehold, with or without ground rent, &c., &c. The main portion of the book is concerned with London and suburban sales; but many of the principal country sales in the year are included in a separate division of the book. Ground-rent sales are tabulated separately.

Greenwood's Timber and Stone Calculator. J. H. Kerner Greenwood, St. Ann's-street, King's Lynn; and Baxendale & Co., Miller-street, Manchester.

THIS little work is a useful collection of tables and examples that will be found principally of assistance to builders and those who deal with timber by the "Petersburg Standard;" and while possibly some may use it to a slight extent for stonework, we think the authors quite right in putting the word "stone" in such diminutive type as to make it almost unnoticeable. The tables and examples are carefully and thoroughly worked out, and the work will be found useful for its purpose.

The Student's Column.

PART II.—DRAINAGE.

CHAPTER 10.—BENDS, TAPER PIPES, CAST-IRON DRAIN-PIPES, &c.

BENDS.—Inspection chambers are now generally constructed at all angles in main drains, the changes of direction being effected by means of channel bends laid in the bottoms of the chambers. Sometimes, as already stated, the drain-pipes are continued through the chambers, and in these cases access bends, such as that shown in fig. 22, will be required. The access eyes shown in figs. 23 to 25 are also made with bends.

Ordinary drain-pipe bends are made of various degrees of curvature and of various radii. The three most common forms are the quarter bend, the sixth bend, and the eighth bend, which take their names from the proportion of the circumference of a circle which they occupy, exclusive of the socket. Fig. 29 shows the three bends. It will be noticed that the quarter bend subtends an angle of 90 deg. at the centre of the circle, the sixth bend one of 60 deg., and the eighth bend one of 45 deg. The quarter bend is suitable for drains meeting at an angle of 90 deg., the sixth bend for drains at an angle of 120 deg., and the eighth for drains at an angle of 135 deg. These bends are sometimes described as bends of 90 deg., 120 deg., and 135 deg., and also as quick, medium, and slow. The "medium" bend is sometimes one-fifth of the circumference of a circle, and is therefore suitable for drains meeting at an angle of 108 deg. Bends of the same diameter are often made in three sizes, having different lengths of radius, as shown in fig. 30. As the longer bends give an easier curve, they ought always to be selected; short bends, especially quarter bends, retard the flow of sewage to a serious extent. In many cases two large eighth bends or three sixth bends can advantageously be used instead of one quarter bend.

If bends of the proper angle are not obtained, the joints will in all probability be defective. A quarter bend can, of course, be shortened to fit any drain-angle greater than 90 deg., but the pipe may easily be damaged in the operation. A sixth bend can in a similar manner be shortened to fit any angle greater than 120 deg., but if the angle is less than 120 deg., the bend can only be utilised by chipping the sides of the spigot end, and even then the spigot cannot be properly inserted into the socket. The joint, therefore, is certain to be defective. An extreme example is shown in Fig. 31, where a sixth bend is fitted to drains meeting at an angle of 90 deg.

Swan-neck bends (fig. 32) are pipes of double curvature, and are useful for fitting to the outlets of shallow gully traps, in order to take the drain to a suitable depth below the surface. The same result can be obtained by using two ordinary bends, but these necessitate an extra joint.

Lynde's "Loco" deflector bends (fig. 33) are designed for fixing under vertical soil pipes and waste-pipes, the object being to deflect the sewage into the drains with the least possible loss of velocity.

Taper-pipes.—Taper-pipes are of two kinds—enlarging and diminishing. Confusion often arises in ordering these pipes. If we think of the flow of the sewage as it passes from a 4-in. to a 6-in. drain, we shall be inclined to speak of the connexion as an "enlarging" pipe; if, on the other hand, we think of the order in which the two drains are laid, we may regard the connexion as a "reducing" or "diminishing" pipe. To avoid this confusion, it is always best to specify the diameters of the inlet and outlet. At the head of a drain, 4-in. pipes may be shown on the plan until as many branches have been connected with it as can safely be done; before the junction with the next lower branch is reached, the drain must be increased in size, and this can be done by introducing a taper-pipe with a 4-in. inlet and (say) a 6-in. outlet. A similar pipe may also be required at a change from a very steep to a flat gradient. Conversely, a taper-pipe with 6-in. inlet and 4-in. outlet may often be safely introduced to connect a 6-in. inlet drain of small inclination to a 4-in. outlet drain of greater inclination.

Formerly taper pipes were made with the two ends concentric with each other, as will be seen from fig. 34; pipes of this kind, with larger inlets than outlets, could scarcely be laid so that the inverts had a fall in the proper direction. The only correct form for a taper pipe of this kind is shown in fig. 35; the ends of the pipe are at right-angles to the invert, not to the axis. The same form is now adopted for pipes with the outlets larger than the inlets, in order that the inverts of the smaller and larger drains may be in the same straight line, but the advantage in this case is not as great as in the former. Taper bends are also made, but are not often required.

Cast-iron Drain-pipes, &c.

Some of the advantages and disadvantages of cast-iron drain-pipes have already been alluded to. The principal advantages are great strength, increased velocity of flow, absolute imperviousness, perfect joints, true alignment, and the retention of these qualities for a long period of time. The disadvantages are increased cost and liability to corrosion. A further disadvantage, where junction-chambers are not provided, is the increased difficulty of making connexions in the case of alterations to the building.

Against the extra cost of iron pipes may be set a great saving in repairs—stoneware drains seldom remain perfect for any great length of time—and also a small saving in the amount of concrete required. Thus, in London, stoneware pipes under buildings must be completely embedded in concrete at least 6 in. thick, whilst iron pipes need only to be laid on a bed of concrete or otherwise supported on piers,

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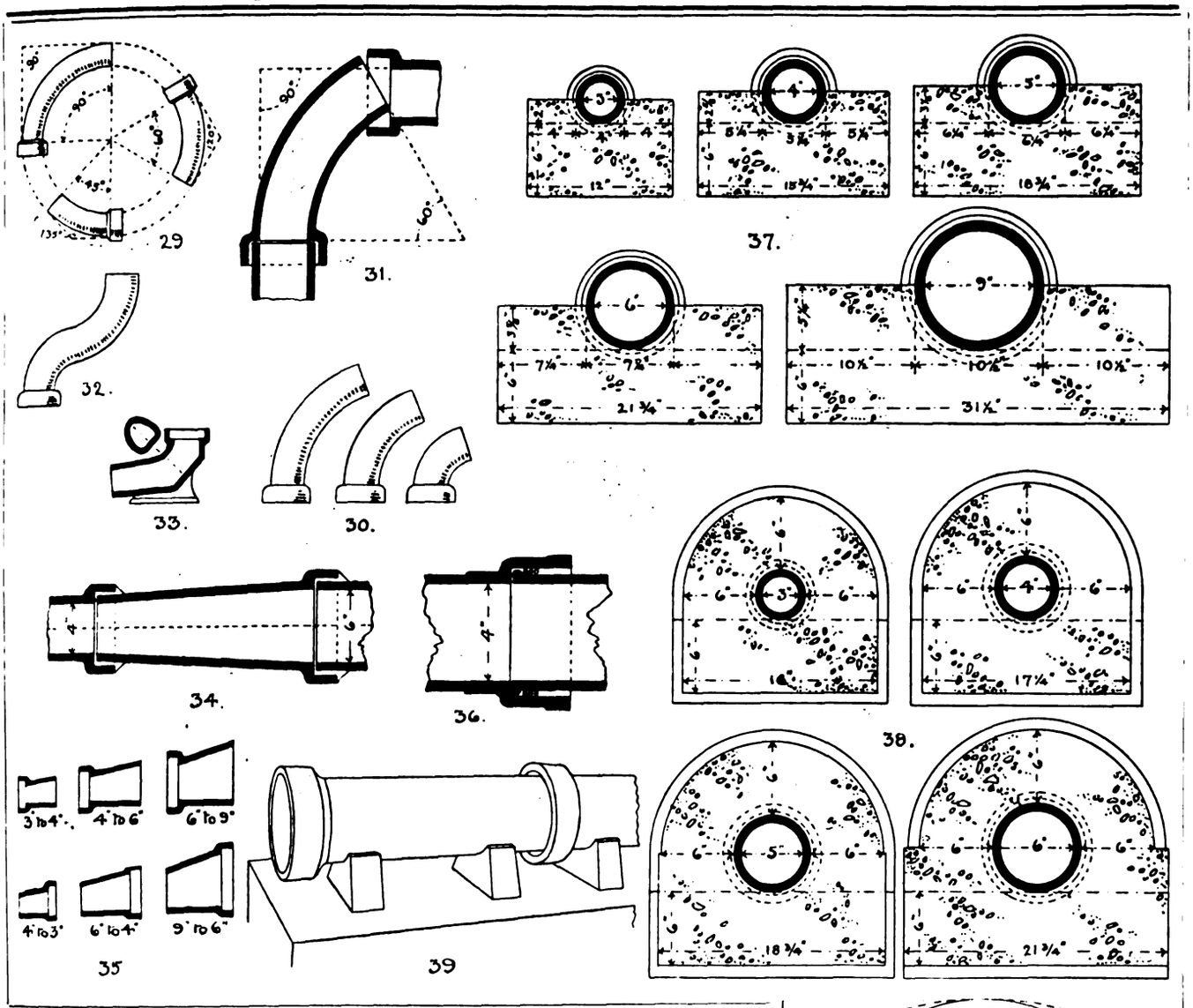


brackets, &c. In many cases iron pipes can advantageously be laid in brick trenches or subways, or supported on piers or brackets, or hung from ceilings. Better gradients can thus be obtained, and the pipes can be inspected, painted, and repaired without difficulty.

It must be admitted that no method of permanently preventing corrosion has yet been invented, but there are various methods of delaying it, and even an unprotected iron pipe may, in insurance language, be regarded as a good life, as the grease in domestic sewage is itself a good preventative of rust. There is certainly much more to be said in favour of iron drain-pipes than of iron soil-pipes.

The most general mode of protection is that known as Dr. Angus Smith's; it is effected by dipping the pipes vertically into a bath containing a mixture of coal tar, pitch, and linseed oil, heated to a temperature of about 400 deg. Fahr. This adds very little to the cost of the castings, and the coating is fairly durable. The Bower-Barff process is seldom used, and need not be described. Glass-enamelling, if properly done, gives a smooth and durable vitreous coating to the interior surfaces of the castings, but unfortunately the coating is not always complete and uniform; the writer has rejected glass-enamelled pipes (supplied by a well-known firm) because patches of iron have been left unglazed, or because the glaze has risen in blisters. Glass-enamelled pipes are costly, but if the enamel is perfect when the drain is laid they may safely be regarded as more durable than pitch-coated pipes. Galvanising is not a good protection; the coating of zinc is not always complete, and at the best it is soon eaten away.

Dimensions and Weights. — The London Drainage By-laws specify the following dimensions and weights of cast-iron drain-pipes:—

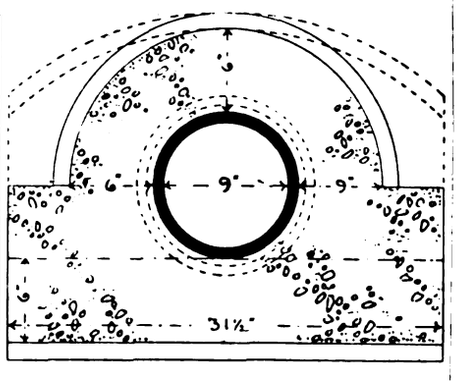
Internal Diameter. Inches.	Thickness of Metal, not less than—	Weight per 9ft. length not less than—
3 ...	$\frac{1}{4}$ of an inch	... 110 lbs.
4 ...	$\frac{5}{16}$ "	... 160 "
5 ...	$\frac{3}{8}$ "	... 190 "
6 ...	$\frac{7}{16}$ "	... 230 "

The weight includes the socket and beaded spigot or the flanges. Sockets must be not less than 2½ in. deep and ⅝ in. thick, and the annular space for the lead used in caulking must be at least ¼ in. wide for 3-in. and 4-in. pipes, and ⅜ in. for the larger pipes. Socket-joints must be made "with molten lead properly caulked." Flange-joints may also be used, and must be "securely bolted together with some suitable insertion." It may be said in passing that socket joints are almost invariably adopted in drainage work.

Lighter and heavier pipes than those required by the L.C.C. can, of course, be obtained, but the lighter pipes cannot be recommended. Pipes are also made in 6-ft. lengths, but these involve more labour and lead in laying than the 9-ft. pipes. Making-up lengths of any size are cast to order.

Joints.—The usual form of socket joint is shown in fig. 36. Three or four turns of gasket are first caulked into the head of the annular space, and the joint is completed with molten lead caulked tight with a proper tool. Sometimes neat Portland cement is used instead of the molten lead; such joints are cheaper and more easily made, but are not as satisfactory. The spigot end ought to have a half-round bead cast on to prevent the caulking material passing through the joint. For cutting pipes, wheel cutters are better than hammer and chisel, as the latter are apt to damage the casting. It is a good plan to shrink a wrought-iron ring on to the cut end of a pipe to take the place of the bead. Turned-and-bored joints are more frequently used for water-mains than for drains. They are an improved form of the socket joint, the inner half of the socket having a smaller diameter than the outer half, and being bored to a true cylindrical surface, and the thickened end of the spigot being turned to fit exactly into the bored part of the socket; the joint is completed with molten lead properly caulked.

Fittings.—Cast-iron junctions, bends, collars, taper pipes, &c., are now made in great variety, but many of them are on the same



general lines as the stoneware fittings already described, and therefore do not call for detailed notice. Cast-iron inspection chambers and manhole fittings will be considered in a subsequent chapter.

Concrete Beds for Drains. — Probably the most common cause of defective drains is insufficient bearing on the ground and consequent settlement due to the weight of the filling material or of passing loads. A circular pipe laid on the flat bottom of a trench is easily forced downwards, unless the ground is extremely firm. Settlement is still more likely to occur if the pipes are supported at the sockets only instead of along the barrels. On taking up old stoneware drains—especially those jointed with cement—it is often found that the collars have been burst off in consequence of such settlement. Hence the necessity for a firm foundation of concrete. The Urban Model By-laws specify that every drain (except subsoil drains and drains under buildings) must be "laid in a bed of good concrete" in order that a firm foundation may be obtained. In the rural by-laws, the concrete bed must be provided only "where necessary." Both the Urban and Rural By-laws require every drain passing under a building "to be completely embedded in and covered with good and

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solid cement concrete, at least 6 in. thick all round."

The London by-laws are more stringent; the thickness, breadth, and composition of the concrete are specified. Every drain (except subsoil drains) must be laid "on a bed of good concrete not less than 6 in. thick, and projecting on each side of the drain to an extent at least equal to the external diameter of the drain." In the case of stoneware drains, concrete must also be "filled in so that it shall extend to the full width of the concrete bed . . . . and so that such drain shall be embedded to the extent of not less than half its diameter." Fig. 37 shows the concrete required for 3-in., 4-in. 5-in, 6-in., and 9-in. pipes, according to these by-laws. In the case of stoneware drains passing under buildings—other than subsoil drains—the pipes must be "completely embedded in and covered with good and solid concrete at least 6 in. thick all round." These "surrounds" of concrete are shown in fig. 38. Strictly speaking, the concrete ought to be 6 in. thick around the sockets of the pipes, as shown by the outer lines in the diagram, but the usual course is to allow 6 in. from the barrels. Sometimes the upper part of the concrete is formed to the shape shown by the dotted lines in the section of the 9-in. drain. An iron drain passing under a building need not be surrounded with concrete, but must be laid on a bed of concrete, as already stated, "unless it be carried above ground, and also be carried at least at each joint on adequate piers or other sufficient supports, constructed of iron, stone, brick, or cement concrete." The concrete is specified "to be composed of clean gravel, hard brick broken small, or other suitable ballast, well mixed with clean sand and good Portland cement in the proportion of two parts of sand, one part of cement, and six parts of other material." These proportions do not give a very strong or an impervious concrete, and may with advantage be improved by altering to 1½ parts of sand, 1 part of cement, and 4 parts of ballast broken to pass a screen with 1-in. meshes.

Hand-holes may be formed in the wet concrete bed to receive the sockets of the pipes and to allow space for making the joints, or—a better plan—the barrels may be supported on stoneware chairs, as shown in fig. 39, these being afterwards embedded in the upper concrete.

Drains under Buildings.—The Model By-laws, both Urban and Rural, specify that drains must not be constructed "so as to pass under any building, except in any case where any other mode of construction may be impracticable." In the exceptional case the drain must be "laid in a direct line for the whole distance beneath such building, and . . . . be completely embedded in and covered with good and solid cement concrete, at least 6 in. thick, all round." Concrete surrounds for drains of different sizes have already been illustrated in fig. 38. The Urban By-laws unnecessarily require the drain "to be so laid in the ground that there shall be a distance equal at the least to the full diameter thereof between the top of such drain at its highest point and the surface of the ground under such building." The same by-laws require "adequate means of ventilation to be provided in connexion with such drain at each end of such portion thereof as is beneath such building." In the Rural By-laws the word "access" is wisely substituted for "ventilation" in the foregoing clause. No difference is made in either of the Model By-laws between stoneware and iron drains.

The London Drainage By-laws insist on the concrete surrounds for stoneware drains; an iron drain, however, need not be surrounded with concrete, but may be laid underground on a bed of concrete 6 in. thick, and at least equal in width to three times the external diameter of the drain,* or may be carried above ground "at least at each joint on adequate piers or other sufficient supports, constructed of iron, stone, brick, or cement concrete." In many cases it is a great advantage to carry the drains above ground; better gradients can be obtained, and the pipes can be easily inspected, painted, cleared, and repaired. The London By-laws require a drain under a building to be laid "where practicable" in a direct line, and adequate means of access must "whenever practicable" be provided at each end of such portion of the drain as is beneath the building. Needless to say, there are comparatively few cases where bends need be introduced, or where the means of access must be omitted. If bends and junctions are absolutely necessary in any drain under a building, access-pipes, fitted with airtight covers, ought to be inserted. If the drain is laid underground the access-pipe must be placed in a chamber, usually constructed of concrete and brick, and finished with an airtight iron cover at the floor-level.

* That is to say, 10⅜ in. wide for 3-in. pipes, 14¼ in. for 4-in., 17¼ in. for 5-in., and 20¼ in. for 6-in.

OBITUARY.

MR. DOOLIN.—We regret to learn of the death, after but two days' illness, of Mr. Walter Glynn Doolin, M.A., of No. 9, Dawson-chambers, Dublin. Mr. Doolin had practised during some considerable period in that city, and was the architect of many Roman Catholic churches, convents, schools, and kindred buildings in the capital and elsewhere in Ireland. Amongst the more important works planned and designed by him we may instance the following:—The parish church, New Ross, for which a tender of Mr. A. Cullen, of New Ross, for 16,300*l.*, was accepted in May, 1895, by the Very Rev. Canon Kavanagh, D.D.; alterations and enlargement of the National Schools in Haddington-road, Dublin, for St. Mary's Church; the schools in Aughrun-street, Dublin; a residence for the Rev. C. F. Ryan at Drangan, Callan, co. Kilkenny; the Church of St. Mary of the Rosary, Nenagh, erected, at a cost of about 25,000*l.* for the fabric, after the style of the Early English period, the details being modelled in accordance with the severer type of the Cistercian abbeys in Yorkshire, and local limestone being used for the exterior structure—we published an illustration of the interior, with a plan, on December 12, 1896; a new church (1897) at Castlemaine, co. Kerry; a Roman Catholic church, dedicated to St. Brigid, at Clonakenny, Roscrea, co. Tipperary (1898-9); rebuilding of the parish church at Doneskea; the belfry, Frankford Roman Catholic Church, Tullamore; the Convent of Franciscans at Merchants' Quay; the Roman Catholic Church at Castlebar, co. Mayo, completed some twelve months ago; and the new church (built upon the site of the former Church of the Holy Cross) at Ardoyne for the Passionist Fathers in Belfast. The foundation-stone of the last-named was laid on June 17, 1900, and the church is noteworthy as being one of the largest in the North of Ireland. The plan comprises a nave, aisles, with large ritual chancel and side chapels, baptistry, Calvary chapel, and Lady chapel, and two western towers (105 ft. high), the extreme measurements are 164 ft. by 68 ft., the interior rising to 52 ft. The style is Romanesque, with a free treatment, based upon that of the Lombardic churches in Northern Italy. Mr. Doolin's designs were selected in competition, upon the award of Sir Thomas Drew as assessor; the contract was taken by Messrs. James Henry & Sons, of Belfast. Mr. Doolin was elected a Fellow of the Royal Institute of British Architects in 1899.

MR. JUDGE.—We have also to announce the death, on the 15th instant, at his residence, No. 5, Frederick-place, Gray's Inn-road, W.C., in his seventy-sixth year, of Mr. George Judge, architect and surveyor. Mr. Judge was elected an Associate Member of the Royal Institute of British Architects in 1848 and a Fellow in 1868. For the trustees acting in terms of the will of the late Mrs. H. M. Burton he was appointed to make the plans and designs for a block of working-class dwellings, for which was taken the site of Nos. 5, 6, 7, and 8, Dove-court, Leather-lane, Holborn.

GENERAL BUILDING NEWS.

CHURCH RESTORATION, ST. BRIDE'S MAJOR, GLAMORGANSHIRE. — The parish Church of St. Bride's-super-Ely, has just been reopened after restoration. The church is situated in a wooded dingle, about 200 yards from the cross road, leading to St. George's from Llandaff and Peterstone. The churchyard is famous for its fine yew tree, the trunk of which is 22 ft. in circumference. The church itself is in the possession of a splendid specimen of Norman work in its south porch removed there from Margam Abbey fifty-five years ago. There is also a beautiful little niche, belonging to the fourteenth century, above the altar, but this, probably, formed part of a monastic building in the near neighbourhood. The chancel arch is a replica of the original Norman work, but, unfortunately, no traces of the original intention have been left to tell their own tale, a fact which applies also to the scale work above the south door; yet, apart from its additions, the church has an individuality of its own—the fourteenth century saddleback tower, the tower arch, and the quaint old monuments form their link with the past. One monumental tablet, in Penarth alabaster, erected to the memory of Captain Jones, bearing date 1658, is of especial interest. The east window was brought from St. Mary, Llanfair. The present work of restoration of the church includes the reparation of the tower, the addition of a vestry, wood-block flooring, re-seating the nave, heating apparatus, and generally putting the whole fabric into a thorough state of repair. The contractors who carried out the work were Messrs. Harries & Davies, the architect being Mr. G. E. Halliday, of Cardiff, the Diocesan Surveyor.—*Western Mail.*

CHURCH FOR EASTBOURNE.—The new Church of St. Michael and All Angels, the erection of which has just been, in part, completed, was dedicated recently. The work is at present only half completed, but there is accommodation for over 400 persons, 250 seats being provided in the temporary iron nave, and the remainder in the chancel and morning chapel. The church is seated with chairs throughout. The architect is Mr. G. E. S. Streatfield, and the builder Councillor M. Martin.

NEW U.F. CHURCH AT LARBERT, STIRLINGSHIRE.—On the 8th inst. Larbert East U.F. Church was opened. The edifice has been built upon the site of the old church. It stands upon the main road from Carron to Stenhousemuir. The area seats 670 and the gallery 180. Mr. James Strang, Falkirk, was architect. The cost was between 6,000*l.* and 7,000*l.*

PROPOSED NEW CHURCH AT MIDDLESBROUGH. It is proposed to build a second church in the parish of St. Aidan's, Middlesbrough. It is to be known as St. Alban's, and plans for the edifice, which is roughly estimated to cost between 4,000*l.* and 5,000*l.*, have been prepared by Mr. F. L. Pearson, of London. The building will provide accommodation for 400 worshippers.

SUNDAY SCHOOL PREMISES, CHESTERFIELD.—On the 10th inst. Dr. George Booth, J.P., opened some new school premises for the Holywell Cross (Primitive Methodist) Sunday School. The total cost of the new buildings is 1,700*l.* The schools have been built by Messrs. Forrest, from the designs of Mr. W. Cecil Jackson, Chesterfield. The new premises will provide accommodation for 500 scholars, and consist of a hall and a suite of classrooms, church parlour, kitchen, storerooms, &c.

SUNDAY SCHOOLS, THURNSCOE, YORKSHIRE.—On the 13th inst. the Bishop of Sheffield opened the new Sunday Schools in connexion with the Parish Church at Thurnscoe. The school is built of red bricks. The main room is 57 ft. long by 35 ft. wide, with two classrooms opening with sliding partitions. These are each 17 ft. by 13 ft. 6 in., and at the rear is a kitchen and a further classroom. The fittings in the interior are of pitch-pine, with a wood block floor. Mr. E. Isle Hubbard, of Rotherham, is the architect, and the builder was Mr. C. Wilson, of Thurnscoe. Messrs. Wright & Son, Sheffield, supplied the heating apparatus. The total cost of the erection is 1,350*l.*

CELLULOID MANUFACTORY, PORT TALBOT, GLAMORGANSHIRE.—Works for the manufacture of celluloid articles are being erected in the Duffryn Valley, Port Talbot. There are twelve separate buildings erected of brick, with slate and galvanised iron roofs. Each building is isolated, on account of the inflammable and explosive nature of the compounds used in the manufacture of celluloids. Some of the buildings are very large, one being 500 ft. in length and 56 ft. in breadth, and another 200 ft. long by 54 ft. wide. The land for the erection of the works covers 16 acres. The works are connected with the Port Talbot railway by means of a siding. The machinery is of modern character, and has been manufactured in France. The designing of the buildings has been entrusted to Mr. Frank B. Smith, C.E., of Port Talbot, and the contractors are Messrs. C. & F. Gaen, Port Talbot.

MILL, ROYTON, LANCASHIRE.—The corner-stone of buildings for the Monarch Mill Company, Longsight, Royton, was laid on the 10th inst. The architect is Mr. F. W. Dixon.

POLICE-STATION AND LIBRARY, CHAPELTOWN, LEEDS.—This building, as mentioned in our last issue, is situated at the corner of Chapeltown-road and Town-street, with a frontage of 103 ft. to Chapeltown-road, and 77 ft. to Town-street. The library and police-station blocks, although adjoining, do not overlap in any way, and are entirely separate and distinct one from another. In elevation, however, they are treated so as to form a connected group of buildings. The site is of irregular shape, and the planning of the rooms to admit of symmetrical proportions has demanded special attention. The library block is two storied where it fronts to Chapeltown-road, and one story only in the rear. The ground floor accommodation comprises entrance-porch, vestibule, hexagon hall, lending library, general reading-room, and ladies' reading-room. On the first floor a gallery and book store is provided over the lending library, and a sitting-room and other accommodation is arranged for the library staff. The basement is utilised for a large store and workroom, also cellarage for the heating apparatus and fuel. The reading-room and the ladies'-rooms are both lofty, and are lighted from the roof by means of lantern lights and clearstory windows. Polished granite columns of the Ionic order divide the large reading-room into bays, and add considerably to the internal architectural effect. Kauri pine will be largely used for the internal woodwork finishings. The Police Station block comprises the Police Station proper; a dwelling-house for the superintendent, and a Fire Brigade Station. The ground floor accommodation of the Police Station com-

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prises the following:—Charge office, superintendent's office, and four cells, with arched vaulted ceilings, and both walls and ceilings walled with glazed brickwork. The cells are entered from a corridor which secures isolation, and which also communicates with the charge office. On the first floor are provided a dayroom, a small kitchen with pantry and larder, four constables' dormitories, and linen store, bathroom, and lavatory. The basement is utilised for the heating apparatus, lamproom, and coals. At the rear of the charge office a corridor conducts to a large open court or exercise ground. The superintendent's house is provided with sitting-room, kitchen, scullery, three bedrooms, bathroom, lavatory, and cellarage. The Fire Brigade department comprises an engine-house with folding doors provided with Fry's patent fittings. It is so planned that stabling for two horses can be erected at the rear of the engine-house, with communicating doors, if afterwards considered desirable. Above the engine-house is a large room of similar size, which can afterwards be utilised for a hay-chamber. The block of buildings is designed in the Elizabethan style. Externally it is faced with local Potternewton wall-stones, with Morley Moor stone dressings, and the roofs are covered with green Tilberthwaite slates The buildings will be heated by "low-pressure" hot water, and a separate apparatus is provided for the library and the police-station respectively. Fresh warmed air will be admitted to various rooms, the outside air passing through heating and ventilating radiators. The vitiated air will be extracted by means of shafts and trunks, communicating in the case of the police-station with a Boyle's air-pump ventilator, and in the case of the library with an aspirating shaft built round the boiler-chimney, the exhaust being accelerated by means of a Blackman fan driven by an electric motor. Mr. William H. Thorp, of Leeds, is the architect of the buildings.

HOSPITAL, LIVERPOOL. — The David Lewis Northern Hospital, Liverpool, was opened on the 13th inst. by H.R.H. Princess *Louise*. It was built at a cost of about 120,000*l*. by the David Lewis Trustees. The new hospital fronts Great Howard-street, and covers a considerable area, including the site of the old hospital. Particular attention has been paid to ventilation, and every ward has been specially constructed with ventilating towers and verandahs overlooking the grounds. The hospital consists of one circular and two rectangular pavilions, each three stories high, and the whole will provide accommodation for 220 patients. The wards are on separate floors, each of which contains twenty-two beds, and is so equipped as to be practically a separate hospital in itself. In addition there are nine apartments for paying patients, and several wards for the isolation and treatment of certain diseases. The appliances include a Swedish gymnasium, fitted up with instruments for recovering the use of limbs stiffened by accident, a complete installation of the Röntgen-ray apparatus, a ward for the special treatment of lupus, an operating theatre, photographic and analysis rooms, and Turkish, Russian, electric, and vapour baths. All the walls and the ceiling of the children's ward are embellished with a series of familiar nursery rhymes. The out-patients' department has a separate entrance in an adjoining street, and is, in fact, distinct from the main building. In the institution accommodation is provided for sixty-six nurses, each of whom has separate quarters. Mr. C. W. Harvey was the architect. The lock, fanlight gearing, and fittings throughout the building were supplied by Messrs. Colledge & Brigden, of Wolverhampton.

NEW BATHS AND GYMNASIUM FOR DUNFERMLINE.—At a meeting on the 14th inst. of the representative committee charged with the erection of baths and gymnasium for Dunfermline, the following estimates for the various works were accepted:—Mason, James Stewart, Dunfermline, 10,166*l*.; joiners, Kinnear, Moodie, & Co., Edinburgh, 5,695*l*.; plumbers, James Inglis & Son, Dunfermline, 3,196*l*.; smiths, Redpath, Brown, & Co., Edinburgh, 2,116*l*.; slater, Robertson, Dunfermline, 652*l*.; plasterer, Cavanagh, Edinburgh, 1,390*l*.; engineers, Lowe & Son, Edinburgh, 1,727*l*.; tile-layers, Allan & Son, Edinburgh, 1,836*l*.; glazier, Lindsay, Edinburgh, 279*l*. The architect is Mr. J. Hippolyte Blanc, Edinburgh.

SCOTTISH LIFE ASSURANCE OFFICES, ABERDEEN.—New buildings are to be erected in Union-terrace, Aberdeen, for the Scottish Life Assurance Company. The building will have a frontage of 66 ft., and extend the whole depth of the site to the lane behind. It consists of four stories, with an attic floor over the front portion. The principal façade is to be carried out in Kemnay grey granite. The architects are Messrs. Sydney Mitchell & Wilson, Edinburgh.

FOREIGN.

FRANCE.—M. Migeon has been appointed curator of the Department of *Objets d'Art* (Mediæval, Renaissance, and Modern) at the Louvre, in place of M. Molinier, who has resigned.——The excavations for the new buildings in connexion with the Bourse have led to the discovery of the foundations of the chapel of the ancient convent of the Filles de Saint-Thomas, founded under Richelieu, as well as some objects of interest belonging to the convent.——The old Hôtel de Ville at Toulon, decorated with sculptures by Puget, is threatened with rebuilding, and the introduction of modern sculpture which will be anything but an improvement to the ancient design.——The Municipality of Corbeil (Seine-et-Oise) has opened a competition for the building of a new town hall.——The Congress of French architects will be held this year at Paris, from Monday June 2 to Saturday June 7.——The Municipality of Paris has opened a public competition for the construction and placing of viaducts to carry the metropolitan railway across the Seine at various points.——The Société Nationale des Architectes Français has given, as the subject for its eleventh competition, "Une Maison Maternelle."——A law passed on the 12th inst., has extended to the works of sculptors, architects, and decorative designers the protection conferred by the law in regard to "Propriété Artistique et Litteraire."——The "Société de Peintres et de Sculpteurs" has opened in the Georges Petit Gallery its third exhibition, which is a very brilliant one. Among its best features are the still-life pictures by M. Jacques Blanche, and a set of fine and powerful sketches of Breton subjects by an English artist, Mr. Brangwyn. M. Henri Martin has shown himself as successful in landscape as he has been in decorative and imaginative design. The exhibition includes also sculpture by MM. Meunier, Camille Lefèvre, Dejean, Desbois, and a "Temptation of St. Anthony" by M. Rodin.

HOLLAND.—A stained-glass window has recently been unveiled in the Anglican Church at the Hague. It was presented by Mr. Seth Low, United States delegate to the Hague Peace Conference. The window, which has four lights, represents Christ, and the allegorical figures of Faith, Hope, and Charity. Below is inscribed, "An American Memorial of the International Conference of Peace, 1899."

MISCELLANEOUS.

GOOD FRIDAY WEEK.—In consequence of the Easter Holidays, next week we go to press a day earlier than usual. All communications for the Editor must reach him by *first post on Wednesday morning*, except lists of tenders, which will be received up to 10 a.m. of the same day.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The London office of the Great Western Potteries and Brick Works has been removed from 11, Queen Victoria-street to 171, Queen Victoria-street, E.C. Mr. F. H. Brook has been appointed London agent for the company.——Mr. H. F. Parshall, consulting engineer, has removed his offices from 8 Princes-street, Bank, to Salisbury House, London Wall, E.C. ——The offices of the Builders' Benevolent Institution are removed from 35 Southampton-row to 31 and 32 Bedford-street, Strand, W.C. —— Mr. Owen W. Davis, architect, has removed from 27, Rutland-street, Hampstead-road, to 41, Pennard-road, Shepherd's Bush, W.

ELECTRIC LIGHTING, NEWCASTLE. — A Local Government Board inquiry was held recently at the Town Hall, Newcastle, by Mr. A. A. G. Malet, M.Inst.C.E., into the application of the Town Council for sanction to borrow the sum of 8,615*l*. for the purposes of electric lighting. Mr. Clirehugh, of the firm of Messrs. Lacy, Clirehugh, & Sillar, consulting engineers, of Manchester and London, submitted a report and estimates of an electric lighting scheme for the borough. There was no opposition to the application.

CO-OPERATORS AND THE HOUSING PROBLEM.—A joint conference of co-operators and trades-unionists, convened by the Committee on Production and the north-western district of the Co-operative Union, was held at Lancaster on the 8th inst. A paper was contributed by Mr. W. H. Brown, of Stratford, London, on "The Next Step in Co-operative Production." The paper advocated the complete industrial independence of co-operation, and mentioned that within the co-operative movement no fewer than seven millions had been spent in housing members. Of the millions advanced to members to purchase their houses practically the whole amount had been paid to private firms, and the question propounded was, "Ought we not seriously to advise co-operators to tackle the building trade?" It was suggested that federated builders' societies might be started in districts where distributive stores are thickly clustered. Just as co-operation had raised the standard of living, so it would raise that of building. Several speakers urged that before such a scheme could be successful an understanding must be arrived at with trades-unionists as to what constituted a fair day's work for a fair day's pay. A reference to the alleged "ca' canny" principle called forth the protests of several workmen's representatives.

A SUGGESTED WORKS DEPARTMENT FOR BRADFORD.—At a recent meeting of Bradford City Council, Mr. A. Tuke Priestman moved: "That it being desirable that the Council should, whenever possible, execute all works required to be carried out by the Corporation without the intervention of a contractor, a Works Department be constituted for the purpose; and that it be an instruction to the Finance and General Purposes Committee to appoint a special sub-committee to draw up a scheme on the model of the London County Council Works Department, and prepare the requisite resolutions for amending the Standing Orders of the Council." Mr. Priestman described the operation of the Works Department in London, and said that it had done all its contract jobs within 2 per cent. of the estimates, and saved some 11,000*l*. on the scheduled value of the works undertaken. Mr. C. L. Robinson seconded the resolution. Mr. H. H. Spencer proposed an amendment to the effect that it be an instruction to the Finance Committee to appoint a sub-committee with authority to obtain all the information possible with regard to the working of the London County Council Works Department. Mr. Spencer said he considered that this was the most important subject that had come before the Council that day. It was most advisable that precise information should be obtained. The resolution meant that the Corporation was going beyond the administration of monopolies into the field of private competitive trading. So far as he had been able to ascertain, the net effect of the operations of the London Works Department was that the jobs had been done at about the same prices as the contractors would have done them; they had done them as well, but no better, and paid the same wages, but not higher. The result was that the contractors' profits had been lost, and something, therefore, had been lost to the country. Mr. Jowett asked if Mr. Spencer would include other places besides London. Mr. Spencer replied that he would include other places, and on the mover and seconder of the resolution agreeing to accept the amendment, it became the substantive resolution and was adopted.

WAKEFIELD CATHEDRAL EXTENSION. — Some interesting discoveries have been made during the past few days in the course of the erection of the extensions at the east end of Wakefield Cathedral. Besides making an extension of the existing chancel, and adding a Lady Chapel still further to the east, vestries and a chapter-house are being constructed below the level of the churchyard. This work had so far progressed that it had become desirable to complete the corridor, which gives access to the chapter-house from the church on the one hand and the churchyard on the other. To do this a large amount of earth which was untouched by the preliminary excavations was removed from about the foundations of the remains of the east end. While this was being carried out a few days ago the workmen came upon some walling, which may have been the foundation of an earlier church on the same site. The wall is of the roughest kind, with wide joints between the stones, and it is consequently very difficult to form any accurate estimate of its age. But its face, which can be traced for about three yards, follows an entirely different line from the perpendicular wall which partly stands upon it, and it is noticeable that the stones are entirely unworked, and that there is not a vestige of the remains of any destroyed building among the stones of this lower walling, while such remains are frequent in the perpendicular wall above. The supposition that the rough wall is of very early date is, therefore, probably well-founded. Close by the remains of an old lime-kiln were found, and actually within the remains of this kiln was a very finely worked stone of Norman date. This stone may either have been a portion of an abacus of a column, or may, more probably, have formed part of a string-course. Only one face is carved, and that bears an admirably-executed design characteristically Norman in character, and very much resembling that on the abacus of a column in the White Tower of the Tower of London—figured and dated A.D. 1080 in "Parker's Glossary of Architecture." There was, it is known from "Domesday Book," a church at Wakefield in Saxon times, and it is believed by Mr. J. T. Micklethwaite, from evidences found in Sir Gilbert Scott's restorations, that it was rebuilt more or less completely "some time in the half-century of which the year 1100 is the middle." This stone is clearly of that date, and while it confirms Mr. Micklethwaite's supposition, it gives an interesting clue to the elaboration of the structure.—*Yorkshire Observer*.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST.—At their recent annual general meeting the governors announced their intention to expend from 8,000*l*. to 9,000*l*. in providing a nurses' home within the hospital precincts, where better accommodation for the nursing staff is urgently needed. The hospital, founded by the efforts of the late Prince Consort, was opened fifty years ago in a range of buildings planned and designed by Ordish after the then uncommon "Queen Anne" style, with a central campanile. The sanatorium was designed by, it is stated, Sir Joseph Paxton.

ROYAL HOSPITAL FOR WOMEN AND CHILDREN.—An appeal is made for contributions towards a sum of 16,000*l*. which is needed to complete the estimated cost, 25,000*l*., of the proposed rebuilding, with an enlargement of the site, of the hospital in Waterloo Bridge-road. The institution was originally founded, in 1816, in Doctors' Commons, whence, seven years afterwards, it was removed to its present situation on land owned by the Duchy of Cornwall. At a meeting of the Court of Governors held a few days ago it was announced that the Duchy of Cornwall had consented to sell the freehold of the new site before the current leaseholds shall have come into its possession.

REBUILDING IN OXFORD-STREET.—We understand that Mr. R. F. Atkinson and Mr. A. J. Gordon

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are the architects, jointly, of the premises which are now being built for Messrs. Warings on the north side of Oxford-street, on the sites of Nos. 164-82 (even), with return frontages to Castle-street East, Winsley-street, and Binstead-street. Meanwhile we may congratulate all parties concerned upon the hoarding that has been erected along the Oxford-street front, and is similar to that which was lately set up before "Gillows," further westwards. It presents an excellent, albeit simple design, appropriate for a temporary wooden structure and embodying plain panels tastefully outlined and coloured, which are undisfigured by any "posters" or similar vulgar placards. We can but hope that so successful an innovation will find many imitators in the future.

MANCHESTER MARKET-STREET AREA.—On Thursday last week the House of Commons rejected by 179 votes against 102 a motion for the second reading of the Bill for carrying out the proposed improvements on the Market-street area, in Manchester. Mr. Crawford Smith moved the rejection of the measure on the ground that it involved a very great principle—which, if approved, might hereafter be extended to other cities—of empowering a syndicate to acquire private property on terms based upon compulsory purchase. Mr. Galloway urged that no private syndicate should be entrusted with what was the obvious duty of a municipality, whilst Sir James Fergusson advocated a reference of the Bill to a Select Committee, representing that it was supported by most of the members of Parliament for Manchester and Salford, as well as by the Corporation and the citizens of Manchester.

THE COURT OF COMMON COUNCIL.—At their half-yearly meeting on Thursday, March 13, the Court accepted the resignation of Mr. Henry Montague Bates, principal clerk of the Public Health Department, to which office he was appointed when the City Commission of Sewers was absorbed a few years ago. Mr. Bates, who retires at the age of fifty-three with a pension of 1,200*l.* per annum, as fixed by the Act for amalgamating the City Commission of Sewers with the Corporation, entered the service of the former twenty-seven years ago, and in course of time became their chief clerk.—The Court resolved to contribute 500*l.* in aid of the funds of the City and Guilds of London Technical Institute at Kensington, to expend 4,000*l.* in buying the freehold site, about 5½ acres, of a recreation ground for the City of London School, towards which purchase old pupils have subscribed 1,850*l.*, and a sum not exceeding 5,800*l.* out of the Sessions House rebuilding fund in the erection of a temporary prison in Old Bailey; they also agreed to the building, at an estimated cost of 24,240*l.*, of a new police-station in Moor-lane, Cripplegate Without. At the same meeting was read, with grateful acclamation, a letter written by Mr. Gerald Buxton announcing his purchase of the manorial rights over Theydon Bois, comprising waste lands along Ivy Chimnies-road with the greater part of Bell Common, and offering the lands to the Corporation as an addition to Epping Forest.

SELL'S DICTIONARY OF THE WORLD'S PRESS.—The issue of this work for 1902 (published by Mr. Henry Sell, 167, Fleet-street, E.C.), contains several interesting articles in addition to the information which one expects to find in a newspaper press guide. Among these we may mention the following, which may prove of interest to our readers:—"Two Centuries of Daily Journalism"; "an illustrated article on the Crown Colonies of the Empire, their Governments, Education Systems, and their Industries"; an "Anecdotal History of Journalism"; "A Glance at the Comic Papers of the Victorian Era;" the year's "Newspaper Happenings," &c. The work has been brought up to date, and is well arranged and edited. The thumb-index gives at once first the index, then the London papers, the English provincial papers, the Irish papers, the Scotch and Welsh papers, the magazines, and, lastly, the Colonial and principal foreign papers. An interesting and useful section of the work is that devoted to British Dominions beyond the seas. In the work particulars are given of every town throughout the British Empire in which a paper is published, together with particulars of the principal papers themselves. In regard to the papers of the British Isles the name is given of every town and village in which a paper is published, the market days, distance from London, &c. The total number of papers in the British Isles is now 2,532; of these London is responsible for 554. The number of magazines is 1,562, while there are 209 quarterly reviews of every kind.

CAPITAL AND LABOUR.

PERTH PLASTERERS ON STRIKE.—On the 10th inst. about thirty of the Perth plasterers came out on strike. Some time ago the master plasterers intimated a reduction of ½d. on the wages of the men, bringing them down to 8d. The result was that the men came out on strike. A compromise was made that the wages would not be reduced till March 10, and the men restarted work on the old terms—8½d. an hour. On the 10th inst., however, the men again came out on strike. A meeting was held in the forenoon, but nothing definite was done.

ARBROATH MASONS' WAGES.—The master masons of Arbroath have had under consideration a request by the men to increase the rate of wages from 8d., as at present, to 8½d. per hour; also to allow the men to cease work at noon on Saturdays during the winter months instead of one o'clock, as at present; to grant an extra ½d. per hour on jobs outside the burgh boundary up to two miles distant, and 1d. beyond two miles. The masters have declined to entertain the request on the ground that the present state of the building trade does not warrant any alteration on the existing arrangements.

LEGAL.

THE LONDON BUILDING ACT:

WINDOWS IN HABITABLE ROOMS.

ON Thursday, the 6th inst., Mr. Haden Corser, at the Worship-street Police-court, gave his decision in the case of eight adjourned summonses which had been taken out by Mr. Arthur Crow, F.R.I.B.A., the District Surveyor of Whitechapel, against Mr. Nathaniel Davis, of the firm of N. & R. Davis, for non-compliance with certain notices served under Section 70 of the Act. The cases were heard by his Worship on February 20 and 27, and on February 28 he made an inspection of the premises. Mr. D. Palmer Andrews, of the Solicitors' Department, London County Council, conducted the case on behalf of the District Surveyor, and Mr. Alexander Glen, instructed by Messrs. Woodcock, Ryland, & Co., appeared for Messrs. Davis.

Mr. Andrews stated that Messrs. Davis were the builders and owners of a row of shops and houses known as Nos. 9 to 27, Short-street, Sandys-row, which were erected during the early part of last year. The original intention, as stated in the notice to the District Surveyor, was to build houses without any basements, but on its being found necessary to make deep excavations in order to obtain a proper foundation Messrs. Davis changed their minds and told the District Surveyor that they intended to form cellars. When the buildings were approaching completion it was found that, instead of cellars, the basements were being fitted as kitchens and sculleries, and that the only provision for lighting the former was by means of pavement lights and glazed sashes in the lower part of the shop-front under the stall-board. Thereupon notices of irregularity were served upon Messrs. Davis on the ground that "the windows to the habitable rooms in the basement were not of the nature and description required by Section 70." Upon the houses being let it was found that the basements were being used as living-rooms, and the present proceedings became necessary. In order to show what the Legislature thought to be a proper method of lighting and ventilating underground rooms, Mr. Andrews drew the attention of the Magistrate to the provisions of the Public Health Act, which required that underground rooms, where separately let as dwellings, should have an open area of 6 ft. wide running the full length of the external wall, and that the level of the ceiling should not be less than 1 ft. above the level of the adjoining ground. These provisions, however, could not be enforced as the rooms were not separately let.

Mr. Crow gave evidence in support of Mr. Andrews' opening remarks. He said that, strictly speaking, there was no window in the rooms at all. The sashes in the lower part of the shop-front were really in the shop, and the light was conveyed to the room below through an opening in the shop floor, the opening being enclosed by a bulkhead formed of thin boards under the stall-board of the shop. Assuming that these sashes could be considered as forming a window, in the room below the superficial area of the glass was only about half of that required by the Act, viz.—11 ft. 10 in. instead of 21 ft. 6 in. The area of the room was 215 ft. The area of the part made to open was 11 ft. 6 in. There were many grounds of objection to the method of lighting adopted. The bulkhead enclosure made it impossible for any direct light to reach the back part of the rooms. Standing in the middle of the room it was impossible to see any window at all. Further obstruction would be caused by the display of goods on outside stall-boards, which was a prevalent custom in the district. The height of the sashes rendered it almost impossible for the tenants to open them, except with the aid of a pair of steps or by a chair placed upon the table. The fastening was 9 ft. above the floor. Except on one occasion he had never seen any of the sashes open. In the case of the two end houses, which also had habitable basements, the open space of 100 ft. required by Section 40 had not been provided. On inspecting the premises in January last he had found that the basement of one of the corner houses was used as a living-room. The range and dresser had now been removed to a room at the rear, which was lighted only by a pavement light.

In reply to Mr. Glen, who contended that this little place was only a scullery, Mr. Crow pointed out that it was 12 ft. square, and being now provided with a range, dresser, and sink, it had all the appurtenances necessary for its use as a living-room. He could not see that the term "scullery," which had been applied to it, rendered it less capable of being used as a habitable room.

Mr. Glen, on behalf of the defendant, said the question was of importance, as other buildings would be affected by the decision in this case. Section 151, under which the Notices of Irregularity were served, referred to the construction of the building. The owner was not responsible for the improper use of the building by the tenant. The basement-rooms in the corner houses were not intended for habitable rooms, and the casual use of such for cooking purposes did not bring them within the Section. He admitted that the rooms in the middle houses were habitable rooms, and contended that the pavement lights were lights in the ceiling.

The Magistrate, interposing, said that a light in the ceiling was not a window. A window was a glazed opening in a vertical wall.

Mr. Glen said if that were the Magistrate's ruling then he must admit they had not got the proper area of light, and the only question left was as to whether the window under the stall-board was a window of or belonging to the basement room, or did it belong to the shop? If the bulkhead was brought up close he could not consider the window as belonging to the room. It was a question of degree as to how far the bulkhead could be placed away from the window. If these windows were windows of the basement-rooms they would enlarge them; otherwise they must abandon the use of the basements as living-rooms. He contended, however, that the windows as constructed satisfied the intentions of the Legislature.

The tenant of No. 9, Short-street was then called, and stated that he was by his agreement debarred from using the basement as living-rooms. He admitted, however, in cross-examination that on the Friday when Mr. Crow called a little extra cooking was being done in the basement. He further admitted that the kitchen on the first floor was used as a bedroom. The range and dresser were moved into the scullery by Mr. Davis's men after Mr. Crow's visit on January 24. The dresser was now used for storing buttons. A blower had been fixed to the range since it was moved, but the range was not used.

The Magistrate, in giving his decision, said the sole question he had to determine was whether the windows came within Section 70 of the Act. The Section required that "Every habitable room shall have one or more windows opening directly into the external air or into a conservatory with a total superficial clear of the sash-frames free from any obstruction to the light equal to at least one-tenth of the floor area of the room, and so constructed that a portion equal to at least one-twentieth of such floor area can be opened, and the opening in each case shall extend to at least 7 ft. above the floor level; but a room having no external wall or a room constructed wholly or partially in the roof may be lighted through the roof by a dormer window. . . . or such room may be lighted by a lantern light," &c., &c.

He had no doubt these rooms were "constructed or adapted to be inhabited," and therefore were "habitable rooms" by definition. They were furnished with a cooking range and dresser, and it was abundantly clear that the rooms were intended to be occupied as living rooms. The method of lighting these rooms was partly by means of pieces of glass let into the pavement and partly by sashes made to open under the stall-board of the shop window. With regard to the former he must decide that they were not windows, as in the absence of any definition in the Act as to the meaning of the word "window," he should adopt the ordinary meaning attaching to it in every-day life, viz., an opening in an external wall. There were three ways in which a room might be lighted—(1) by a window in an external wall; (2) by a dormer window; and (3) by a lantern light. Referring to the drawing, he found that the rooms had an external wall under the pavement, but it could not be said that this wall extended upwards above the level of the ceiling of the room. The sashes under the stall-board of the shop-front could not therefore be considered as windows in the external wall, and he must rule that they were not windows within the meaning of the Section. With regard to the corner houses, which were similar in construction and which had been let upon the understanding that they should be used for storage purposes only, as they had no air space at the rear, but which Mr. Crow had stated in his evidence were used as habitable rooms, it appeared that the range and dresser had been removed to a small room at the back which had no window opening into the external air at all. He must find that these also were habitable rooms and did not comply with the requirements of the Act. He must therefore make the order asked for, viz.: That the notices served by the District Surveyor be complied with within eight weeks, and he would allow six guineas costs.

ACTION BY AN ARCHITECT.

IN the King's Bench Division, on the 15th inst., Mr. Justice Bucknill delivered a considered judgment in the case of Howarth *v.* Gardner and another, the case having been heard before his lordship at the Manchester Assizes.

His lordship, in giving judgment, said the action was brought by Mr. Herbert Howarth, an architect

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and surveyor carrying on business at Morecambe against Mr. John Gardner and Mr. John Scott, proprietors of the Alhambra Palace, Morecambe, to recover 379*l.* The amount claimed was the balance alleged to have been due for professional services in connexion with the erection of the Alhambra Palace. Defendants denied that there was anything due, and counterclaimed for damages for alleged negligence. It appeared that in the summer of 1899 the defendants acquired the West End Market at Morecambe for the purpose of erecting a music-hall above a market. In the course of the erection certain alterations were made, and the building when completed was a theatre instead of a music-hall. The total cost of the building was 25,779*l.*, including 1,579*l.* for electric plant, 1,050*l.* for furniture, &c., and 2,585*l.* for decorations. His Lordship said that, having carefully considered the evidence given at the trial, he came to the conclusion that the plaintiff was entitled to recover from the defendants 1,312*l.*, less 1,160*l.* which had been paid on account. He also was of opinion that the defendants had failed on their counterclaim, and judgment would be, therefore, for the plaintiff for 152*l.* on the claim, and also on the counterclaim, with costs.

ACTION AGAINST THE FINCHLEY URBAN DISTRICT COUNCIL.

THE case of the Finchley Electric Light Co., Ltd., *v.* the Finchley Urban District Council came before Mr. Justice Farwell in the Chancery Division on the 17th and 18th inst.

Mr. C. E. Jenkins, K.C., and Mr. Buckmaster appeared as counsel for the plaintiffs, and Mr. W. H. Upjohn, K.C., and Mr. Chubb for the defendants.

Mr. Buckmaster said the case raised an important question. The relief sought in the action was an injunction to restrain the defendants from cutting the wires of the plaintiff company that stretched across the roads that were within the area of the Urban District Council. The facts were shortly these:—The plaintiff company was incorporated under the Companies' Acts, and formed for the purpose of supplying electric light and power. The company had no Provisional Order from the Board of Trade, and had no sanction whatever from any authority. It was simply a private trading company acting under the powers conferred by the Companies' Acts. It appeared that the defendants obtained, in 1898, a provisional order from the Board of Trade enabling them to supply electricity to the inhabitants of their district, an order which, when the plaintiff company began to work, the defendants had wholly failed to act under. They had taken no steps to avail themselves of the advantages they had got, and there was no firm or person supplying electric light to the inhabitants of Finchley. The plaintiff company was incorporated in 1899, and immediately after its incorporation it set to work to supply electric light to the inhabitants of the district. For this purpose one of the first things they did was to lay mains down Cavendish and Stanhope-avenues which were not vested in the defendants and over which they had no control. The plaintiffs laid the mains down the footpaths adjoining the roads instead of down the middle of the roads, and, having done this, they were met at once by the defendants, who said they declined to take in any of those roads if the mains were laid down in that way. They insisted on the plaintiffs laying the mains down the middle of the roads, and not down the footpaths. It appeared to be an extraordinary objection, but the reason was that the defendants desired, when opportunity arose, to avail themselves of the footpaths. What the defendants had done was not done simply for the purpose of benefiting the inhabitants of the district at all, but they had treated the plaintiff company as rival traders and attempted to do all they could to hinder their enterprise. If he (counsel) showed that from beginning to end the defendants had deliberately attempted to prevent the plaintiff company from carrying on business they would be entitled to an injunction to restrain that wrong being done to them. The plaintiffs further claimed damages. After this question had arisen with regard to a private road, the plaintiffs were in a rather difficult position. They had got to cross a road of the defendant Council, and without the consent of the defendants they were unable to open any roads in their jurisdiction for the purpose of laying their mains. What they did on one occasion was this—they obtained a license to open a road for the purpose of laying a water-pipe, and the water-pipe was laid, but while it was being laid they also laid the electric main. That appeared to have aggravated the defendants extremely, because once the main was laid they could do nothing. The defendants then started proceedings against the plaintiffs to restrain them opening any road in their jurisdiction without giving notice to the defendants of their intention, and a motion was made in that matter asking for that relief. That case was ultimately settled upon the terms that the plaintiffs would give notice before seeking to break open the roads, and each party paid their own costs. That was shortly the effect of the settlement. The provision introduced into those terms was that the plaintiffs should give notice to the defendants before they broke up the roads, so that the defendants might grant the leave, but that the defendants did not certainly intend to do. The result was that the plaintiffs were paralysed in carrying on their business. They could not carry their wires where they ought to be, viz., underground, and it was difficult to carry them overhead, but the plaintiffs carried on their business by putting the wires overhead. In the autumn of last year the plaintiffs proceeded to supply a customer by carrying a wire across a road known as the Regent's Park-road. This was done on September 28, 1901. The defendants objected to this, and gave notice that if any wire was placed above ground or across any street without the express consent of the Council, the Council would recommend forthwith to have the wire removed. In asserting that right the defendants were evidently under the impression that the plaintiff company derived its powers under the Electric Lighting Act of 1888, and if that were the case there might be some ground for their action. But the plaintiffs did not derive any of their powers from this statute at all. Therefore, the wire was stretched across the road, and in due course the customer would have been served with the light, but the defendants, on October 1, had the wire cut in two, and asserted that they would do the same thing to any other wires which were stretched across any other road in their jurisdiction. The result was the present action. A motion was made towards the end of the Long Vacation, which came before the Lord Chief Justice, to restrain the defendants cutting this wire or any other wires across the roads in the defendants' jurisdiction till the trial. That motion was resisted on the ground that the Statute of 1888 gave the defendants the right to prevent the crossing of the roads with the plaintiff's wires, but this defence failed, and the learned judge granted the injunction till the trial. Pleadings were then delivered, and the defendants then asserted for the first time the position that the road across which this wire was stretched was a road the fee simple of which was vested in them. Of course, if that were the case the plaintiffs would at once be defeated, because the reason why they could carry their wires across a road vested in the Urban District Council was because the soil was not vested in them. If the soil was vested in defendants with regard to this road across which this particular wire was stretched, the plaintiffs would be wrong. The dispute in this case turned on the question as to the ownership in fee simple of the Regent's Park-road. The defendants asserted that the fee simple of that road was vested in them as being the road authority for the time being having jurisdiction over it, and by virtue of divers public statutes. The onus of proving that they were the owners in fee of the soil rested on the defendants. *Prima facie* the soil was not vested in the defendants at all. He should leave it to the defendants to establish how they made their title out.

Mr. Upjohn argued that the freehold of the street in question belonged to the defendants, and cited a number of public statutes dating from the seventeenth century, as well as calling the attention of the Court to a number of ancient documents in support of his contention. He submitted that the defendants had the right to prohibit the plaintiff company from taking their wires across the street.

His lordship, after dealing at some length with the points of law involved, said that under the circumstances he must hold that the land in question was acquired and was still required for the purposes of the street, and the plaintiffs therefore had no right to take their wires across that portion of the atmosphere above the piece of land which belonged to the defendant Council without their consent. Therefore the claim for an injunction in respect of that piece of land fell to the ground, but under the circumstances of the claim put forward and the fact that an injunction was obtained by the plaintiffs against the defendants, he thought the justice of the case would be met by directing that there should be no costs. His lordship accordingly directed that the action should be dismissed without costs.

IMPORTANT BUILDING CASE IN THE COURT OF APPEAL.

THE case of *in re* an arbitration between Ford & Co. and Bemrose & Sons, Ltd., and *in re* the Arbitration Act, 1889, came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Mathew, on the 15th and 18th insts., on the appeal of Messrs. Bemrose & Sons, Ltd., from the judgment of a Divisional Court of King's Bench, consisting of Mr. Justice Kennedy and Mr. Justice Phillimore, dated April 30, 1901. The case was reported in the issues of the *Builder* of May 4 and 18, 1901.

Sir Edward Clarke, K.C., the Hon. Alfred Lyttelton, K.C., and Mr. Coventry appeared for the appellants; and Mr. English Harrison, K.C., and Mr. Hudson for the respondents.

Sir Edward Clarke, in opening the case, said this was an appeal from the judgment of the Divisional Court on a special case stated by Mr. Vigers, the arbitrator, to whom certain matters had been referred in connexion with a building contract. The question of law raised by the case was a very important one, although the facts could be shortly stated. The learned counsel then read the special case which had been stated by Mr. Vigers, the material parts of which were as follows:—At some time prior to the date of the contract dated May, 1895, Messrs. Bemrose instructed Mr. Ernest R. Ridgeway, an architect, of Long Eaton, to prepare on their behalf plans for the erection of certain works in Park-street, Canal-street, and Carrington-street, Derby, and to invite tenders for the execution of such works. Mr. Ridgeway prepared the plans and invited tenders upon such plans and certain conditions of contract and bill of quantities, and with such tender furnished a schedule of prices. Such schedule of prices was for the purpose of determining the amount to be paid or allowed in respect of any alterations or deviations from the original plans which might be determined upon during the progress of the works, and the prices in the schedule were the prices referred to in the contract as the prices upon which the contract was based. Messrs. Ford's tender was accepted, and the contract in question entered into between Messrs. Bemrose and Messrs. Ford. The contract followed and incorporated and formed one document with a copy of the conditions of contract upon which Messrs. Ford tendered. The material clauses of the contract provided that the work was to be executed in strict accordance with the requirements of the specifications and drawings to the satisfaction of Messrs. Bemrose or their architect. That "the drawings and specifications are to be considered as equally binding on the contractors who undertake the execution of the work, and if any part is omitted from the drawings and specifications which is usually noted or given or described in them, and which may be reasonably inferred from them as being necessary to properly carry out and complete the works, the same shall be equally binding on the contractors as if it had been specially shown or described. Any alteration of the works contracted for which may be decided upon during their progress must be carried out at prices on which the contract is based, and the value of the alteration or deviation from the original plans, after being so calculated by the contractors and the architect, shall be added to or deducted from the amount of the contract as the case may be, but in no case will any alteration or deviation from the original plans and specifications be allowed to invalidate the contract." The contract provided that all disputes should be referred to arbitration under the Arbitration Act, 1889, and contained a covenant from Messrs. Ford that they would "do and perform the whole of the works required in accordance with the plans and specifications for the erection of the new works, and provide all labour, plant, and materials, &c., of whatsoever kind required, at and for the sum of 10,550*l.*" Messrs. Ford completed the work included in the contract, and on April 1, 1897, Mr. Ridgeway, by his final certificate, certified that there was a balance owing to Messrs. Ford of 1,530*l* 13s. 5d.; but the latter being dissatisfied with it, and other disputes having arisen under the contract, recourse was had to the arbitration clause in the contract. It was alleged before the arbitrator, and the arbitrator found as a fact, that the quantities set forth and stated in the bill of quantities upon which tenders were invited were in material and substantial respects insufficient, and that the actual quantities of the works required to be executed in carrying out the works in accordance with the plans exceeded those in the bill of quantities. It was also alleged before the arbitrator, and found by him to be the fact, that it was a general usage in the building trade that where tenders are invited for the execution of works in accordance with plans, and a bill of quantities is furnished, a person making a tender is not expected to verify the quantities himself, but is expected to assume that the quantities are correct, and to tender upon that assumption; that if such quantities proved to be greater or less than the actual quantities, the price was to be reduced or increased by an amount ascertained and determined by the scale of prices given in the tender as the scale by which payment for extras were to be determined. The arbitrator also found as a fact that Messrs. Ford did not verify the quantities, and tendered and entered into the agreement on the assumption that the quantities were correct. He also found that various alterations of the works contracted for were decided upon during the progress of the works, and that the sum of 3,281*l.* was to be added to the contract price in respect of such alterations and deviations; that the total value of the work executed, at the prices upon which the contract was based, was 13,840*l.*; and that 8,750*l.* had been paid to Messrs. Ford by Messrs. Bemrose.

The questions left to the Court by the arbitrator to determine were—

1. Whether in ascertaining the amount to be paid by Messrs. Bemrose to Messrs. Ford regard was to be had to the aforesaid usage in the building trade.

2. Whether Messrs. Ford were entitled only to be paid the sum of 10,550*l.* mentioned in the contract, with such deductions and additions as were by the contract provided to be made in respect of alterations or deviations from the original plans determined upon during the progress of the work, or

3. Whether Messrs. Ford were entitled to be paid the value of all the works actually executed by them at the prices upon which the contract was based

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and whether such value should be more or less than the sum of 10,559*l.* mentioned in the contract.

The arbitrator certified that if the court answered question 1 in the affirmative, 5,090*l.* remained due to Messrs. Ford; question 2 in the affirmative, 2,303*l.* 10*s.* was due to Messrs. Ford; and question 3 in the affirmative, 5,090*l.* was payable by Messrs. Bemrose to Messrs. Ford.

The Divisional Court answered the questions in favour of the builders (the respondents), holding that the builders had a right to say that they had contracted upon the basis of the accuracy of the representations contained in the quantities forming part of the specifications. The Court held that there had been a breach of that which the builders were entitled to treat as a representation or warranty forming part of the contract, and to the extent to which the warranty was not fulfilled and the builders were damaged, they were entitled to receive compensation. Judgment was accordingly entered for Messrs. Ford & Co., the builders, for 5,090*l.*

The learned counsel said their lordships would see that Messrs. Ford & Co. contracted to do the work described in the plans and specifications for the sum of 10,559*l.*, and there was a proviso that if further work was done above that amount, or work was to be deducted from the contract, then that further work should be estimated for for the purpose of addition or subtraction at the prices which were specified in the bill of quantities. This schedule of prices was not for the purpose of enabling the contract to be made, but was for the purpose of determining the amount to be paid and allowed in respect of any alteration or deviation from the original plans and which might be determined upon during the progress of the work. He submitted that if a builder agreed to do work for a lump sum of 10,559*l.* and got a list of prices, the object of the list being to apply the prices to extras, or to deductions during the work in progress, the contract sum was to be paid subject to increase or reduction by applying those prices to the extras ordered.

Lord Justice Mathew: You say the meaning of that contract is to execute according to the plans without reference to the bill of quantities?

Sir Edward Clarke: Yes, that is my proposition. At least, I do not say "without reference to the bill of quantities." I say that the bill of quantities forms no part of the original contract.

Lord Justice Mathew: You say it is only supplied for the purpose of providing for extras?

Sir Edward Clarke agreed.

Lord Justice Mathew: A tender cannot be made unless the builder knows what he has to do. The architect in some cases takes out the quantities himself, but usually a quantity surveyor or clerk is employed, and he is paid by the building owner.

Sir Edward Clarke: I beg your lordship's pardon.

Lord Justice Mathew: Yes he is. His charges are added in the first certificate given by the architect against the building owner.

Sir Edward Clarke: No. It is included in the amount of the tender, and when the certificate is given, the builder has to pay for the quantities.

Lord Justice Mathew: He gets it from the building owner.

Sir Edward Clarke: No, only as part of his price. He does not get it from the building owner in any sense.

Lord Justice Mathew: The building owner pays for getting the quantities out. I have hitherto understood that a bill of quantities is absolutely indispensable to enable a tender to be obtained

Sir Edward Clarke: There is no doubt that it is necessary the builder should have a bill of quantities in order that he may know what he is expected to do.

Lord Justice Mathew: What he is expected to do! Do you really suggest that any builder would be insane enough to tender upon a plan?

Sir Edward Clarke: The builder, before he tenders, has the bill of quantities. That is for the builder's information in order that he may know what to charge. The builders having the bill of quantities tender for 10,559*l.* Now it was suggested that if it turned out that the quantities were incorrect as against the builders, the builders may charge for the actual work done.

Lord Justice Mathew: You argue that the bill of quantities is to be rejected altogether? You say it is only wanted for the purpose of information as to the extras?

Sir Edward Clarke replied that a distinction must be drawn between the bill of quantities and the prices to be applied to the extra work. He submitted that the Divisional Court had come to a wrong conclusion on the law, and that judgment should have been entered for Messrs. Bemrose.

Mr. Lyttelton, following on the same side, said that the only course open to the builders was to sue upon an express warranty. The misrepresentation in the quantities was admittedly an innocent misrepresentation, and as such formed no cause of action for damages. It had never been pretended by the other side that any new contract had been made in consequence of the misrepresentation. The special case definitely found that there was no special request made by Messrs. Bemrose to the builders to do this work, and they had all along sued upon an express contract, which, of course, negatived an implied contract arising out of the request. Therefore it came to this, that the builders must sue, if at all, upon the representation which they said formed part of the contract, namely, that certain quantities were sufficient to do the work. No injustice would be done to Messrs. Ford & Co. by the construction Messrs. Bemrose sought to put upon the contract.

Lord Justice Mathew: It seems to me that your argument is that the building owner says to the builders, "Plans and specification shall be furnished to you, and I am also aware that bills of quantities will be prepared. All I can contract with reference to them is that my surveyor shall honestly prepare them. I do not make myself responsible for what he does." If any contract is to be arrived at with reference to the quantities it would seem to be a contract of that sort. The building owner did not pledge himself for what was going to be done. He contracts for the plans and specifications, and then you might fairly say the general course of business does not go beyond holding out that the gentleman employed as quantity surveyor will behave honestly in the matter.

Mr. Lyttelton said that that was the duty of the builder to see as to the accuracy of the quantities supplied by the architect. It was absolutely true that the course of business would scarcely permit each builder who was going to tender to bear the cost of preparing the bills of quantities himself, and therefore the custom was that the architect prepared for the builder the bill of quantities. That was a custom which had arisen for the convenience not of the building owner, but of the builder. If the quantity surveyor or architect was fraudulent or negligent, the builder would have a remedy against him.

Lord Justice Romer: I doubt that. I do not think that there is any contract between the builder and the quantity surveyor.

Mr. Lyttelton submitted that the builder would have a remedy in a case of fraud.

Lord Justice Romer: Well, in the case of fraud he might have, but he would have no remedy in a case of negligence.

Mr. Lyttelton thought the builder might have a cause of action against the surveyor if he were guilty of gross negligence, which amounted in equity in some cases to fraud. In the present case no injustice would have resulted to the builders if they had been vigilant, because if they had found out that the quantities were insufficient and the building owners had attempted to enforce it, the builders could easily have defended themselves by having it rescinded on the ground of mutual mistake. If Messrs. Ford had, on finding that the quantities were incorrect, come to Messrs. Bemrose and said they had entered into the contract by mistake, they would have got redress and been put to no loss. But what they did was to attempt to impose on Messrs. Bemrose a contract other than that which they had made, binding Messrs. Bemrose to go on with the work, and then to charge them one-third more than the lump sum they had agreed to pay. In many cases that might be most oppressive, and, indeed, in some cases almost ruinous. The learned counsel did not think that he exaggerated when he asserted that to put such a construction on the contract as the builders sought to put was nothing less than a deliberate and solemn farce.

Mr. English Harrison, on behalf of the respondents, contended that the specification and bill of quantities formed really one document, and that formed the contract. There was an implied warranty that the bill of quantities was correct. It was really an abbreviated specification, because the architect had power to extend the works so far as he thought necessary. The contract was quite an unique production, and, therefore, none of the cases relied upon by his learned friends applied to it.

The Master of the Rolls remarked that the learned counsel's argument seemed to be that the arbitrator could saddle the building owners with the obligation of paying one-third more than the contract price on the ground that the quantities only showed two-thirds of the amount of work required.

Mr. English Harrison submitted that all the documents must be read together, and then there was a warranty or stipulation by the building owners that the quantities were in fact correct. The plans were insufficient to enable the builders to check the bills of quantities.

Lord Justice Mathew: There is no evidence of that.

Lord Justice Romer: You should have got the plans and seen that the quantities were accurate.

Mr. English Harrison said that that point was thoroughly gone into before the arbitrator, and, as the arbitrator had decided the case in the favour of the builders, he might be taken to have found that it was impossible for the builders to check the quantities from the plans before them. He submitted that there was obviously an implied warranty by the building owners that the quantities should not be exceeded. The learned Judges in the Court below thought that must be the result, otherwise there would be the greatest hardship on the builders.

Lord Justice Mathew remarked that there might be a hardship on the building owners as well.

Mr. English Harrison said that the building owners had made a very curious contract in this case, and had given the architect powers which he did not think any other architect had ever had. The contract gave the architect power to extend the works if he at any time thought it necessary. The parties who had been hardly treated in this matter were the builders, because Messrs. Bemrose had got possession of 5,000*l.* worth of their work and materials and did not wish to pay for it.

In the result, the Master of the Rolls, in giving judgment, after stating the facts, said that the point in question did not arise for the first time. It seemed to him that it was the well-ascertained practice for the building owner, who was placing before the builder the materials upon which the work was to be done, to give him the plans and specification, and he generally gave him also the quantities. But it was well understood, and it had been settled in more than one case, that this document—the bill of quantities—whether it was embraced in and made part of one of the other documents—whether in the specification or by a schedule to the contract—or was a separate document altogether, it was not, and was not intended to be, a representation to be acted upon in the sense that it was to be deemed to be a warranty. The most that could be said of it was that it was an estimate which a reasonable person, such as a builder, would probably act upon as being an honest representation made by a skilled person; but beyond that it did not go. In the present case it was made a term of the contract that the person whose tender was accepted must deposit with the architect within fourteen days a priced bill of quantities. So that the builders accepted the obligation of furnishing the bill of quantities. It might be easier for them to put the prices on the quantities sent to them, than it might be to adopt the quantities so sent. But it was part of their obligation to furnish a bill of quantities, and they were not relieved from that obligation because they chose to accept the quantities sent to them by the building owners. That was what occurred in the present case. That being the common sense and business aspect of the case, it could not be pushed beyond that. You could not turn an estimate made for the convenience of all parties into a contract. His lordship thought that the mistake as to the quantities—there being no warranty, and there having been no representation which was not perfectly *bona fide* and honest—was not proper subject matter for a claim for work done thereunder. The work which the builders had done was work done under a contract, and having done it under the contract, and under nothing else, they could not claim under another contract which in point of fact was never made. He thought that the crucial point in the case was that it was a contract for a lump sum. It seemed to him that his learned brothers in the court below were wrong in the view they took of this contract. They seemed to have been imbued with the view that there was an apparent hardship on the contractors who had found themselves bound to spend more money than they had calculated upon by reason of the mistake in the bill of quantities. The answer to that was that it was perfectly competent for the contractors to make their own estimate. He thought that the appeal should be allowed, and the decision of the Divisional Court reversed.

The Lords Justices concurred.

The Master of the Rolls said that the order of the court would be that Messrs. Ford & Co. were entitled only to be paid the sum of 10,559*l.* mentioned in the contract, with such deductions and additions as were by the contract provided to be made in respect of alterations or deviations from the original plans determined upon during the progress of the work. Judgment would accordingly be entered for Messrs. Ford & Co. for 2,303*l.* 10*s.* Messrs. Bemrose were awarded the costs of the appeal and in the court below, and also of the special case which had been stated.

WORKMEN'S COMPENSATION ACT:

"ON, IN, OR ABOUT" THE PREMISES.

AT Brompton County Court on Tuesday, before Judge Stonor, Joshua Milton, a builder's carman, St. Martin's-cottages, St. James'-street, Hammersmith, W., sought to recover compensation under the Workmen's Compensation Act from Messrs. Wiggins & Co., builders' material merchants, &c., Chancellor's Wharf, Queen-street, Hammersmith. The claim had reference to an accident sustained by the applicant whilst in the respondents' employment.

The applicant was not professionally represented, and Mr. R. M. Minton-Senhouse, counsel, appeared for the respondents.

Applicant's case, briefly, was as follows: On September 26 last he was sent by the respondents with a cartload of plaster to the Veronese Works, Putney Bridge, a distance of about two miles. It appeared that while applicant was backing the horse through a gateway the horse swung round, and crushed the man's left elbow against a post close by. Besides a compound fracture of the arm, the applicant sustained shock to the system. Total incapacity was the result, the duration of which was not ascertainable. His average earnings had been 30*s.* a week, and the present claim was for 15*s.* a week so long as the incapacity continued.

Mr. Minton-Senhouse said that he admitted the facts as above, but he submitted that this was a case to which the Act did not apply. The Act

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pplied only to accidents "on, in, or about" the remises. Mr. Minton-Senhouse drew his Honour's ttention to the case of Penn *v.* Miller, in which a arter met with an accident 110 yards away from he place of employment, and it was held that to his case the Workmen's Compensation Act did not pply. In the present case the accident, so far rom being "on, in, or about" the premises, was bout two miles away.

The Judge: I think that is quite clear. If the ccident occurred as stated in the particulars, it is uite clear that it was not "on, in, or about" the uilding, factory, or business premises. The appli- ation must fail.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

20,320.—A TENON-JOINT: *A. Pfeil.*—The tenon and mortise are both tapered in two directions; one part of the latter is wider than the other, and it is also undercut at its sides; for a table the tenon is made upon a frame-bar, fastened to the top, of which an inclined bar engages with a similar bar mounted on the legs; the specification describes various methods of fastening the parts of chairs, tables, &c., together.

20,323.—AN APPARATUS FOR USE WITH BATHS: *J. Nuttall and R. Wilson.*—A bath may be lifted and lowered within a well in the floor by means of a shaft which is driven at the bottom of the well with bevel gearing from a vertical shaft; cross-shafts and bevel gearing enable the former shaft to drive four vertical screws that engage with nuts affixed to the bath; telescopical fittings join the waste and supply pipes to fixed points, respectively, of the service.

20,324.—MEANS OF LIFTING AND LOWERING MAPS, BLINDS, &C.: *A. W. Read.*—A casing is screwed to the wall or framing, and a cord is wound upon a drum with flanges bearing in the back and cover of the casing. A recess in a ratchet-wheel takes the octagonal collar of one of the flanges, and in that flange are holes through which the cord is passed. A removable handle serves for winding the cord, whereof that portion which is on the right-hand side of the flange is gripped by recesses cut in the flange and in the wheel.

20,340. — IMPROVEMENTS IN BRUSHES: *S. H. Crocker.*—In order that a brush shall serve for roughly polishing wood, metals, and so on, the inventor coats the bristles with some abrasive material such as emery, which is glued or otherwise fixed upon the brush.

20,355. — PLATFORMS FOR SCAFFOLDING: *G. Curley.*—Braced end frames for a movable platform slide between uprights, being raised or lowered by tackle hanging from cross bolts at the upper ends of the uprights. Metallic hangers from the frames support a lower platform, and its shoes and struts press against the uprights, in which are tongues for grooves cut in the frame, to which vertical guide-bars are also fitted. A bracket for carrying a corner or end platform has a projecting bar that will engage with a socket in the frame. The scaffold is described as being available for use by bricklayers, brickmakers, and masons, and in lifting and lowering their materials.

20,378. — LIFTING-TACKLE: *G. Averly.* — The pulley-block is adapted for use with mechanism driven by hand or by an electrical motor; a carriage which sustains the pulley-block and motor is mounted on wheels on rails and receives the current through wires; on the motor-shaft is a pinion in gear with an internal spur-wheel running freely upon a shaft that has a worm in gear with the lifting chain-wheel; on the spur-wheel is a pulley which is geared with a band to a pulley running loosely on the shaft of one of the wheels that carry the carriage; the spur-wheel may be turned with a chain and pulley, and either the last-named pulley or the spur-wheel is joined to its shaft with a clutch or is worked with a lever; if the pulley-block is made in one piece with the carriage the spur-wheel is joined by toothed gearing with one, or both, of the carriage-wheels.

20,449. — CONSTRUCTION OF STRONGROOMS AND SAFES: *H. D. Hibbard.*—Manganese steel or some unmachinable metal is used for the casting of the parts whereof the surfaces are then ground. The joints between the parts are not made at their edges or corners. The parts of a safe are fashioned with projections and grooves forming ways for keys, and, after the keys have been inserted, the projections are bound to one another with rings that are shrunk on to them. For a corner joint a round ring and a T-key secure the three projections.

20,453. — CONCRETE FLOORS, CEILINGS, AND BEAMS: *G. A. Wayss.*—For strengthening purposes the inventor uses hoop-iron or other bars and strips, which he joins together with pins, bolts, hooked ends, &c. In one adaptation a floor may be constructed of bundles of hoop-iron strips embedded in concrete about the beams, or of braced concrete beams arranged side by side. For vaulted floors, arched ceilings, curved beams, cornice brackets, and consoles the strips are curved to the shape desired.

20,459.—LAVATORY, BATH, SINK, AND SIMILAR FITTINGS: *R. G. Howson.*—A tubular lift-valve is set within a cylindrical space of the basin, having ports from its lower end, and seated above the waste-pipe, by which means an overflow will be conveyed through an opening in the basin and thence through openings at the top of the valve. Apertures in the capping admit air when the valve is upon its seating, but when the valve is lifted the apertures will be closed with a stem, and siphonical discharge for cleansing purposes ensues over the top of the valve, together with a discharge through the lower openings of the latter. In another form a separated air escape is provided for the capping, the valve being in that case after the rotatable kind: confer also No. 19,775 of 1898.

20,496.—ATTACHMENTS FOR HANDLES, KNOBS, &c.: *H. C. Pruce.*—A three-way passage is fashioned in the neck of the knob, having a hole in line with a series of holes that are drilled in the spindle and a pair of diverging holes that register with the holes in the spindle. When the knob has been put in its place a split peg or pin is driven through some of the holes and its ends through the rest; the pin may be solid, in which case the neck of the knob will have one oblique hole only.

20,528.—A SUBSTITUTE FOR GLUE: *W. Hackel, A. Heinrich, and C. Gumpricht.*—For a liquid adhesive paste an admixture is made of water-glass and borax upon a water-bath, to which are added talc, natron, boracic acid, whitening, dextrin, and a siccative agent.

20,556.—A WATER HEATER: *S. Ewart and W. H. Bennett.*—Below the boiler, which has a draw-off tap and a domed bottom, is set an annular chamber into which open a set of radiating and tapered water pockets that are disposed within a middle heating-space. In a variant form the water pockets are hung from a flat boiler-bottom.

20,560.—A VACUUM SYSTEM OF HOUSE DRAINAGE: *R. J. Sayers and A. C. Smith.*—For maintaining a partial vacuum in the pipes on the house side of the soil-pipe trap, the inventor supplies a bell pump, which is driven with a water-motor, and will draw air from one side of the trap whilst it forces air through a pipe into a drain on the other side of the trap. The vacuum is regulated by means of a standpipe, which is covered with a bell hung from a lever, and working upon a water-sealed trough. The bell will ascend in the event of a rise of pressure in the system, whereupon the lever will strike the lever of a valve, and so start the motor to exhaust the excess of air. The soil-pipe carries a non-return air-inlet valve, and the inventors contrive that the motor shall be put into action whenever water is drawn away, by causing the water for the house-taps to flow through the motor.

20,569.—A FASTENING FOR WINDOW-SASHES: *M. McConnell.*—When the arm, set for engagement with a curved catch, is moved so as to fasten the window, it will press down a spring-mounted block, which will then be lifted behind it, and so secure the arm. A pressing down of a button will liberate the arm. The spring may be set parallelwise with the sash and at a right angle with the holder of the button.

20,572. — PROCESS OF DRYING BLOCKS AND BRICKS OF CEMENT: *P. O. von Krottnaurer.*—After their removal from the press the goods are laid edgewise in the upper space of an annular kiln, supplied with hot gases from a regenerative furnace, which are ultimately drawn away with a fan through a round grating and a chamber; hot air is admitted into the top of the kiln through pipes, open to the air without, which are arranged within a middle pipe through which the hot gases ascend, and the furnace gases are admitted at the beginning of the drying process through a cover on a middle portion of the middle pipe, through which may also be conducted hot air and waste furnace gases. The bricks, as they become dried, give their heat to cold air which flows between the columns that support the casing; fireproof linings of mortar protect the pipes from the heat and flames.

20,623.—HOOKS FOR HOISTING APPARATUS: *E. G. Weddell, J. G. Chamberlain, and R. Player.*—By way of an improvement of No. 23,176 of 1896 in respect of a self-detaching hook for use with shaft cages, the inventors supplement the shear blades that engage with the catch-plate, with a lower pair of catches, so as to lessen the distance through which the hook will fall after its detachment is effected.

20,636.—A REGULATING VALVE FOR DOMESTIC WATER SUPPLY: *D. T. Kenney.*—A casing into which the water-service flows has an outlet that, under normal conditions, is closed with a cylindrical valve, in the crown of which is fitted a relieving valve. The flush passes through apertures near the base of the cylinder in which the valve acts. There is a time-passage above. The relieving valve and the working-stem are connected to a weight inside the cylindrical valve. Two pierced washers upon the stem will be lifted in turn by means of shoulders whenever one lifts the valve for flushing purposes. The liberation of the flushing-lever enables the falling weight to firstly shut the relieving valve, the consequent descent of the washers diminishes the volume of the flush before that valve is ultimately closed.

20,639.—MANUFACTURE OF ARTIFICIAL STONE: *W. Dunkelberg.* — For making blocks free from cracks by means of plungers that are moved up and down, two arm-levers linked to bell-crank levers connect the two plungers, and rollers are mounted upon adjustable extensions of the latter levers for engagement with cams of an especial shape, which are bolted to the faces of a pair of toothed wheels. A simultaneous or varying action of the plungers follows in accordance with the relative positions of the cams, and an adjustment of the extension pieces will cause the plungers to make either one stroke or two strokes as the shaft turns once; by that means pressure can be exerted upon the material from both above and below it with single and double blows at different times.

20,652.—CONSTRUCTION OF SCAFFOLDING: *H. A. Röder.*—Tubes, which constitute the uprights, and are pinned or bolted to one another, are joined together with diagonal and horizontal braces which are clamped about the uprights. Split sockets, fitted with clamping rings and screws, hold the lower ends of the tubes, the sockets being adjusted upon the ground with levelling screws through holes in the base plates. Bars are bolted to the bracing clamps for providing brackets to carry safety boards, platforms, and lifting tackle. To one of the clamps is secured a roof ladder. A temporary roof can be held up by the higher inclined stays. In an adaptation, the construction consists of one row of uprights which are secured to the walls with horizontal bars. The invention is described as being available for use upon sloping ground, and in the interior of a building.

20,674.—ARRANGEMENTS FOR PUBLIC WASH-HOUSES: *D. K. Tullis.*—As a means of drying clothes, and securing ventilation, the inventor furnishes each washing-stall with a corrugated tub and a boiler or copper, of which the conical top has a hinged door; escape of steam from the coppers into the wash-house is prevented by a system of pipes which lead from the domes of the coppers to cross-pipes joined to a main exhaust pipe through which hot or cold air may be conducted; the clothes-horses, carried by rails or wheels, automatically work plates or sliding valves whereby a supply of hot air through distributing-boxes is regulated; an exhaust-pipe draws away moist air, and each clothes-horse, being closed on three sides, constitutes a drying-chamber.

20,732.—STAIRS AND STAIRCASES: *A. R. Robinson.*—Stone, cement mixed with coke-breeze, or other concrete, is employed for building up the staircase, recesses are formed in the steps for taking dovetailed or other battens and detachable treads of which the sections are screwed on to the battens. Dovetailed openings may be made in the sides of the staircases through which the battens can be passed.

20,795.—A COMBINED FASTENER AND ALARM: *J. G. Moser.*—A fastener for window-sashes, doors, and so on, comprises two plates which are pivotted on to a screw and together form a casing. As one attempts to open the sash or door, the turning of the fastener upon its pivot will be prevented by a shoulder, so as to force up a trigger and thereby explode a cartridge. A spring retains the hammer, which is fashioned in one piece with the trigger, in its place as set, but when the hammer is turned through a small angle the spring forces it down on to the cartridge.

MEETINGS.

FRIDAY, MARCH 21.

Architectural Association.—Mr. W. H. Lever on "The Dwellings erected at Port Sunlight and Thornton Hough." 7.30 p.m.

Royal Institution.—Geheimrath Professor Otto N. Witt on "Recent Developments in Colouring Matter." 9 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. W. Spinks on "House Drainage." 7 p.m.

Institution of Mechanical Engineers.—Papers to be read, and discussed collectively:—"Fencing of Steam and Gas Engines," by Mr. Henry D. Marshall; "Fencing or Guarding Machinery used in Textile Factories," by Mr. Samuel R. Platt; "Protection of Lift-shafts, and Safety Devices in connection with Lift-doors and Controlling Gear," by Mr. Henry C. Walker; "Guarding Machine Tools," by Mr. W. H. Johnson. 8 p.m.

Birmingham Architectural Association.—Mr. G. A. Cox on "The B.A.A. Excursion to Burford," illustrated by Mr. J. Ward.

Glasgow Architectural Craftsmen's Society.—Messrs. J. McLeod and A. W. R. Bell on "Prevention of Damp in Walls." 8 p.m.

SATURDAY, MARCH 22.

Architectural Association.—Fourth spring visit, to (1) the Roman Catholic Cathedral, Ashley-gardens, Victoria-street, Westminster, 2.30 p.m.; (2) New Police-station at Cannon-row (New Scotland Yard), 4 p.m.

Sanitary Institute (Demonstration for Sanitary Officers). — Inspection at Beddington Sewage Farm. 3 p.m.

Edinburgh Architectural Association.—Visit to Glasgow under the auspices of the Glasgow Architectural Association.

Royal Institution. — Rt. Hon. Lord Rayleigh on "Some Electrical Developments." VI. 3 p.m.

Dundee Institute of Architecture.—Visit to Leuchars Church and Earlshall.

Hartley College Engineering Society (Southampton).—Mr. D. R. Bennett on "The Construction of Roads and Streets." 7 p.m.

Builders' Foremen's Association.—Monthly meeting, Memorial Hall, Farringdon-street.—7.30 p.m.

MONDAY, MARCH 24.

Surveyors' Institution.—Adjourned discussion on Mr. C. H. Fedells' paper on "The Insurance of Buildings against Fire." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. F. Worth on "Water Supply, Sources of Supply and Distribution." 7 p.m.

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Liverpool Architectural Society (Incorporated).—Mr. W. H. Lever on "Port Sunlight." 6 p.m.

TUESDAY, MARCH 25.

Institution of Civil Engineers.—Papers to be submitted for discussion:—(1) "The Greenwich Footway Tunnel," by Mr. W. C. Copperthwaite; (2) "Subaqueous Tunnelling Through the Thames Gravel: Baker-street and Waterloo Railway," by Mr. Arthur H. Haigh. 8 p.m.

WEDNESDAY, MARCH 26.

Builders' Foremen and Clerks of Works' Institution.—Quarterly Meeting of the Directors. 8 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection of the East London Water Works, Lee Bridge, Clapton. 3 p.m.

Devon and Exeter Architectural Society (Plymouth Devonport, and Stonehouse Branch).—Mr. A. S. Parker on "Building By-Laws."

Edinburgh Architectural Association.—Mr. D. Beveridge on "Sir John Vanbrugh and his Work," illustrated by lime-light views. 8 p.m.

THURSDAY, MARCH 27.

Leeds and Yorkshire Architectural Society.—(1) Mr. J. Starkie Gardner on "Decorative Wrought Ironwork." (2) Election of Officers. 6.30 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 5.—By E. BALLARD (on the Premises).

Dartmouth, Devon.—The Quay, the Castle Hotel, f., p., subject to a rent charge of 35*l.* per annum £4,000

By FRED. W. STOTT (at Rochdale).

Castleton, Lancs.—Dicker Green, Slacks and Moorside Estates, 61 a. 0 r. 1 p., f., p. 2,960

March 6.—By T. MARTIN & SON (at Exeter).

Exeter.—Spicer-rd., Maryland, and a plot of building land adjoining, area 25,300 ft., f., p. 2,500

By E. BUFTON & SON (at Llandrindod Wells).

Llandrindod Wells, Radnor.—The Gorse Farm, 98 a., f., p. 4,050

March 7.—By POWELL & POWELL (at Yeovil).

North Cadbury, Somerset.—Woolston House (Hunting Box) and 2 a. 3 r. 32 p., f., y.r. 47*l.* 1,000

A freehold dairy farm, 45 a. 2 r. 30 p. 2,750

March 8.—By WM. PARLOUR (at Well).

Well, Yorks.—House, blacksmith's shop, and 0 a. 1 r. 12 p., f. 240

House and three fields, 5 a. 2 r. 23 p., f. 525

March 10.—By FRANCIS DOD & CO.

Hackney.—98 and 100, Norfolk-rd., u.t. 59½ yrs., g.r. 8*l.*, e.r. 90*l.* 825

Victoria Park.—3, Dagmar-ter., u.t. 43 yrs., g.r. 4*l.* 10s., y.r. 36*l.* 8s. 240

Bow.—38, British-st., f., w.r. 36*l.* 8s. 460

By HAYDEN & WHEELER.

Crouch End.—Haringay-pk., Holmwood, u.t. 96 yrs., g.r. 8*l.* 10s., y.r. 46*l.* 500

By W. H. HILTON.

Clapton.—126, 130, and 132, Blurton-rd., u.t. 71 yrs, g.r. 12*l.*, w.r. 93*l.* 12s. 780

Hackney.—218, Richmond-rd., u.t. 43 yrs., g.r. 6*l.* 10s., y.r. 40*l.* 515

34, 35, 43, 44, 45, and 46, Warburton-rd., u.t. 44 yrs., g.r. 17*l.* 7s., w.r. 152*l.* 2s. 775

Victoria Park.—79, North-st., u.t. 52 yrs, g.r. 5*l.* 10s., y.r. 30*l.* 310

By J. & W. JOHNSON & CO.

Hackney.—65, 67, 71 to 83 (odd), Weymouth-ter.; also i.g.r. 24*l.* 10s., u.t. 12 yrs., g.r. 56*l.*, w.r. 274*l.* 14s. 830

By Messrs. KEMSLEY.

Stratford.—34, The Green, f., y.r. 36*l.* 350

Leytonstone.—359 and 371, Leytonstone-rd., u.t. 80 yrs., g.r. 10*l.*, w.r. 72*l.* 16s. 580

By ROBINS & LINE.

Abbot's Langley, Herts.—The Causeway House and 1¾ a., f., p. 1,225

March 10.—By FRED. VARLEY.

Finsbury Park.—78, Finsbury Pk-rd., u.t. 65 yrs., g.r. 9*l.* 9s., e.r. 50*l.* 510

59, Gloucester-rd., u.t. 57 yrs., g.r. 12*l.* 12s., e.r. 70*l.* 600

March 11.—By F. E. FERDINANDO & CO.

Old Kent-road.—53, Marlborough-rd., f., e.r. 39*l.* 370

Walworth.—94, Beresford-st., u.t. 69 yrs., g.r. 5*l.* 10s., w.r. 42*l.* 5s. 290

By HUNTER & HUNTER.

Shepherd's Bush.—35, 37, 39, 53, 55, and 57, Westville-rd., u.t. 77 yrs., g.r. 36*l.*, y.r. 108*l.* 1,220

By MAPLE & CO.

Hyde Park.—20, Lancaster-mews (stabling), f., e.r. 30*l.* 650

Hampstead-rd.—75, Oakley-sq., u.t. 41 yrs., g.r. 11*l.*, e.r. 75*l.* 560

Hornsey.—1, Willoughby-rd., u.t. 85 yrs., g.r. 10*l.*, e.r. 65*l.* 650

By ROGERS, CHAPMAN, & THOMAS.

Chelsea.—39, Sloane-gdns., u.t. 83½ yrs., g.r. &c. 10*l.* 5s., p. 5,625

South Kensington.—21, Bolton-gdns., u.t. 70 yrs., g.r. 34*l.* 4s., p. 3,225

March 12.—By BOYCE, EVENS, & CARPENTER.

Limehouse.—9, Blount-st., c., q.r. 19*l.* 19s. 275

Hoxton.—42, 44, and 46, Cavendish-st., u.t. 27 yrs., g.r. 15*l.* 15s., w.r. 156*l.* 18s. 905

246 to 254 (even). Hoxton-st., u.t. 16 yrs., g.r. 35*l.*, y.r. 184*l.* 820

By H. DONALDSON & SON.

Bow.—62, Bloomfield-rd., u.t. 66 yrs., g.r. 4*l.* 10s., y.r. 36*l.* 355

Dalston.—84, Lavender-gr., u.t. 48 yrs., g.r. 5*l.* 5s., y.r. 34*l.* 375

By DRIVERS (Holloway).

Holloway. 13, Bedford-ter., f., q.r. 27*l.* 375

12, Paddington-st., f., w.r. 26*l.* 250

12, Durham-rd., u.t. 56¾ yrs., g.r. 4*l.*, y.r. 24*l.* 385

98, Andover-rd., u.t. 70½ yrs., g.r. 6*l.*, y.r. 30*l.* 250

By ELSWORTH & KNIGHTON.

South Kensington.—54, Cromwell-rd., and 28, Queen's Gate-place-mews, u.t. 54 yrs., g.r. 4*l.*, p. 3,775

By G. HERBERT & CO.

Regent-st.—17 and 18, Little Pulteney-st, u.t. 13 yrs., g.r. 150*l.*, y.r. 335*l.* 6s. 345

By E. HOLSWORTH.

Stoke Newington.—13, Brodia-rd., u.t. 27 yrs., g.r. 6*l.*, e.r. 32*l.* £365

By JAS. HOOD & SONS.

East Ham.—10, 12, 14, and 16, Bartle-av., u.t. 97½ yrs., g.r. 20*l.*, w.r. 140*l.* 8s. 840

By A. DOWELL (at Edinburgh).

Kelso (near), Roxburgshire.—The estate of Sydenham, 146¾ a., y.r. 337*l.* 10,000

March 13.—By ALDRIDGES.

Stone, Kent.—Main-rd., Hillhouse and 3¼ a., f., p. 1,180

1 and 2, Hillhouse-villas, f., w.r. 31*l.* 4s. 340

Upper Caterham, Surrey.—Whyteleafe-rd., f.g.r. 20*l.*, reversion in 80 yrs. 535

Whyteleafe-rd., f.g.r. 12*l.* 10s., reversion in 90 yrs. 310

Ashford, Middlesex.—The Broadway, f.g. rents 32*l.*, reversion in 98 yrs. 718

By BISLEY & SONS.

Rotherhithe.—1 to 4, Elizabeth-pl., f., w.r. 62*l.* 8s. 495

1 to 4, Seven Step-alley, f., w.r. 67*l.* 12s. 500

7 and 8, Elephant-lane, f., w.r. 33*l.* 16s. 260

43, St. Marychurch-st., f., w.r. 20*l.* 16s. 230

20 and 22, Renforth-st., f., w.r. 33*l.* 16s. 320

15 and 16, Hadland-st., u.t. 54 yrs., g.r. 4*l.* 10s., w.r. 58*l.* 10s. 530

14 and 16, Aylton-st., u.t. 92 yrs., g.r. 6*l.*, w.r. 44*l.* 4s. 250

1 to 6, Reed-st., u.t. 48½ yrs., g.r. 13*l.* 10s., w.r. 132*l.* 12s. 1,100

33, St. Marychurch-st., f., w.r. 20*l.* 16s., subject to rent charge of 1*l.* 210

Bermondsey.—48, Keeton's-rd., u.t. 44 yrs., g.r. 3*l.* 10s., w.r. 41*l.* 12s. 350

By H. J. BLISS & SONS.

St. Luke's.—114, Goswell-rd. (S), f., y.r. 55*l.* 1,120

70 to 77, Bastwick-st., f., w.r. 358*l.* 15s. 3,060

Old Ford.—13, 15, 21, and 23, Monteith-rd., f., w.r. 104*l.* 1,095

Victoria Park.—94, Bonner-rd., u.t. 52 yrs., g.r. 8*l.*, e.r. 45*l.* 395

Hackney.—31 and 37, Rutland-rd., u.t. 50½ yrs., g.r. 8*l.*, y.r. 56*l.* 660

By G. BRINSLEY & SON.

Dulwich.—Forest Hill-rd., f.g.r. 48*l.*, reversion in 76 yrs. 1,310

By J. G. DEAN & CO.

Croydon.—60 to 72 (even), Longfellow-rd., f., w.r. 152*l.* 1,660

By FAREBROTHER, ELLIS, & CO.

Maida Vale.—Lanark Villas, i.g.r. 80*l.*, u.t. 48¾ yrs., g.r. 40*l.* 720

St. Leonards-on-Sea, Sussex.—55, Marina, u.t. 80 yrs., g.r. 25*l.*, p. 760

March 13.—By C. C. & T. MOORE.

Hackney.—6, Devonshire-pl., with yard and stabling in rear, f., w.r. 80*l.* 12s. 710

Bromley-by-Bow.—20, 22A, 24, 26, and 28, Furze-street, f., w.r. 150*l.* 2,200

Poplar.—Broomfield-st., freehold chemical works, area 10,800 ft., y r. 97*l.* 1,875

Southwark.—1, 2, and 3, Bear-gdns., area 11,500 ft., f., p. 6,100

Battersea.—24 and 24A, Speke-rd., with yard, stabling, and factory in rear, u.t. 54½ yrs., g.r. 7*l.* 4s., y.r. 45*l.* 400

Old Ford.—1, 3, 5, and 7, Candy-st., f., w.r. 120*l.* 18s. 1,200

Poplar.—302 and 304, Manchester-rd., u.t. 39½ yrs., g.r. 12*l.*, y.r. 60*l.* 300

Limehouse.—43, Brenton-st., u.t. 42½ yrs., g.r. 6*l.*, w.r. 41*l.* 12s. 200

Wanstead.—48 and 50, Mornington-rd., f., y.r. 60*l.* 625

By STIMSON & SONS.

Camberwell.—22A, Lothian-rd. (S), u.t. 67½ yrs., g.r. 5*l.*, w.r. 36*l.* 8s. 215

24 to 40 (even), and 60, Lothian-rd., u.t. 55½ to 59½ yrs., g.r. 41*l.*, w.r. 322*l.* 8s. 2,415

62, Lothian-rd., and 2 and 4, Tindal-st., u.t. 55½ yrs., g.r. 12*l.*, w.r. 94*l.* 18s. 630

25, Tindal-st., f., y.r. 29*l.* 18s. 360

Tindal-st., f.g.r. 4*l.*, reversion in 58½ yrs. 120

7 and 9, Tindal-st., u.t. 57¾ yrs., g.r. 8*l.*, w.r. 59*l.* 16s. 465

54 and 56, Langton-st., u.t. 59¾ yrs., g.r. 9*l.*, w.r. 76*l.* 14s. 455

38 to 46 (even), Leipsic-rd., u.t. 3 yrs., g.r. 14*l.*, w.r. 144*l.* 13s. 125

99, Farmers-rd., u.t. 48¾ yrs., g.r. 3*l.*, y.r. 40*l.* 340

39, 41, and 43, Mosedale-st., u.t. 54 yrs., g.r. 12*l.* 12s., w.r. 83*l.* 4s. 695

42, 48, 50, and 52, Westmacott-st., u.t. 52 yrs., g.r. 10*l.*, w.r. 78*l.* 410

220, 222, and 224, Southampton-st., also i.g.r. 6*l.* 10s., u.t. 30 yrs., g.r. 18*l.*, w.r. 83*l.* 4s. 450

Peckham.—15 and 17, Blakes-rd., u.t. 63 yrs., g.r. 8*l.* 8s., w.r. 46*l.* 16s. 405

122, Commercial-rd., u.t. 71½ yrs., g.r. 5*l.*, w.r. 32*l.* 10s. 250

107 to 113 (odd), Gordon-rd., u.t. 65½ yrs., g.r. 20*l.* w.r. 117*l.* 985

31 and 33, Nunhead-green, u.t. 63 yrs., g.r. 8*l.*, w.r. 56*l.* 12s. 455

Norwood.—39 and 45, Thurlow-hill, f., w.r. 67*l.* 12s. 680

Streatham.—187 and 189, Eardley-road, u.t. 77¾ yrs., g.r. 7*l.*, w.r. 41*l.* 12s. 335

South Lambeth.—77, Trigon-rd., u.t. 23¾ yrs., g.r. 4*l.*, y.r. 32*l.* 250

Barnes.—Railway-st., f.g.r. 6*l.*, reversion in 83 yrs. 130

111 and 113, Railway-st., f., w.r. 41*l.* 12s. 400

Raynes Park.—Kingston-rd., a plot of building land, f., p. 170

Richmond-rd., a plot of building land, f., p. 120

Upton Park.—43 to 49 (odd), Redclyffe-rd., f., w.r. 88*l.* 8s. 860

Selscon-rd, two corner plots of building land, f., p. 155

Plaistow.—20 and 22, Ann-st., f., w.r. 44*l.* 4s. 470

By VENTOM, BULL, & COOPER.

Hampstead.—23, Lancaster-rd., u.t. 99¼ yrs., g.r. 25*l.*, p. 1,100

By WM. WESTON.

Dulwich.—22, Tyrrell-rd., (S.), u.t. 74 yrs., g.r. 7*l.*, y.r. 30*l.* 300

Maida Vale.—48, Sutherland-av., u.t. 61 yrs., g.r. 10*l.*, y.r. 75*l.* 660

By HENRY HENDRIKS (at Birmingham).

Stetchford, Worcester.—Albert-rd, Sherwood House, u.t. 92 yrs, g.r. 5*l.* 10s., p. 450

Birmingham.—13, Summer-lane, also the White Horse Inn and four cottages in rear, f., w.r. 116*l.* 14s. £1,730

March 14.—By DAVID J. CHATTELL.

Chislehurst.—Lower Camden, Little Langton, f., y.r. 80*l.* 970

Lower Camden, the Woodlands, f., y.r. 70*l.* 840

Lower Camden, the Cottage, f., y.r. 60*l.* 1,000

By W. A. BLAKEMORE.

Westminster.—10, 12, and 14, Ponsonby-pl., u.t. 23¾ yrs., g.r. 18*l.*, w.r. 209*l.* 6s. 950

Barnes.—Lonsdale-rd., Scipio Villa, u.t. 50 yrs., g.r. 10*l.*, e.r. 50*l.* 335

Bayswater.—16, Northumberland-pl., u.t. 44 yrs., g.r. 6*l.* 10s., y.r. 48*l.* 475

Rotherhithe.—16 and 18, Rotherhithe New-rd., u.t. 46 yrs., g r. 7*l.* 10s., w.r. 65*l.* 430

By HENRY CHAPMAN & CO.

Shepherd's Bush.—96, St. Stephen's-av., f., y.r. 28*l.* 515

46, St. Stephen's-av., u.t. 51¼ yrs., g.r. 10*l.*, e.r. 45*l.* 330

Bethnal Green.—509 and 511, Cambridge-rd. (S.), f., y.r., 80*l.* 1,405

517, Cambridge-rd. (S.), f., y.r. 40*l.* 700

Maidstone, Kent.—46 and 48, King-st., f., y.r. 35*l.* 540

Shepperton, Middlesex.—Green-lane, f.g.r. 7*l.* 10s., reversion in 96 yrs. 190

By SCOBELL & LAKE.

Paddington.—56, Harrow-rd. (S.), u.t. 37 yrs., g.r. 10*l.*, y.r. 65*l.* 600

42, Southwick-st. (S.), and 15, Southwick-mews (slaughter-house, stable, &c.), u.t. 28 and 30 yrs., g.r. 17*l.*, y.r. 100*l.* 970

Notting Hill.—104, Portobello-rd., u.t. 41 yrs., g.r. 6*l.*, y.r. 32*l.* 315

Contractions used in these lists.—F.g.r. for freehold ground-rent; gdns. for gardens; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 11 6	per 1,000	alongside, in river.
Rough Stocks and Grizzles	1 9 6	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 5 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depot.
Red Wire Cuts ..	1 12 0	,,	,, ,,
Best Fareham Red	3 12 0	,,	,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,,	,,
Do., Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 5 6	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers..	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers..	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.
Thames and Pit Sand	7	8a	3 per yard, delivered.
Thames Ballast	6	0	,, ,,
Best Portland Cement	32	0	per ton, delivered.
Best Ground Blue Lias Lime..	25	0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. od. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dep.

STONE.

	s. d.		
Ancaster in blocks	1 11	per ft. cube,	deld. rly. depot.
Bath ,, ...	1 7	,,	,,
Farleigh Down Bath ..	1 8	,,	,,
Beer in blocks	1 6	,,	,,
Grinshill ,, ...	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks..	2 4	,,	,,
Red Corsehill ,,	2 5	,,	,,
Closeburn Red Freestone	2 3	,,	,,
Red Mansfield ,,	2 4	,,	,,
Hard York in blocks ..	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup)	2 8	per ft. super.	at rly. depot.

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PRICES CURRENT (*Continued*).

STONE.

		s. d.	
Hard York,	6 in. Rubbed Ditto..	3 0	per ft. super, at rly. depot.
,, ,,	3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,,	2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks		2	3 per ft. cube. deld. rly. depôt.
,, ,,	6 in. sawn both sides landings	2	7 per ft super. deld rly. depôt.
,, ,, ,,	3 in. do.	1	2½ ,, ,,

SLATES.

in.	in.	£ s. d.	
20×10	best blue Bangor..	12 0 0	per 1000 of 1200 at rly dep.
,,	best seconds ,,	11 10 0	,, ,,
16×8	best ,,	6 15 0	,, ,,
20×10	best blue Portmadoc	11 5 0	,, ,,
16×8	best bluePortmadoc	6 0 0	,, ,,
20×10	best Eureka unfading green....	12 2 6	,, ,,
16×8	,, ,,	7 5 0	,, ,,
20×10	permanent green	10 5 0	,, ,,
16×8	,, ,,	5 17 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles..	41 6	per 1,000, at rly. depôt
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	14 10 0	16 0 0	
Deals: best 3 by 9.....	13 10 0	15 0 0	
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	10 10	11 10 0	
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.	
Deals: seconds	1 0 0	less than best	
Battens: seconds	0 10 0	,, ,, ,,	
2 in. by 4 in. and 2 in. by 6 in. ..	8 10 0	9 10 0	
2½ by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0 0	
Foreign Sawn Boards— 1 in. by 1½ in. by 1½ in.	0 10 0	more than battens.	
¾ in.	1 0 0	,,	
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Swedish balks.....	2 15 0	3 0 0	
Pitch-pine timber (30 ft.).....	3 0 0	3 10 0	

JOINERS' WOOD. At per standard.

White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
,, ,, 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens.....	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.....	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens.....	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.....	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens.....	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 0 0	15 0 0
,, ,, 3 in. by 9 in.	13 0 0	14 0 0
Battens.....	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
,, ,, 3 in. by 9 in.	12 0 0	13 0 0
,, ,, battens.....	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes..	32 0 0	34 10 0
Broads (12 in. and up).....	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small ,, ,, ...	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
¾ in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 12
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube.....	0 3 0	0 3 6

Prepared Flooring— Per square.

1 in. by 7 in. yellow, planed and shot.....	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched.....	0 13 6	0 17 6

PRICES CURRENT (*Continued*).

WOOD.

Prepared Flooring—	Per square. £ s. d.	£ s. d.
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	0 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Common Bars.....	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars.....	9 0 0	9 10 0
Hoop Iron, basis price.....	9 5 0	9 15 0
,, ,, galvanised.....	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.....	10 0 0	- - -
,, ,, to 24 g.....	11 0 0	- - -
,, ,, to 26 g.....	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft to 20 g.....	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.....	14 0 0	- - -
Sheet Iron, Galvanised, flat, best quality :— Ordinary sizes to 20 g	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.....	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 10 0	10 0 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 5 0	- - -
Pipe in coils	14 15 0	- - -
Soil Pipe.....	17 5 0	- - -
ZINC—Sheet— Vieille Montagne..... ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet..... per lb.	0 1 0	- - -
Thin ..... ,,	0 1 1½	- - -
Copper nails..... ,,	0 1 1½	- - -
BRASS— Strong Sheet..... ,,	0 0 11	- - -
Thin ,, ... ,,	0 1 1	- - -
TIN—English Ingots..... ,,	0 1 3	- - -
SOLDER—Plumbers' ..... ,,	0 0 6½	- - -
Tinmen's ..... ,,	0 0 8	- - -
Blowpipe ..... ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths.....	3d. ,, ,,
26 oz. thirds	4½d. ,, ,,
,, fourths	4d. ,, ,,
32 oz. thirds	5½d. ,, ,,
,, fourths	5d. ,, ,,
Fluted sheet, 15 oz.	3d. ,, ,,
,, 21 ,, ...	4d. ,, ,,
⅛ Hartley's Rolled Plate	2d. ,, ,,
⅜ ,, ,, ,, ...	2½d. ,, ,,
½ ,, ,, ,, ...	2¾d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes.....	per gallon	0 2 4
,, ,, ,, in barrels	,,	0 2 10
,, ,, ,, in drums	,,	0 3 0
Boiled ,, ,, in pipes	,,	0 2 11
,, ,, ,, in barrels	,,	0 3 0
,, ,, ,, in drums	,,	0 3 2
Turpentine, in barrels	,,	0 2 6
,, in drums	,,	0 2 8
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	,,	20 10 0
Best Linseed Oil Putty	per cwt.	0 8 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work ..	0 16 6
Best Elastic Copal Varnish for outside work ..	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work.....	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work.....	0 16 0
Best Hard Copal Varnish for inside work.....	1 0 0
Best Hard Carriage Varnish for inside work....	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

J. S. M., W. S. (Amount should have been stated.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor

TENDERS.

*** Next week communications for insertion under this heading must reach us *not later than 10 a.m.* on Wednesday, as, owing to the Easter holidays, we go to press a day earlier than usual.

* Denotes *accepted*. † Denotes *provisionally accepted*.

ABERDEEN.—For the erection of a church, Bieldside, for the Vestry. Mr. Arthur Clyne, architect, 123½, Union-street, Aberdeen. Quantities by architect:—

Masonry.—F. Morrison, Culter, Aberdeenshire*	£2,724 16 6
Carpentry.—Hendry & Keith, Aberdeen* ..	
Plumbing.—Blackie & Sons, Aberdeen* ..	
Slating.—A. E. Merson, Aberdeen*	
Plastering.—A. Stephen, Aberdeen*.....	
Painting and Glazing.—E. Copland, Aberdeen*	

BRADFORD.—For the extension of Rawson-place markets, for the Corporation. Messrs. T. C. Hope & Son, architects, 23, Bank-street, Bradford:—

Masonry.—Obank & Sons, Bradford	£14,868
Ironfoundering. — Taylor & Parsons, Bradford	2,481
Plastering.—Crabtree & Berry, Bradford	565
Plumbing.—Albert Ross, Shipley.....	1,560
Slating.—W. H. & E. Walton, Bingley	322
Roofglazing of Market Hall.—Helliwell & Co. Ltd., Brighouse.....	495
	£20,291

BROTHERTON (Yorks).—For the execution of works and materials to be supplied in and about the laying and jointing of 3,500 lineal yards or thereabouts of earthenware pipe sewers and cast-iron pipes, the construction of manholes, lamp-holes, flushing tanks, and all other appurtenances, the construction of boundary fence to works, tank, filtration areas, pumping-house, storage tank, &c., in connexion therewith, for the sewerage and sewage disposal of Brotherton, in the West Riding of the County of York, for the Pontefract Rural District Council. Mr. John Waugh, C.E., Sunbridge Chambers, Bradford:—

H. Tyson	£6,759 0	Egan & Sons	£4,717 0
J. H. Bentley ..	5,971 0	Ward & Tetley ..	4,498 0
Milson Dixon....	5,345 0	E. W. Ives.....	4,367 10
Jones Bros.....	5,310 0	Wm. Sutcliffe,	
H. Dawson.....	4,961 0	Sowerby Br.*..	4,300 0
Walter Binns....	4,780 0		

BUNCRANA.—Two houses, Cockhill-road for Mr. P. Porter. Mr. J. P. McGrath, architect, 28, Carlisle-road, Londonderry:—

H. Campbell	£600	R. Colhoun, Londonderry*	£420

CARDIFF.—For the erection of a public convenience, Canton, for the Corporation. Mr. W. Harpur, C.E., Borough Engineer, Cardiff. Quantities by Borough Engineer:—

W. T. Morgan	£242	F. J. Robbins.....	£236
F. Waterman	239	Price Bros	223
Melhuish Bros.	238	Knox & Wells*	221

[All of Cardiff].

CARLISLE.—For the erection of two stone bridges, Longtown, for the Rural District Council. Mr. Jas. Murray, surveyor, The Courts, Carlisle:—

Murray & Son, Stapleton, Brampton	Raysburn Bridge....	£211 2 8	
	Bog Burn Bridge ..	168 10 5	
		£379 13 1	

[Surveyor's estimate, £380.]

DARTFORD.—For the supply of granite kerbing, &c., for the Urban District Council. Mr. W. Harston, surveyor, 8, Hythe-street, Dartford:—

Paving Works on the Brent.

T. Adams.....	£277 0 0	The Patent Victoria Stone Co.	£245 1 4
W. H. Wheeler	265 7 0		
W. Thair.....	260 0 11	Gibbs & Co.,	
Wallace & Inns	246 17 0	Ilford Wharf,	
A. T. Catley ..	246 0 0	Ilford, Essex*	239 10 0

Paving Work in St. Alban's-road.

W. H. Wheeler..	£75 0 0	Wallace & Inns	£43 10 0
Thomas Adams..	67 0 0	A. T. Catley	36 0 0
Gibbs & Co.	58 10 0		

W. Thair, Salisbury-road, Bexley*, 1s. 4½d. per yd.

EAST STANLEY (Durham).—For the erection of school buildings, for the Tanfield U. D. School Board. Mr. W. H. Bendle, architect, 33, Grainger-street West, Newcastle-on-Tyne. Quantities by architect:—

G. T. Manners ..	£3,093 0	A. Routledge....	£2,850 0
Reay & Sons	2,910 0	E. Taylor, Durham*.....	2,785 3
A. & R. Davis ..	2,863 14		

[*See also page 305.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Proposed Public Offices	Aldershot U.D.C.	100*l.*, 75*l.*, and 50*l.*	Mar. 29
*Accident Hospital	Mexborough Montagu Hopstal	25*l.*, 10*l.*	May 1
*Memorial to the Queen Victoria, Guildhall, York	The Committee	50*l.*	do
*Police and Fire Brigade Buildings	County Borough of Sunderland	100*l.*, 50*l.*, and 25*l.*	Aug. 30

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Club Buildings, Amble, Northumberland	.....	G. Reavell, Architect, Alnwick	Mar. 25
Carriage Shed, Offices, &c., Irlams	Lancs. & Yorks. Railway Company	R. C. Irwin, Hunt's Bank, Manchester	do.
Additions to School, Keekle	.....	J. S. Moffat, Architect, 53, Church-street, Whitehaven	do.
Church, Victoria-road, Kirkcaldy	.....	W. Dow, Architect, 269, High-street, Kirkcaldy	do.
Groynes	Felixstowe U.D.C.	S. E. Fisher, Surveyor, Town Hall, Felixstowe	do.
Boundary Walls	Rotherham Guardians	H. L. Tacon, Architect, 11, Westgate, Rotherham	do.
Well Sinking, &c., Cliddesden	Basingstoke Town Council	G. Fitton, Town Hall, Basingstoke	do.
Residence, Victoria-road, Elland, Yorks	.....	F. F. Beaumont, Architect, Southgate Chambers, Halifax	Mar. 26
Alterations to Masonic Lodge, Dorchester	.....	J. Feacey, South Walks, Dorchester	do.
Farm Buildings, Livingston, N.B.	.....	Dalgleish & Bell, 1, Rutland-square, Edinburgh	do.
Workmens' Dwellings, Pilley Green, Birdwell, York	.....	G. A. Wilson, Architect, Hartshead Chambers, Sheffield	do.
Church, Builth Wells, Wales	.....	Habershon & Co., Architects, Pearl-street, Cardiff	do.
Additions, &c., to Sanatorium, Bengeworth	Evesham Joint Hospital Board	H. S. Harvey, Bengeworth, Evesham	do.
Chimney Shaft	Maidenhead Town Council	P. Johns, Borough Surveyor, Guildhall, Maidenhead	do.
Manse, Quorn, Leicester	.....	Barrowcliff & Allcock, Architects, Leicester	do.
Additions to Offices, Eastcroft Depot	Nottingham Corporation	A. Brown, Civil Engineer, Guildhall, Nottingham	do.
Cast Iron Fire-escape Stairs	Ormskirk Guardians	Mr. Dod, Architect, 16, Exchange Buildings, Liverpool	do.
Road Works, Shaw-lane	Barnsley Corporation	J. H. Taylor, Civil Engineer, Manor House, Barnsley	do.
Road Works, Fairfax-road, &c.	Birkenhead Corporation	C. Brownridge, Civil Engineer, Town Hall, Birkenhead	do.
*Erecting Electric Generating Station	Maidenhead Town Council	Council Surveyor, Guildhall, Maidenhead	do.
Additions to Hospital	Oughterard Guardians	J. Perry, Architect, Galway	Mar. 27
Concrete Wall, Cleethorpes Park	Cleethorpes U.D.C.	E. Rushton, Civil Engineer, Poplar-road, Cleethorpes	do.
Water Works	Castleford U.D.C.	Richardson & Hartley, Engineers, East Parade Chambers, Leeds	do.
Alterations to Stables, Coach-house, &c.	Twickenham U.D.C.	F. W. Pearce, Surveyor, Town Hall, Twickenham	do.
Pumping Station Works	Ilkeston Water Board	G. & F. W. Hodson, Engineers, Loughborough	do.
Chapel, Cwmdare, Aberdare	.....	Rev. D. Griffiths, 94, Bwlfa-road, Cwmdare	Mar. 28
Residence, Gortin, Co. Tyrone	Mr. T. Jones	J. M. Robinson, Architect, 7, East Wall, Londonderry	do.
Villa, Birwain, Aberdare	Mr. T. Naylor	T. Roderick, Architect, Clifton-street, Aberdare	do.
Five Houses, Francs-street, Parkgate	.....	J. Platts, Architect, High-street, Rotherham	do.
House, Mayfield, near Aberdeen	.....	Jenkins & Marr, Civil Engineers, 26, Bridge-street, Aberdeen	do.
Thirteen Cottages, Garndiffaith, Wales	.....	A. Gay, Prospect Place, Garndiffaith	do.
Alterations to Farm Buildings, Belnaboth	Great Harwood (Lancs) U.D.C.	Jenkins & Marr, Civil Engineers, 16, Bridge-street, Aberdeen	do.
Slaughter Houses	.....	A. H. Dunkin, Surveyor, Town Hall, Great Harwood	Mar. 29
Eight Houses, Mickley Riding	Hospital Committee	Badinoch & Bruce, Architects, 55, Pilgrim-st., Newcastle-on-Tyne	do.
Restoration of Chapel, Trowbridge	.....	W. W. Snailum, Architect, Church-street, Trowbridge	do.
Hospital, Trowbridge	.....	W. J. Mann, Union Offices, Trowbridge	do.
Additions to Schools, Fairmantle-street, Truro	Messrs. J. Benn & Co.	Carder & Carder, Architects, 4, Princes-street, Truro	do.
Hotel, Blaina, Mon.	Glancynon Building Club	T. Roderick, Architect, 50, Glebeland, Merthyr	Mar. 31
Warehouse, Oak Mills, Clayton, Yorks	.....	Milnes & France, Architects, 99, Swan-arcade, Bradford	do
Houses, Abercynon, Wales	Patrington Guardians	T. Davies, Navigation House Hotel, Abercynon	do.
Six Houses, Hengoed, Wales	Cockermouth R.D.C.	P. Vivian Jones, Architect, Hengoed	do.
Infirmary, near Hull	Mr. J. W. Lewis	Runton & Barry, Architects, Savile Chambers, Hull	do.
Cast Iron Water Main, near Keswick	.....	J. B. Wilson, Civil Engineer, Court Buildings, Cockermouth	do.
Villa, Merthyr Tydfil	Barnstaple Gas Company	T. Roderick, Architect, 50, Glebeland, Merthyr	do.
Wesleyan Chapel, Madron, Cornwall	Cockermouth R.D.C.	H. Maddern, Architect, 26, Clarence-street, Penzance	do.
Retorts	.....	F. L. Schofield, 15, Cross-street, Barnstaple	do.
Cast Iron Water Main, Tallantire	Royal Nat. Eisteddfod of Wales	J. B. Wilson, Civil Engineer, Court Buildings, Cockermouth	do.
Grand Stand, &c., Colne, Lancs	.....	R. S. Pilling, Architect, Colne	April 1
Pavilion, Bangor, North Wales	Epsom R.D.C.	F. Bellis, Architect, High-street, Bangor	April 2
Presbyterian Manse, Ashington	West Ham Union	O. Blythe, Architect, Morpeth	do.
Engineer's Cottage at Ewell Sewerage Works	Borough of Hove	H. D. Searles Wood, 157, Wool Exchange, Colman-street, E.C.	do.
*Stoves and Ranges	Ealing Town Council	Clerk's Office, Union Workhouse, Leytonstone, N.E.	do.
*Granite Kerbing, &c., on Hove Sea Wall	Com. of Dartford Wrkg. Men's Clb.	Borough Surveyor, Town Hall, Hove	do.
*Making-up Roads	North Eastern Railway	Borough Engineer, Town Hall, Ealing, W.	April 3
*Concert Hall, &c., at Westgate House	Metropolitan Borough of Fulham	Westgate Club and Institute, Dartford, Kent	April 4
*Excavator, Bricklayer, and Mason's Work at York	The Company	W. Bell, Architect, York	do
*Reconstruction of Combined Drainage	strand Union	Medical Officer of Health, Town Hall, Fulham	April 5
*New Roads, Muswell Hill	Metropolitan Asylums Board	Vigers & Co., 4, Frederick's-place, Old Jewry, E.C.	April 7
*Married Couples' Quarters at Edmonton Workhouse	Metropolitan Asylums Board	A. A. Kokwick, 18, Outer Temple, Strand	April 8
*Gate Porter's Lodge, &c., Northern Fever Hospital	Walthamstow School Board	Office of the Board, Embankment, E.C.	April 10
*Engineer's Cottage, Park Fever Hospl. Hither Green	Ilford School Board	Office of the Board, Embankment, E.C.	do.
*Additions, &c., Higham Hall and Forest-road Schools	Lambeth Guardians	H. Prosser, Architect, School Board Offices, Walthamstow	April 14
*Erection of School, &c., Loxford Park Estate	Admiralty	C. J. Dawson, Architect, 7, Bank-buildings, Ilford, Essex	do.
*New Offices, &c., Brook-street Infirmary	Gloucester School Board	Clerk to the Guardians, Brook-street, Kennington-road, S.E.	April 15
*New Coastguard Buildings, near Falmouth	Sir C. Furness	Director of Works Dept., Admiralty, 21, Northumberland-avenue	to
*Infants' School	.....	H. Medland, Architect, 15, Clarence-street, Gloucester	May 21
Stables, Sheds, &c., Grantley	.....	Bland & Bown, Architects, Harrogate	No date
Theatre, Halifax	Mountain Ash U.D.C.	R. Horsfall & Son, Architects, Halifax	do
Additions to Church Schools, Potter's road		F. Child, Surveyor, 65, Chancery-lane, W.C.	do.
*Iron Buildings for Temporary Offices		The Surveyor, Town Hall, Mountain Ash	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Applications to be in
*Clerk of Works	Borough of Shoreditch	3*l.* 3*s.* per week	Mar. 26
*Drainage Inspector	Metropolitan Borough of Fulham	120*l.*	April 5
*Surveyor's Assistant	Metropolitan Board of Woolwich	130*l.* per annum	April 7
*Assistant Clerk in Works Department	Paddington Borough Council	100*l.*	April 9
*Chief Engineer and Surveyor	County Borough of Northampton	600*l.* per annum	April 16

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, xviii. & xix.

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TENDERS (*continued*)—

ELTHAM.—For the erection of the new depot for the London Parcels Delivery Co., Ltd., High-street, Eltham, Kent. Mr. Henry Poston, architect, 39, Lombard-street, E.C. :—

Wm. Shepherd	£4,450	Blyton & Sons, Kennington*	£3,925
T. Knight	4,319		
Jerrard & Son	3,973		

GRAYS (Essex).—For carrying out alterations and additions to The Elms, Grays, and putting in a system of hot-water heating to the satisfaction of Mr. Christopher M. Shiner, architect, 3, Bond-court, Walbrook, E.C. :—

Wm. Potter	£1,650	J. J. Lawrence	£1,545
Hammond & Son	1,589	J. Brown*	1,470

HARROW.—For additions to Greenhill Laundry. Mr. S. J. Reynolds, consulting engineer. Reigate :—

Chimney and Boiler Seating.

Cross & Co.	£760 0	Poulton & Son*	£710 10

Sorting and Drying Rooms and Boiler House.

Funnell & Co.	£2,796 0 0	Kiddle & Son	£2,309 0 0
Lacy & Eyden	2,539 0 4	Akers & Co.*	2,187 0 0
Drake & Son	2,350 0 0		

HASTINGS.—For the erection of walls, fencing, also for drainage, &c., at the cemetery, for the Corporation. Mr. P. H. Palmer, C.E., Town Hall, Hastings :—

W. Smith, Silver Hill, St. Leonards .. £2,975 19 9

HEREFORD.—For the restoration of St. James's Church. Messrs. Nicholson & Hartree, architects, Hereford :—

H. Smith	£5,707 0 0	Lewis & Co.	£4,985 0 0
King & Son	5,688 0 0	Bowers & Co.	4,830 0 0
Hatch & Sons	5,400 0 0	Beavan & Hodges	4,682 0 0
R. Morgan	5,270 0 0	C. Cooke, Hereford†	4,400 0 0
Broad & Co.	5,207 2 6		

† Revised and accepted.

LEEK (Staffs).—For the erection of a poultry market, for the Urban District Council. Mr. John Myatt, surveyor, Town Hall, Leek :—

T. Grace	£1,124 0	J. Heath	£1,055 15
S. Salt	1,090 0	Heath & Lowe, Leek*	940 0
Embrey & Co.	1,067 17		

LONDON.—For building casual wards, clothes-store, laundry, and other buildings at Gainsborough-road, Hackney Wick, for the Guardians of the Hackney Union. Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C. Quantities by Mr. G. T. G. Wright, 3, Great Winchester-street, E.C. :—

	£		Allowance per yard cube for sand. s. d.
A. Monk	35,000	....	5 0
Todd & Newman	32,946	....	—
Kirk & Randall	31,323	....	3 0
I. Applebys	30,950	....	—
W. H. D. Kelland	30,400	....	4 6
McCormick & Sons	29,876	....	3 6
Coulson & Lofts	29,800	....	—
Thomas & Edge	28,884	....	4 9
Lawrance & Son	28,500	....	—
B. E. Nightingale	28,500	....	5 0
W. J. Clark	28,419	....	3 6
H. Lovatt	28,302	....	3 6
Chessum & Sons	28,009	....	5 0
Wilson Bros. & Lamplough	27,856	....	4 0
Killby & Gayford	27,828	....	3 0
Perry & Co.	27,495	....	4 0
Sowin Bros.	27,243	....	4 6
C. G. Hill	26,985	....	5 0
Shurmur & Sons	26,946	....	5 0
Dearing & Son	24,983	....	3 0
Herbert Bros., Corporation-street, West Ham, E.*	24,100	....	4 0

LONDON.—For building new factory, Beaumont-road, Leyton, for Mr. W. H. Newall. Mr. W. A. Finch, architect, 76, Finsbury-pavement, E.C. :—

T. L. Green	£2,765	Perry Bros.	£2,477
Lawrance & Sons	2,762	C. North	2,455
S. Kind	2,640	Barrett & Power	2,372
Shurmur & Sons	2,493		

LONDON.—For the erection of the Carters' Arms, Beckton-road, Canning Town, for Messrs. Savill Bros., Ltd. Mr. Henry Poston, architect, 39, Lombard-street, E.C. :—

Todd & Newman	£1,659	W. J. Maddison, Canning Town*	£1,435
A. E. Symes	1,587		
Blyton & Sons	1,510		

For three cottages adjoining the above :—

W. J. Maddison £980

LONDON.—For receiving wards, officers' quarters, and waiting hall at Wandsworth Infirmary. Messrs. Mark J. Lansdell and Edmund J. Harrison, architects and surveyors, 65 and 66, Basinghall-street, E.C. :—

			Credit for Old Materials.
R. Neal	£17,442	....	£248
R. A. Jewel	17,327	....	250
Wilson, Bros. & Lamplough	17,184	....	200
Viney & Stone	16,750	....	50
W. Keys	16,684	....	200
Foster Bros.	16,668	....	35
T. G. Sharpington	16,298	....	—
W. Wallis	16,184	....	190
Lorden & Son	15,888	....	111
J. R. Ward	15,547	....	—
Sabey & Son	15,545	....	160
Smith & Son	15,400	....	200
Whitehead & Co.	15,399	....	424
C. G. Hill	15,355	....	165
Turtle & Appleton, Wandsworth*	14,980	....	250
E. Triggs	14,950	....	200
J. Appleby	14,700	....	50
Edwards & Medway	14,690	....	170
E. Chamberlain	14,478	....	35

LONDONDERRY.—For residence at Lawrence-street (Foyle College Grounds), for Mr. W. N. McGuiness. Mr. J. P. McGrath, architect, 28, Carlisle-road, Londonderry :—

Alexander Dunlop, Sackville-street* £580
Amended tender omitting painting and plumbing work.

LONDONDERRY.—Three cottages at Lecky-road for Miss Gallagher. Mr. J. P. McGrath, architect, 28, Carlisle-road, Londonderry :—

Gallagher & Sons, Moville* £375

MAESTEG (Wales).—For the erection of school buildings, Blaenllynir, for the School Board. Messrs E. W. Burnett & Son, architects, Tondu, near Bridgend :—

Isaac Rees	£3,065 10	J. Jenkins, Caeran, Maesteg‡	£2,895 0
Cooksley & Co.	3,040 0		

‡ Accepted subject to approval of Education Department.

Nantyffyllon Schools, Maesteg School Board.

Lewis & Sons	£1,450 0	Henry Evans	£1,295 10
Isaac Rees	1,347 8	Stephen Lewis, Maesteg‡	1,050 0
Cooksley & Co.	1,330 0		

‡ Accepted subject to approval of Education Department.

MANOR PARK (Essex).—For the erection of the new Earl of Essex Hotel, Manor Park, Essex, for Mr. Joseph Hill. Mr. Henry Poston, architect, 39, Lombard-street, E.C. Quantities by Mr. J. Rookwood, 25, Bedford-row, W.C. :—

Contract No. 1.—Foundations and Substructure.

Blyton & Sons	£1,550	Todd & Newman	£1,369
Mowlem & Co.	1,507	W. J. Maddison, Canning Town*	1,285
Hall, Beddall, & Co.	1,462		

Contract No. 2.—Superstructure.

Hall, Beddall, & Co.	£13,800	Blyton & Sons	£13,515
John Mowlem & Co.	13,693	W. J. Maddison, Canning Town*	13,355
Todd & Newman	13,609		

MARYPORT.—For the erection of a cottage hospital. Mr. C. Eaglesfield, architect, Maryport :—

Masonry.—W. Marshall, Maryport*	£568	9	0
Joinery.—J. Kendall, Maryport*	290	0	0
Slating.—M. Clark, Nesberton*	88	0	0
Plastering.—T. Kirk, Nesberton	115	0	0
Plumbing.—W. Thompson, Maryport*	114	11	9
Painting and Glazing.—J. McKay, Maryport*	26	10	9

NEWCASTLE-UNDER-LYME (Staffs).—For the erection of two houses. Mr. Wm. Campbell, architect, 2, Bagnall-street, Hanley :—

S. Heath, Victoria-road, Basford, Stoke-on-Trent* £797

NEWPORT (Mon.).—For the erection of stabling for thirty-four horses, for Messrs. Phillips & Sons. Messrs. Habershon, Fawckner, & Groves, architects, 41, High-street, Newport. Quantities by the architects :—

Jones & Son	£6,187	A. E. Parfitt	£5,662
Lawson & Co.	6,183	Leadbeter Bros.	5,597
J. Linton	5,961	C. H. Reed	5,509
Smith Bros.	5,870	F. W. Powles	5,435
Dyson Parfitt	5,819	D. W. Richards	5,298
E. C. Jordan	5,787	Jessett & Fisher	5,245
C. Locke	5,750	J. Hooper*	5,185
D. J. Davies	5,732	[All of Newport.]	
A. S. Morgan	5,683		

NEWPORT (Mon.).—For additions to the Newport Arcade. Messrs. Habershon, Fawckner, & Groves, architects, High-street, Newport :—

Jessett & Fisher	£399	J. Hooper	£350
W. J. Williams	390	Leadbeter Bros.	327
D. W. Richards, Ltd.	358	E. C. Jordan*	320

[All of Newport.]

SALISBURY.—For building new residence—from Plinth level—at Milford Manor, Salisbury, for Mr. Richard Gerrish. Mr. Fred Bath, architect, Salisbury :—

Guppy & Chant	£12,000	0	0
Holliday & Greenwood, Ltd.	8,557	0	0
J. Downham	8,386	2	7
C. H. Gibson	7,965	0	0
Harris & Son	7,949	0	0
Exors. of the late W. Franklin	7,916	13	0
Merrick & Son	7,908	0	0
C. H. Green	7,900	0	0
H. Cawte	7,834	2	0
B. E. Nightingale	7,800	0	0
Shillitoe & Son	7,800	0	0
Bailey & Marlow	7,765	10	0
Webb & Co.	7,395	0	0
T. Dawkins	7,550	0	0
W. Beazley, Calne, Wilts*	7,489	0	0

* Accepted, subject to deductions amounting to £700

SUDBURY (Harrow).—For alterations and additions to Tyon Villas, Sudbury, Harrow, for Mr. Martin Morris. Messrs. Higgs & Rudkin, architects, 25, John-street, Bedford-row, W.C. :—

John Milroy	£127 15	Parfitt & Co.*	£117 15

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect :—

* *Recommended for acceptance.*

BONNER-STREET SCHOOL (Bethnal Green).—Works to offices, &c. :—

Barrett & Power	£446	Stevens Bros.	£36 8
J. Peattie	425	F. Bull*	321
Marchant & Hirst	395		

CHEQUER-STREET SCHOOL, BUNHILL-ROW, ST. LUKE'S.—Sanitary and drainage works :—

G. Neal	£2,157	Williams & Son	£1,998
The Sanitary Lead Lining and Pipe Bending Co., Ltd.	2,104	J. Peattie	1,966
		Willmott & Sons	1,960
L. H. & R. Roberts	2,068	Stevens Bros.	1,949
Johnson & Co.	2,051	Ashby & Horner	1,943
		F. Bull*	1,889

POCOCK-STREET SCHOOL (Blackfriars).—Drainage and sanitary works :—

J. & M. Patrick	£5,217	J. & C. Bowyer	£2,937
Rice & Son	3,293	Johnson & Co.	2,935
Leney & Son	3,194	Falkner & Sons	2,893
Maxwell Bros., Ltd.	3,176	G. Parker*	2,875
W. Downs	3,090		

"PULTENEY" SCHOOL (Berwick-street, Soho).—For sanitary and drainage works :—

G. Neal	£2,145	J. Peattie	£1,988
Johnson & Co.	2,112	R. P. Beattie*	1,764
L. & R. Roberts	1,994		

REPAIRS ON REVISED SCHEDULE OF PRICES.—For executing repairs to schools and to head offices of the Board on revised schedule of prices :—

Division.	Groups.	—	Percentage to be added on the Schedule for Work comprised in a Repairs. Measured Work.	b Sanitary. Measured Work.	c Daywork.
City	—	H. Line, 81, Peckham Rye S.E.*	7½	10	5
Chelsea	1 and 2	W. R. & A. Hide, 3, Carthew-villas, Hammersmith, W.*	10	10	10
,,	3	E. B. Tucker, 82, Lavender-hill, S.W.*	5	7½	5
,,	4	J. & M. Patrick, Wandsworth, S.W.*	9½	9½	9½
Finsbury	1 and 2	Johnson & Co., 97 and 99, Southwark Bridge-road, S.E.*	10	15	7½
Greenwich	1, 2, 3, and 5	Kirk & Randall, Woolwich, S.E.*	10	15	10
,,	4 and 6	G. Kemp, 43, High-street, Sydenham, S.E.*	10	10	10
East Lambeth	1 and 2	H. Line, 81, Peckham Rye, S.E.*	5	9	S
,,	3 and 4	Maxwell Bros., Ltd., 310, Brixton-road, S.W.*	7	15	7
,,	5	Maxwell Bros., Ltd., 310, Brixton-road, S.W.*	7	15	5
West Lambeth	1	Rice & Son, 15, Stockwell-road, S.W.*	8	15	5
,,	2	Maxwell Bros., Ltd., 310, Brixton-road, S.W.*	2½	5	2½
,,	3	E. B. Tucker, 82, Lavender-hill, S.W.*	S	S	S
,,	4	E. Triggs, 92, The Chase, Clapham, S.W.*	7½	10	15
,,	5	Garrett & Son, 17, Balham-hill, S.W.*	10	10	10
,,	6	G. Kemp, 43, High-street, Sydenham, S.E.*	10	10	10
Southwark	1 and 2	H. Line, 81, Peckham, Rye, S.E.*	5	9	S
,,	3	Marsland & Sons, 1, York-street, Walworth, S.E.*	12½	25	12½
,,	4	Marsland & Sons, 1, York-street, Walworth, S.E.*	12	25	10
Westminster	—	Lathey Bros., St. George's Works, New-road, Battersea Park, S.W.*	12½	17½	10
Board Offices	—	T. L. Green, 65 and 66, Eagle-street, Holborn, W.C.*	15	15	15

"S" means at the Schedule of Prices.

[*See also next page.*

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TOWNMEAD-ROAD SITE (Fulham).—New school in accordance with revised plans. The Board of Education have santioned the erection of a school on the site in Townmead-road, Fulham (Sub-Division Q[1] of Chelsea), to provide accommodation for 1,080 children. Upon this site three temporary iron buildings have been provided and are now in use. The school, which is a three-story building, contains the following accommodation: boys, 320; girls, 320; infants, 322; total, 962. Graded school on three stories. Halls: boys, girls', and infants', 30 ft. by 58 ft. each. Classrooms: boys' and girls' each, 48, 48, 48, 48, 48, 40, 40; infants', 48, 48, 48, 48, 50, 40, 40. Drawing classroom, 1,247 ft. area; manual centre for 20. Heating by open fires and stoves. Area of site, 71,050 sq. ft. Playgrounds, area per child: boys', about 76 ft.; girls' and infants', about 48 ft. A schoolkeeper's house is also included in the plans:—

Miskin & Sons	£28,187	C. Cox	£25,210
Lathey Bros.	26,547	Kirk & Randall	25,210
Simpson & Son	26,222	McCormick & Sons	24,643
Leslie & Co., Ltd.	26,161	Stimpson & Co.	24,600
Gough & Co.	26,111	Smith & Sons, Ltd.	24,560
Wallis & Sons	25,548	Spencer, Santo, & Co., Ltd.	24,554
Lawrance & Sons	25,519	Lorden & Son	24,444
J. & M. Patrick	25,390	Holloway Bros.	24,406
King & Son	25,240	Johnson & Co., Ltd.*	23,950
Treasure & Son	25,218		

WOOD'S-ROAD SCHOOL (Peckham).—For heating works:—

Cannon & Sons	£849 0	Duffield & Sons	£635 0
Stevens & Sons	845 0	J. C. Christie	625 0
J. & F. May	820 0	The Paragon Heating Co*	518 0
J. Esson	705 14		
J. Grundy	675 0		

BRUSHES.—Running contract for the supply of flue brushes, &c.:—

		Mechanical Appliance Co.* £ s. d.
Flue brushes, No. 1	per dozen	0 10 6
,, No. 2	,,	0 9 6
,, No. 3 with two rods complete	,,	4 16 0
,, No. 4	,,	1 0 0
,, No. 5	,,	0 18 0
Bamboo rods for brushes, No. 3	,,	2 2 0

HEATING APPARATUS—on revised schedule of prices.—For repairs to heating apparatus in schools:—

Groups.		Percentage to be added to or deducted from schedule prices.
1	J. Esson, 102-7, Fetter-lane, E.C.*	At schedule prices.
2	Palowkar & Sons, 90 and 91, Queen-street, E.C.*	,,
3	J. C. Christie, 3 and 5, Mansell-street, Aldgate, E.*	2½
4	Knight & Sons, 222, Great Portland-street, W.*	—5
5	J. Esson, 102-7, Fetter-lane, E.C.*	At schedule prices.
6	G. Davis, 28, Silver-st., Kensington, W.*	,,
7	Wenham & Waters, Ltd., Croydon*	5
8, 9, and 10	Cannon & Sons, 107, London-road, Southwark, S.E.*	At schedule prices.
11	J. Esson, 102-7, Fetter-lane, E.C.*	,,
12	Wenham & Waters, Ltd., Croydon*	5

HEAD OFFICES OF THE BOARD.—For periodical inspection of lifts:—

	Per annum.		Per annum.
R. Middleton	£60 0	Easton & Co., Ltd.	£25 0
Moffatt & Eastmead, Ltd.	50 0	Clements, Jeakes & Co.*	24 0
W. T. Rounsivell	33 0	C. & A. Musker, Ltd.	20 0
Waygood & Co., Ltd.	29 10		

LOCKS, &c.—For locks and ironmongery for new schools, enlargements, &c.

(*a*) Parkes & Co., New-road, Willenhall.
(*b*) Rowland Hodges, Queen Victoria-street, E.C.
(*c*) Pryke & Palmer, Upper Thames-street, E.C.
(*d*) Nettlefo'd & Sons, High Holborn, W.C.

MAP AND DIAGRAM TABLES.—Supply of map and diagram tables:—

	Each.		Each.
Spencer & Co.	£10 12 6	North of England School Furnishing Co.	£6 10 0
Educational Supply Association, Ltd.	8 19 0	London School Furniture Co.	6 8 0
Marchant & Hirst	7 15 0	T. Cruwys	6 5 0
Lascelles & Co.	7 3 0	Pearson & Brown	5 10 0
H. Bouneau	6 10 0	Waring & Sons, Ltd.*	5 7 6

OIL AND SUNDRIES.—Running contract for supply of oil and sundries for outdoor staff of Warming Engineer's sub-department:—

* Messrs. W. H. Willcox & Co., of Nos. 34 and 36, Southwark-street, S.E., for the supply of oil and other sundries, with the exception of belt syrup.

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Sketch of Staircase in Old Palace, Genoa ..... Drawn by Mr. H. Raine.
St. Peter's Church, Cricklewood ..... Mr. T. H. Watson, F.R.I.B.A., architect.
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St. Mark's and St. Antonio's.

TWENTY years ago the greatest art critic of the nineteenth century was waging an apparently unsuccessful war with the tasteless officialdom of Young Italy, which in those days was perpetrating the greatest atrocities against the historic monuments of the Land of Art. Ruskin, G. E. Street, and others were to some extent successful at the time, and now those who have entered into their labours may, perhaps, enjoy a particular pleasure in seeing how changed are the times. Public opinion has completely gone over to the conservative side of the question; the "Restorers" are nowhere. This remarkable change can be studied especially well in St. Mark's. The atrocious "restorations" of thirty to twenty years ago are with us to-day, and the machine-made "Gothic art" of the period, with its crude colouring and lifeless drawing, covers scores of square metres of the wall space once occupied by ancient mosaics. Almost the whole of the mosaics of the narthex were "restored" at that time, and deplorable, indeed, are the results. Even the lapse of a quarter of a century has had no appreciable softening effect to change their hard-lined, misunderstood imitation of what may originally have existed in their places. They must go down, alas! to posterity as samples of the utter want of feeling for decorative art evinced by Italians in the latter half of the nineteenth century.

At the present time several works of reparation are going on in St. Mark's. The most important is the complete reinstatement of the mosaic, and the dome to which it is attached, which forms the covering to the south transept. This is being carried out with all the thoroughness so characteristic of Italians in works of the kind—and, indeed, in all building operations.* Other minor repairs to the mosaic are taking place in various parts of the church, and the same elaborate care is being manifested in every case. But how changed are the conditions under which this modern work is being executed from those in the days of Ruskin and Street! *Now* the object in view is to produce an *untouched appearance*.

The famous wavy floor of mosaic (its waviness thought by the credulous in such matters to have been intentionally designed to represent a "sea of life," but which in reality is due to bad foundations) is being patched here and there—but in a very different manner from the portion in the north-west aisle, restored in the taste of the period some twenty-five years ago. The present restorations are actually being made without levelling the pavement! Could anything more distinctly demonstrate the almost excessive conservatism which is now passing over the land. The Italians are, indeed, proving themselves masters in the craft of preserving ancient monuments, and although the conservation of the uneven levels in St. Mark's floor seems carrying the modern principles of reparation to an extreme, still the careful reproduction of the original with all its characteristic griminess is distinctly satisfactory, and an altogether more agreeable result than anything of the kind attempted in the old days.

* And in nothing is this thoroughness so conspicuous as in the almost monumental scaffoldings which are made use of on such occasions as the present. In more northern countries a comparatively rough arrangement of poles and boarding tied up with ropes, and with a patchwork screen to preclude inquisitive investigation by the public, would be considered sufficient. Here in Venice, as at the still more imposing work going on in the Baptistry of Florence (which has already been several years in progress), the scaffolding has been elaborately constructed of carefully-fitting timbers, with a neat ceiling of boards dividing off the whole space occupied for the "restoration" from the church below, so that many visitors to the church may be quite unaware of so important a work being in progress, so neatly is the whole operation carried on without affecting the floor-space below. This self-supporting scaffold rests entirely on the great main cornice at the base of the dome; the space screened off within is lighted by the little windows which form a peculiar feature of Byzantine domical architecture, and in this case are within the curve of the dome

St. Mark's has an unique history. At one time it was the centre monument of a mighty Republic, the chief temple of a nation much in the sense, perhaps, of what the Parthenon represented to the Greeks. And as such the peculiar Byzantine style of the building seems to have been most religiously preserved throughout the ages in a way which was almost unnatural. For we must remember that in the days when the Serene Republic was at the zenith of its wealth and splendour, the new principles of art of at least the Renaissance, if not the pseudo-Classic schools, were generally accepted, and to men imbued with such ideas the mosaic interior of St. Mark's must have appeared but a "goffa" (to use Vasari's word) monument of their rude and barbarous forefathers. It is, indeed, surprising that St. Mark's did not share the fate of old St. Peter's or the other basilicas of Rome, for Venice was not a deserted capital like Ravenna, but a centre of the revival of the new studies in art and literature. How often Palladio, or Scamozzi, or their fellow workers in the great change of taste in the sixteenth century, must have contemplated with pleasurable anticipation the remodelling of the old building! As we know from their writings, they could but have looked upon such a building as quite beneath criticism from their standpoint of exclusive admiration for the Classic style. And certainly the Neo-Classicists may be allowed to have had some reason on their side. St. Mark's is not an example of architecture in the organic or true sense, any more than certain other great churches of Italy which are in what the Italians call the "fragmentary" style, such as Pisa, or Siena, built up of second-hand materials in a way which may be highly decorative and artistic, but scarcely to be deemed the highest type of architecture. Critically examined, St. Mark's consists of little more than a huge vaulted shell of brickwork, lined and decorated with precious marbles and mosaics; but not one of its innumerable marble columns was ordered at any quarry for the

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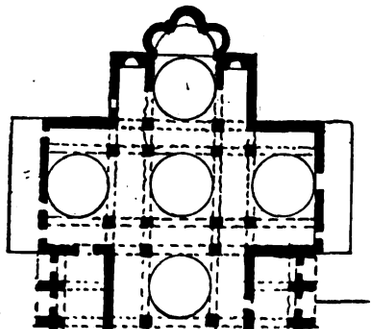
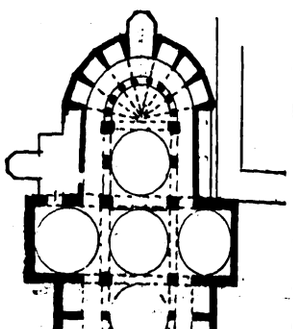


Sketch Plan of St. Mark's, Venice.

St. Antonio, Padua. Sketch of Interior, looking East.



Sketch Plan of St. Antonio, Padua.

purpose; all were stolen from Levantine buildings and sent home as ballast in returning empty galleys of the period. Its glass mosaic decorations are partly remarkable on account of their being used nowhere else in Venice. Within the region of the lagunes there is nothing exactly resembling St. Mark's either in construction, scale, or mode of decoration, except St. Antonio at Padua, which seems a more perfected example of the same system of building. The more ancient Duomo of Torcello has little in common with it beyond the mere circumstance of a similar decoration in mosaic; in other respects this venerable church belongs to the series of Basilicas of Ravenna.

Probably the chief reason for the escape of St. Mark's from the vandalism of the pseudo-classic age, in addition to its evident incompatibility of plan and construction with the models of the later taste, was the completeness of its mosaic decorations. Few, if any, buildings of the size were so complete in a mediæval style when the great change of the fifteenth century took place. The mosaic pictures which were added by certain celebrated artists at that period were probably in the form of restorations or, rather, substitutions; such, for instance, as the figure of St. Mark—attributed to Titian—over the central west door, which was clearly a mere replacement of the much older mosaic of a totally different style. To alter the basilica at all would have involved the complete sweeping away of its chief and characteristic feature, the mosaic work and marble sheeting which covers every square foot of its brick walls. St. Mark's was thus one of the few mediæval buildings which benefited by a completeness, which, although preventing that picturesqueness associated with a mingling of styles, at the same time preserved it as a curiosity on account of its unique character. All through the later centuries the golden, glittering splendours of the mosaic doubtless excited the admiration of the Venetian populace, and the fact that great artists like Titian associated their names with such a style of art would also naturally tend to check any suggestions which the architects of the period would make for converting the basilica into one of the coldly correct classical reproductions so often attempted in those days. But notwithstanding the influences surrounding and threatening its very existence, St. Mark's escaped and survived to our modern days for the admiration of a generation more eclectic in taste.

As has been remarked, almost the only building which at all resembles St. Mark's is the neighbouring church of St. Antonio in Padua. In this latter the same massive piers support the same kind of domes, and the general appearance of the building suggests that a similar use of mosaic was originally intended, although not an inch of such a decoration was ever executed. St. Antonio was evidently built, or at least finished, long after the change of taste took place; when mosaic was no longer the medium of an artistic expression to which the usual developments of an architectural style such as the Byzantine seem rather sacrificed. Both St. Mark's and St. Antonio's belong to a period of transition from the ancient basilica of the Ravenna type to the church of the short-lived "Gothic" style of Italy. In St. Antonio the beginning of the pointed arch mode of construction, the striving for lofty proportions, and, above all, the introduction of the central European type of east end, with its ambulatory and chevet of encircling chapels, all belong to the later style; whilst at the same time a very strong resemblance (especially in plan) to the basilica of Venice suggests the possibilities of a still finer example, as originally designed, of a mosaic-lined interior of grand proportions which was never carried into effect. In St. Antonio the traditional colonnades of the ancient basilica, which survive to some extent in St. Mark's, are eliminated; the vaulted, domical interior takes the place of the older long-drawn aisles with lean-to roofs. But unfortunately by the time this grand building was completed the mosaic art had been practically abandoned for the more exact fresco painting, with all its astonishing adaptability to decorative work. The huge brick shell, instead of being covered internally with glass mosaic, as was probably, if not certainly, the intention of its original designer, was treated in the style of a later period and presented a sufficiently splendid effect until its frescoes were covered up with the whitewash of the sixteenth century.

At the end of the eleventh century St. Mark's seems to have been remodelled as we see it at the present day. St. Antonio was commenced—that is to say, designed—almost immediately after the death of its tutelary patron in 1231, but according to some accounts it was not finished for decoration until the middle of the fifteenth century. Roughly speaking, rather more than a century intervened between the dates of the two greatest monuments of Venetian architecture, and it is curious to notice what an advance in methods of construction and in general design had taken place in the interval. The church of Padua is a magnificent conception from every point of view, whilst on the other hand the heavy proportions and want of a distinctly architectural character and style in St. Mark's is scarcely redeemed by the richness of its mosaic. The plan of St. Antonio is clearly a lineal descendant from that of St. Mark's, but the suppression of the Byzantine narthex enclosing the west end, and the introduction of the pointed arch as a dominating feature in place of the older style of construction, create an altogether different effect. Indeed, to the ordinary beholder there is not very much resemblance between the two churches at first sight, but, perhaps, if we allow ourselves to imagine the interior of St. Antonio a blaze of mosaic colour and gilding, as it was doubtless intended to be by its original designer, the resemblance between the two becomes clearer, and the imposing character of such a style of architecture and decoration is sufficiently evident. It is to be regretted St. Antonio was never completed as a consummation of the Italo-Byzantine style—a style of particular originality and magnificence.

As has been said, the interior of St. Mark's, owing to its completeness at an early date, escaped to a great extent the alterations which were customary in churches during later ages. But St. Antonio, on the contrary, has been one of those unfortunate buildings fated to perpetual remodelling and transformation. The magnificent works of art with which it is crowded are in themselves perfect, but they were designed by men who could ruthlessly whitewash the frescoes of the Middle Ages. The interior appears to have been entirely painted—the domes, vaultings, walls, pilasters—during

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the fourteenth or fifteenth centuries. These paintings were whitewashed, probably in the sixteenth century, when the numerous additions of that period were made to the interior. At a still later date the basilica suffered from a fire which would necessitate an additional coat or two. Not only the mural decorations of the main body of the church, with its domes, &c., were covered up, but the side chapels of individual character, which always give to an Italian church such additional interest, were reduced to the same white uniformity.

At the present day a scheme is on foot to restore the interior to its pristine splendour; but not, of course, with the idea of introducing the mosaic style which the building was so evidently designed for. The frescoes of the westernmost dome have been laid bare from the whitewash in a somewhat deplorable condition, but they are sufficiently preserved to allow of a perfect reproduction of the original painting. Large designs have been prepared for the purpose by a firm of decorative artists, and these are exhibited in the church with a view of attracting funds for the work. To criticise these productions is a little difficult, because even the large-scale drawings of so vast a building (about 100 ft. in height to the centres of the domes) are necessarily inadequate to give a true impression of what is intended. It is to be hoped that these designs merely represent an approximation to the eventual carrying out of the work, and that the frescoes will be repainted on the original lines as far as may be. These drawings have the unfortunate character of most modern decorative work, they are too evidently the result of study and copyism, made in an office or studio by a designer whose only occupation is that of making such small drawings of work to be carried out in execution by another hand. One of the eastern chapels is being at present decorated on a separate scheme as the national offering of a Polish committee.

Whatever the present scheme for restoring the ancient frescoed interior of St. Antonio may be, there is no doubt the newly-instituted government department for the preservation of the antiquities of Italy will not permit anything but a most accurate copy of the remains still in existence beneath the whitewash.

NOTES.

What is a New Street?

AT a time when so much is being done in the metropolis in the way of altering its streets and thoroughfares, the case of "The Property Exchange, No. 1, Ltd., *v.* Mayor, &c., of Wandsworth" will be read with interest. The question there raised was whether where an existing street is widened all or only some of the owners of property fronting on the street can be made liable to contribute to the expenses of paving the portion added, or whether it forms part of the old street. The street in question was situated at Tooting, and since 1855 had been a thoroughfare repaired by the Wandsworth Board of Works, 16 ft. wide, and with a row of houses on the south side which had been erected some seventy-five years ago. In 1898 the roadway was widened to 40 ft., and certain buildings were erected on the north side; and in 1899 the Wandsworth Board of Works paved the street and endeavoured to charge the expenses on the owners of property abutting thereon. The owner of the houses on the south side resisted this on the ground that the street was an old street, and a summons against him was dismissed by the magistrates. This exact point was decided in the case of White *v.* Fulham Vestry, so their decision was unquestionably right. The Local Authority then apportioned the expenses of paving the added portion of the street on the property to the north of it, and the Court of Appeal affirming, the Divisional Court have held this portion to be a new street within the meaning of Section 105 of the Metropolitan Management Act, 1855, chargable on the owners of property fronting thereon. The decision is not free from difficulty owing to the wording of the section, which makes the "owners of the houses forming such street" liable to pay these expenses, on which it was contended all the owners must be charged. The *ratio decidendi* is, however, as follows:—Section 77 of the Metropolis Management Amendment Act, 1862, which made the owners of land not built upon also liable to contribute, uses the words "the owners of land bounding or abutting on such street," and "street" in the principal Act (Section 250) is made to include any "highway, road, lane, and a part of any such highway, &c.," and the Court held the combined effect of those sections to be the same as Section 150 of the Public Health Act, 1875, under which section on similar facts it has been held (in "Richards *v.* Kessick") that the added strip formed a "new street" for the expenses of paving which the frontagers on such strip were liable.

Urban District Authorities.

THE powers of Urban District Authorities under Section 25 of the Public Health Act, 1875, received consideration in the recent case of Woodford Urban District Council *v.* Stark. The respondent being about to erect two houses gave the District Council due notice, and submitted plans. The District Council, on the report of their surveyor, disapproved the plans on the ground that a combined drain was shown for the two houses, and laid two informations against the respondent under Section 25 of the Public Health Act, 1875. The justices dismissed those informations on the ground that they had no jurisdiction, because under this section, the surveyor had only power to consider the size, materials, level, and fall of such a drain. The Divisional Court remitted the case to the justices, intimating the section gave power to order a separate drain for each house. Before the Divisional Court the argument seems to have been used that the two houses were one building, and consequently one drain only was necessary. This argument is based on the definition of drain contained in Section 4 of the Act which defines it as any "drain of and used for the drainage of one building or only premises within the same curtilage," and on certain cases which have turned on the question whether the system of drainage was a "drain" or a "sewer," with a view to determining whether the private individual or the Local Authority was responsible for its repair, and in this connexion semi-detached houses were held one building, "Hadley *v.* Webb," (1901, 2 ch., 126). Under Section 25 the word "house" is used, and what the Urban Authority has to consider is the "effectual drainage of such house"; and in the case under consideration the Court intimated that the section contemplated at least one drain for each house. It must be borne in mind the Urban Authority, however, can only regard the effectual drainage of that particular house, not its effectual drainage in connexion with any particular system of drainage in use in the district, "Matthews *v.* Strachan" (1901, 2 K.B., 547).

Old Age Pensions.

THE debate last week in the House of Commons, which resulted in the second reading of Mr. Raymond Greene's Bill to enable Local Authorities to grant old age pensions to deserving paupers, was little better than a waste of legislative time. The Secretary of the Local Government Board, of course, said that the Treasury could not possibly find the necessary millions which this Bill would require if it became law. The House, nevertheless, voted for the second reading. Members will thus be able to say to their constituents that they have done their best to obtain old age pensions for deserving poor, though all those who passed through the division lobbies knew perfectly well that this measure was not in the least likely to become law. That Local Authorities in rural districts might do something to re-establish village almshouses for aged persons of good character is undoubted; but this they have now the power to do. Architecturally, there are no more interesting features in the country districts than the old almshouses—such, for example, as those at Abingdon. No doubt the system requires very careful watching, but that it may be used in the future beneficially in many cases there can be no doubt.

Two London Gas Bills.

THE Bills promoted by the Commercial and the South Metropolitan Gas Companies respectively have both been shorn of important clauses by the Select Committee appointed to consider them, but the proposal that the standard illuminating power of the gas supplied by the Commercial Co. shall be reduced from sixteen to fifteen candles, and eventually to fourteen candles, with a compensating reduction in the standard price, was not opposed. We hope to see the standard price of the gas supplied by the Gaslight and Coke Co. reduced next year on similar terms. In view of the fact that gas is now mainly used, not for producing luminous flames, but for heating purposes and for incandescent lighting, it is not surprising that the reduction in the illuminating power was not opposed, but it is somewhat remarkable that no effort has been made by the representatives of the consumers to introduce a heating power standard. The heating value of gas can be determined readily and accurately, and with the reduction in illuminating power there is great danger of a reduction in the calorific value of the gas, and a consequent decrease in its value for heating, cooking, and power purposes. The principal portion of the South Metropolitan Bill was that proposing the abolition of the office of the Gas Referees, three eminent scientists appointed by the Board of Trade to prescribe the methods to be used for testing the metropolitan gas supply. It was also

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sought by this Bill to revert to the primitive testing methods set forth in the Gas Works Clauses Act, 1871. It is gratifying to be able to record that the Select Committee struck out this portion of the Bill without hesitation. To permit less efficiently purified gas to be supplied would be a retrograde step, for purification is not unduly costly; and although great stress was laid by the promoters of the Bill upon the worry and premature senility caused by the stringency of the tests, we do not doubt that the supply of competent gas engineers will suffice to meet the demand.

L.C.C. Subways.

THE by-laws concerning the use of their subways which were approved at the recent meeting of the London County Council will be of interest to many of our readers. We note that the electric light companies are required to give full particulars of the insulation of their cables and the highest electro-motive force for which they are to be used. Full powers for entering the subways in cases of emergency are given, and the keys of the subway entrances will be kept at specified places. The County Council very properly make a rule that no person shall take into a subway any "candle, lamp, or light" other than a safety lamp of approved pattern. They also strictly forbid smoking or even taking a match down the subway except with the consent of the inspecting officer. Not only has the danger from leakage from the gas mains to be guarded against now-a-days, but also the danger from explosive gases distilled from the bitumen which is so largely used for insulating electric mains. The annual charges for the use of the various subways seem to us to be scarcely equitable. A gas or water main above 36 in. in diameter can be laid along the whole length of the Victoria-embankment subway for an annual charge of 50*l.*, whilst for an electric light main contained in a pipe only one-third of the diameter of the gas-pipe, the charge is 84*l.* Again, why should the charge for a cable 18 in. in diameter be only three times as great as for a cable 3 in. in diameter, although it is thirty-six times as heavy and takes up thirty-six times as much room?

Masonry *v.* Steel.

YOUNG people generally think themselves wiser than their elders. Sometimes they are right, more generally wrong. Young nations are very much like other children, and are equally ready to offer advice in quarters where it is not required. As the necessities of young people are not entirely those of older people, so the necessities of young nations are not those of older nations. This view of life has been imperfectly realised in the United States, but it is gradually becoming recognised. One indication of this change is afforded by the growing popularity of masonry bridges among American railroad engineers. In our own country, where things in general are of thoroughly settled character, the inclination of the engineer is towards solid and lasting work. Consequently, masonry bridges have never gone entirely out of fashion, and metal structures of the same class have always been noted for massiveness and stability, so that the railway viaducts of a past generation are still quite suitable for the greatly increased moving loads of the present day. On the other hand, American practice has always had a tendency towards the lightest possible construction consistent with safety, based upon the requirements of the moment. It is now being discovered across the Atlantic that closely-designed metal structures suffer considerably from the great weight and speed of modern traffic, and that if bridges of the present are to be the bridges of the future, the margin of strength must provide for future development as well as for present safety. The masonry arch can be economically built of such proportions as to comply with these essentials, and there are already several examples demonstrating appreciation of the fact in America. One of these is the Rockville bridge, recently completed by the Pennsylvania Railway Co., about 4,000 ft. in length, and consisting of forty-eight masonry arches of 70 ft. span. A steel bridge on the same system is shortly to be replaced by a masonry viaduct of twenty-one arches varying from 51 ft. to 72 ft. span; and a new masonry bridge of eighteen 60-ft. spans is to be built by the company across the Delaware River at Trenton. It is certainly unwise to overlook the possibilities of steel construction, but the other extreme is equally inadvisable.

Building Tests in Paris.

SOME interesting data have been furnished during the demolition of the temporary buildings erected for the Paris Exhibition. The tests applied to the San Marino Pavilion appear to have been of a particularly stringent character, including the agency of fire, and afterwards of physical force. The structure consisted largely of armoured concrete, of which details have appeared in our columns at various times. With the object of subjecting the whole of the pavilion to the influence of the ordeal by fire, a portion of the concrete flooring between the ground and first floors was removed, and large bonfires of woodwork from other demolished buildings were then lighted on the ground floor, so that every part of the structure should be exposed to the action of the flames. That the test was of severe character is proved by the fact that glass in the centre lantern was melted, and that Portland cement on the treads of the staircase had the appearance of being partially fused. However, no serious injury was caused to the essential parts of the structure, for, although plastering suffered, the concrete construction remained intact. Attacks were next made with a battering-ram against one of the turrets, after the supports had been partly removed. The weapon employed weighed about two-thirds of a ton, and, being suspended freely by ropes, it was operated by eight men. After much of the pavilion had been knockod away, the corbel formed by half the building, overhanging some 23 ft., and weighing about 50 tons, was still in position with no visible support beyond a slender column of cored brickwork. These tests seem to justify the confidence in armoured concrete construction entertained by Continental architects and engineers.

Lord Rayleigh's Lectures.

LORD RAYLEIGH concluded his course of lectures on "Some Electrical Developments" last Saturday. He began by showing the effect of bringing an electrified point near a jet of escaping steam, the colour of the jet becoming darker and reminding one of a thunder cloud. The electrification of the jet causes the minute globules of water to coalesce into larger drops, in the same way that atmospheric electricity causes the heavy rain during a thunderstorm. The explanation of the phenomenon was by no means as simple as it was generally supposed to be. The lecturer showed that the same effect could be produced by a current of air that had passed over sulphuric acid, or by merely bringing a flame near the jet. He also showed that a jet of water which contains a trace of milk breaks up into drops exactly in the same way as an electrified jet of pure water. By means of a Braun vacuum tube it was shown how a beam of Kathode rays could be deflected by an ordinary maguet, and by placing this beam in the centre of a rotating magnetic field, it was seen that it traced out a circle of light on a fluorescent screen. Lord Rayleigh stated that good work in studying magnetic fields by this method had been done in Germany. A beam of Kathode rays, unlike a galvanometer needle, had no inertia, and hence no complicated corrections for this effect had to be introduced into the measurements. The question of what Röntgen rays are is still unsolved. Unlike light cr Hertzian waves, they cannot be refracted or polarised; it is even doubtful whether they can be reflected. We would expect that they could be diffracted, but careful experiments by Dutch physicists had proved that no trace of this effect was visible, and hence, if the Kathode rays be caused by an undulatory motion of the ether the wave length must be a hundred times shorter than the wave length of violet light. The old controversy which raged in Newton's time as to whether the corpuscular theory or the undulatory theory of light were true has been revived concerning these rays. It has been suggested that the Kathode rays and the Becquerel rays are simply streams of corpuscles. Lord Rayleigh would point out, however, that there were several effects common to both Röntgen rays and ultra violet light namely, that they both discharged bodies, electrified negatively and affected photographic plates and fluorescent screens. Lord Rayleigh concluded by showing a striking experiment which illustrated how rapidly ozone destroyed indiarubber. It seems to us that this experiment would explain the rapid deterioration of the rubber which sometimes takes place in high tension electric cables, and has generally been attributed to defects in the rubber itself.

Electric Railways.

THE paper on "Electric Railways" by Messrs. Swinburne and Cooper read to the Institution of Electrical Engineers last week is a timely and valuable one. They state the problems that have to be solved very clearly, and give approximate solutions, which, whether right or wrong, are at least perfectly definite, and their assumptions are all stated. Instead of attacking the problems by giving a *résumé* of recent engineering practice, and trying to sift out those solutions which have proved unsatisfactory, they boldly offer original solutions arrived at on scientific principles. They divide the problems of electric railways into three classes, namely, "tubes," suburban railways, and main

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lines. As tube railways, as at present designed, are not meant to be linked on to other lines, they offer a very special problem, in which the main difficulty is to get the train to start sufficiently rapidly. On the Central London Railway, although the trains stop only fifteen seconds at each station, yet this amounts to 10 per cent. of the total time. The authors state that if the cars were arranged as on the Metropolitan of Paris, so that a door at one end is used for entering the car and one at the other end for leaving, then ten seconds would be long enough. In urban lines rapid acceleration and powerful braking are of paramount importance. The authors consider that the main line problem is not yet ready for serious treatment, but they point out many of the advantages that would accrue from electrical working. In this case the power can be cut off without communicating with the driver, and so he will have no need of signals. In some of the systems sketched by the authors it would be easy to signal the exact position of the train to the station. "Models will then move along plans of the railway, so that the trains are controlled entirely from on shore, so to speak." The responsibility of the driver will be reduced to a minimum; all that he has to do being to keep a look out for anything on the line and to start and stop at stations. It will be as easy to run in fogs as in the dark, and they will no longer dislocate the traffic as at present. In the subsequent discussion, Mr. Dow, a well-known American electrician, criticised the constant current system the authors proposed. He said that you could not foretell the behaviour of large series motors merely by knowing how small ones worked, and that he had found by practical experience that series motors on constant current circuits "bucked" severely, with the result that all the passengers got collected at one end of the car. He also gave a humorous description of the "hustling" tactics adopted by the American conductor in order to accelerate the service.

Village Industries. INVITATIONS have been issued for a conference to be held at Warwick Castle at the beginning of May on the subject of Village Industries. Although these may be regarded as largely agricultural, it is obvious that there are a number which are of a purely mechanical nature, and which deserve just as much consideration as those connected with farming or gardening. Among the various means by which the depopulation of the rural districts might be a little stayed is the improvement of the position of various industries connected with woodwork sanitation and leather work. If a dweller in a country district can get as good work at his own door as from a distant town, he will certainly do so, and the well-to-do artisan in an English village is, in many respects, in a better position than his brother in a town. The chief means to produce this result is an efficient system of technical education prolonged and systematic, with some connexion between education and practice, such as the giving advantages, educationally, to apprentices in the various trades and the employment by Local Authorities, County and District Councils of those who have been trained in the Local Educational Training Schools.

Changes in Hanover-square. DURING the past few years Hanover-square, first built nearly two hundred years ago, has suffered considerable alteration, involving the loss of much of its distinctive and uncommon architectural character. The houses, beautifully built of red brick, closely jointed, in the south-west corner, and having elevations with high narrow windows (like that of a house in Henrietta-street, Cavendish-square) after a very infrequent design, formed a highly-pleasing feature of the prospect as one looked towards the widened opening of George-street. But at that spot is now being erected a block of flats and chambers, designed by Messrs. C. Bell, Withers, & Meredith, which quite mar the old-world dignity and repose of that quarter. On the east side of the square, at the corner of Hanover-street, the old concert and ball rooms built for Sir John Gallini have been replaced with a large block of buildings from plans and designs by Mr. J. Sawyer. The "Rooms," latterly occupied by the St. George's Club, had been erected on the site (purchased for 5,000*l.*) of Lord Dillon's town house for Sir John Gallini, and were opened in 1775 by Bach and Abel for concerts, routs, and masquerades. It is said that Salaman there directed the former six of the symphonies which Haydn composed in London, 1791-2, with the remaining six, in the following year, for Salaman's concerts. Shortly afterwards the "Concerts of Ancient Music" were removed from the King's Theatre, Haymarket, to the Hanover-square rooms, which were subsequently used during a long period for the annual performances of the "Messiah" on behalf of the Royal Society of Musicians. The Philharmonic concerts were transferred thither, after the destruction by fire, in 1830, of the old Argyll Rooms in Regent-street, built by Nash for Joseph Welch, and there was held the first series of concerts given by the Henry Leslie Choir. The ceiling of the great room, 90 ft. by 35 ft., was painted by Cipriani. Since the Arts Club quitted their old premises for Dover-street, the front of their former home in the square has been altered; and close by, on the north side, is a new block of flats and shops, with a return-frontage in Harewood-place, designed by Mr. P. Hoffmann, which ill accords with the two adjacent fronts of Harewood House with pilasters and a rounded bay coated with Liardet cement, as added by Robert and James Adam.

Tower Crecy, Campden-hill. THIS house, situated in Aubrey-road, and an adjoining residence in Campden Hill-square, will shortly be offered for sale at the Mart. The property, covering, with the garden ground, nearly 15,000 ft. superficial, occupies a lofty position upon the summit of the hill, and the turret of Tower Crecy forms a conspicuous feature of the landscape as it rises above the trees around. It was built for his own occupation by Thomas Page, the civil engineer, who died in 1877; he adopted a quasi-Gothic style in honour, it is said, of the Black Prince, and as leaseholder was required to hoist a flag upon each anniversary of the battle of Crecy.

The Church of St. Just, Roseland. THERE is no more picturesque Cornish Church than that of St. Just, in Roseland, on the edge of one of the wooded creeks which break into the land of Falmouth Harbour. The overhanging banks of the old graveyard, now bright with daffodils and primroses, and hartstongue fern, add to its charm. It is, therefore, with some regret that we find it is proposed to restore it, though the work is intended to be one of preservation and not of reconstruction. The edifice has been examined by Mr. Kinnaird Jenkins, the diocesan surveyor. There are certainly indications of structural defects, but it is very much to be hoped that nothing more will be done than is actually necessary. It is quite a mistake to take out the stonework of windows in which there is no valuable glass until they are at the very last stage of decay. Every church which possesses old architectural features should have these carefully preserved to scale, on proper plans, and then, when in the last resort a window has to be replaced, there is clear evidence of its character. There is even yet a too great tendency to anticipate the work of time in our English churches, and to put in new work which is not needed for the purpose of structural preservation. To fill St. Just with new stone work would be to take away most of its charm. The name itself has a great suggestion of the picturesque, and of the luxuriant region in which the church is placed. It may be disagreeable to destroy pleasing allusions, but it is interesting to point out that "Roseland" has not the meaning which one would popularly suppose, but should be strictly "Rosland," which means moor or peat land.

The Shape of Swimming Baths. AMONG the illustrations we have given to Mr. Lever's interesting paper at the Architectural Association on the Port Sunlight buildings, is the plan of the open-air swimming-bath, which we have given because it is a suggestion worth attention in regard to the planning of swimming-baths. It will be seen (p. 313) that it is oval in shape. Swimming-baths are almost invariably made in a long rectangular form. Why should this be the accepted form? The result is that a practised swimmer, who could go many lengths of the bath without difficulty, has to stop and turn at each end. With an oval bath he could swim round and round without stopping. In baths where anything like an architectural treatment could be afforded, the oval plan would give scope also for a fine architectural effect, in a bath on a large scale.

THE ARCHITECTURAL ASSOCIATION.

THE usual fortnightly meeting of the Architectural Association was held on Friday last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., Mr. W. H. Seth-Smith, President, in the chair.

The minutes and nominations having been read, Messrs. A. W. Heath, R. D. Wells, and C. H. Wheeler were elected members.

On the motion of Mr. H. P. G. Maule, hon. secretary, a vote of thanks was accorded to Mr. F. E. Williams and to Messrs. Derry & Toms in connexion with the visit on the 8th inst. to the new premises in Kensington High-street.

New Premises Fund.

The Chairman said he had to announce the following additional donations to the New Premises Fund viz., Messrs. C. E. Bateman, 5*l.* 5s.; Noel F. Barwell, 4*l.* 4s.; W. J. N. Millard, 2*l.* 2s.; and D. F. Fyfe, 1*l.* 1s. The Chairman said he had pleasure in reading the following letter, received from Mr. Bateman:—"I have been much interested in following the subscription list for the new premises fund fol-

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owing upon your appeal for small donations' which, I think, you put in exactly the right way to encourage the younger members to give something from time to time, as they can afford it. I am sending you a guinea towards one of five guineas which I propose to spread over five years, and hope this course will be followed by others. Men do not care sometimes to give only a small amount when a larger sum is required, but we all know from experience that a big bill of extras may be made up of a number of small items. I hope you will soon have sufficient funds to justify a start being made. I was through the Day School recently, and should like to congratulate you upon the excellent work being done by the masters and students."

The Chairman also announced that a meeting of the Discussion Section would be held on the 18th prox., when Mr. A. Needham Wilson will read a paper entitled "A Tour through the South of France."

Mr. R. S. Balfour, hon. secretary, announced the following donations to the library, and a vote of thanks was passed to the donors:—"Summer Holidays Among the Glories of France," presented by the author, Mr. T. Francis Bumpus. "Monastic Seals of the Thirteenth Century," by Gale Pedrick, presented by Mr. Noel F. Barwell. "Proceedings of the Society of Antiquaries, 1900 to 1901," presented by the Society of Antiquaries.

Dwellings Erected at Port Sunlight and Thornton Hough.

Mr. W. H. Lever then read the following paper:—

When your Association did me the honour to invite me to read a paper on "The Villages of Port Sunlight and Thornton Hough," it appeared to me to be necessary before accepting your invitation that it should be clearly understood to be out of the range of my ability to treat the subject from the standpoint of the architect.

You were good enough to repeat your invitation after receiving this explanation, and now, if you give me your kind indulgence, I will endeavour, in as few words as possible, to render an account of the building, planning, and laying out of Port Sunlight, and of the partial re-building of the village of Thornton Hough.

Taking Port Sunlight first, its history is soon told. Our works were started in Warrington in January, 1886, and in the autumn of 1887, the site being found to be too small for our rapidly growing business, it was decided that the best course would be to remove entirely to some rural district where ample acreage could be secured adjacent to both rail and water transport, with reasonable facilities for obtaining the necessary supply of labour. To provide this a decision had first to be made as to which part of England was best suited to the particular manufacture it was intended to carry on. Rightly or wrongly, the River Mersey was selected as the best for our business.

Obtaining maps of the district, I next proceeded to examine, partly by walking, partly by taking train, the most likely localities, and finally settled on land on the Bromborough Pool, situated about five miles from the centre of Birkenhead, and about seven miles across the river from Liverpool Town Hall. The intention was to build works and village. The village was part of the scheme from its very inception. Our first purchases were about fifty-six acres of land, of which twenty-four were intended for the business and works and thirty-two for the village. From time to time the area was added to by purchase as opportunity offered, until to-day the area is 230 acres, of which about ninety acres are devoted to the business and 140 to the village.

The ninety acres devoted to the business are of no interest to us to-night, and therefore we will dismiss them and the buildings erected thereon from our thoughts, and confine our attention to the 140 acres devoted to the village.

The ravines or gutters, up which, to a greater or less extent, in former days the tide used to flow, we have filled up, and levelled the land at the bottom of the ravines, but only so as to raise it above high-water mark. This leaves the ravines available for use as parks and recreation grounds, and so treated they will become the feature of the village. At the junction with Bromborough Pool a dam is in course of construction, which will cut these parks off from the incoming tides, and also serve to carry a road at that point across the pool.

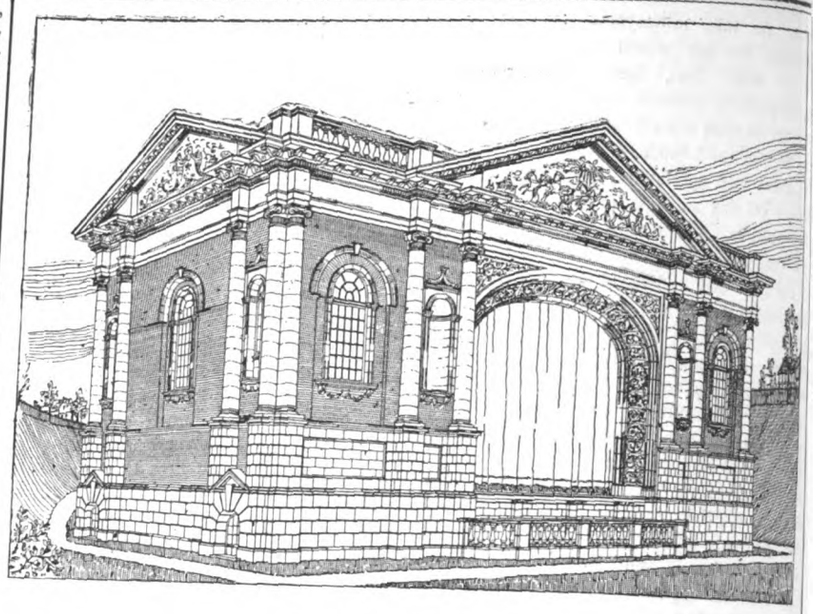

Fig 1.—The Auditorium.

Messrs. Grayson & Ould, Architects.

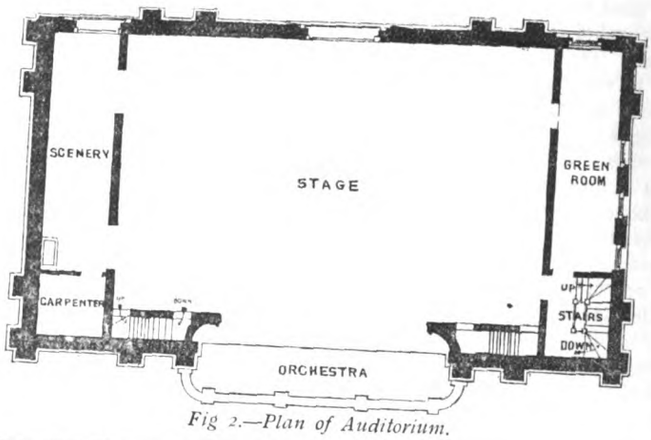

Fig 2.—Plan of Auditorium.

The roads have been so planned that whilst making direct and shortest ways to important points, such as the railway station, the ferry, the tramway terminus, and to the office and works, they shall still form wherever possible curves and sweeps following the lines of the ravines.

Another object aimed at in the laying out of the village has been that none of the houses should have their backs to the railway line. It is remarkable how little this is thought of in laying out building land adjoining railways, and yet I know of no feature of such an estate that ought to have more careful attention, both on the grounds of the financial success of such undertakings, and also in the interests of the public using the railways. The general width of the roads has been fixed at 40 ft.—say 8 yards roadway and 8 ft. each for footpaths, but our widest road is 12 yards for roadway and 12 ft. for footpaths. I don't know whether it is a recognised rule to make the footpaths as many feet wide as the roadways are yards in width, but I have always found this to give a most excellent proportion. In order to realise the intention of leaving the ravines as parks and recreation grounds, and at the same time not diverge from the directness of the roads to adjacent local centres, the ravines had to be spanned at several points, and with two exceptions where bridges have been built, this has been done by means of banks of earth. In building these bridges the intention has been to add distinct objects of interest to the village.

The first of the two bridges is the one near the schools, spanning the park at that point. It was designed by Messrs. Douglas and Fordham, of Chester, and forms one of the most charming features of the village. The second bridge carries Bolton-road across the ravine to its continuation to New Chester-road. This bridge was built from the designs of Messrs. William and Segar Owen, of Warrington, and it would be difficult to imagine anything more solid and strong, yet light and graceful. It is an ideal structure for the purpose for which it was designed. At the time the bridge was built we did not own and could not then readily acquire the land bounding the north-western buttresses of the bridge. The ravine, therefore, for many reasons, could not be spanned by an embankment. The necessity for the continuation of Bolton-road to New Chester-road was an urgent matter that could no longer be delayed. Hence the only solution of the difficulty was the building of the bridge, which gave us the outlet we required and rendered us independent of adjoining landowners, with the result that we were able later to purchase whatever land we required to the north of Bolton-road. Whether this would have been possible without the independent outlet being first created I cannot say; but if that had appeared to us to be possible, the bridge in all probability would not have been built, and the village would have lost one of its most striking features. The total area occupied by ravines is 121,000 square yards, or about 25 acres. Adjoining one of these ravines we are erecting a gymnasium using wood as the building material. In another, we are erecting an open-air theatre, which for want of a better name will be called the Auditorium (figs. 1, 2). The sloping banks of the ravine allow of a perfect arrangement of seats somewhat on the lines of the classic Greek theatres. Of course, I know it is somewhat risky to build an open-air theatre in this uncertain climate, but the view taken is this, that we may possibly rely on four months during which we shall find this theatre extremely useful, and as the cost of such an open-air theatre is certainly not more than one-quarter that of a fully-enclosed building, it appears to be a fairly economical arrangement. In addition, is it not desirable to cultivate more the capacity of our English climate for open-air summer amusement?

However, in any case it will be an interesting experiment. Adjoining another of the

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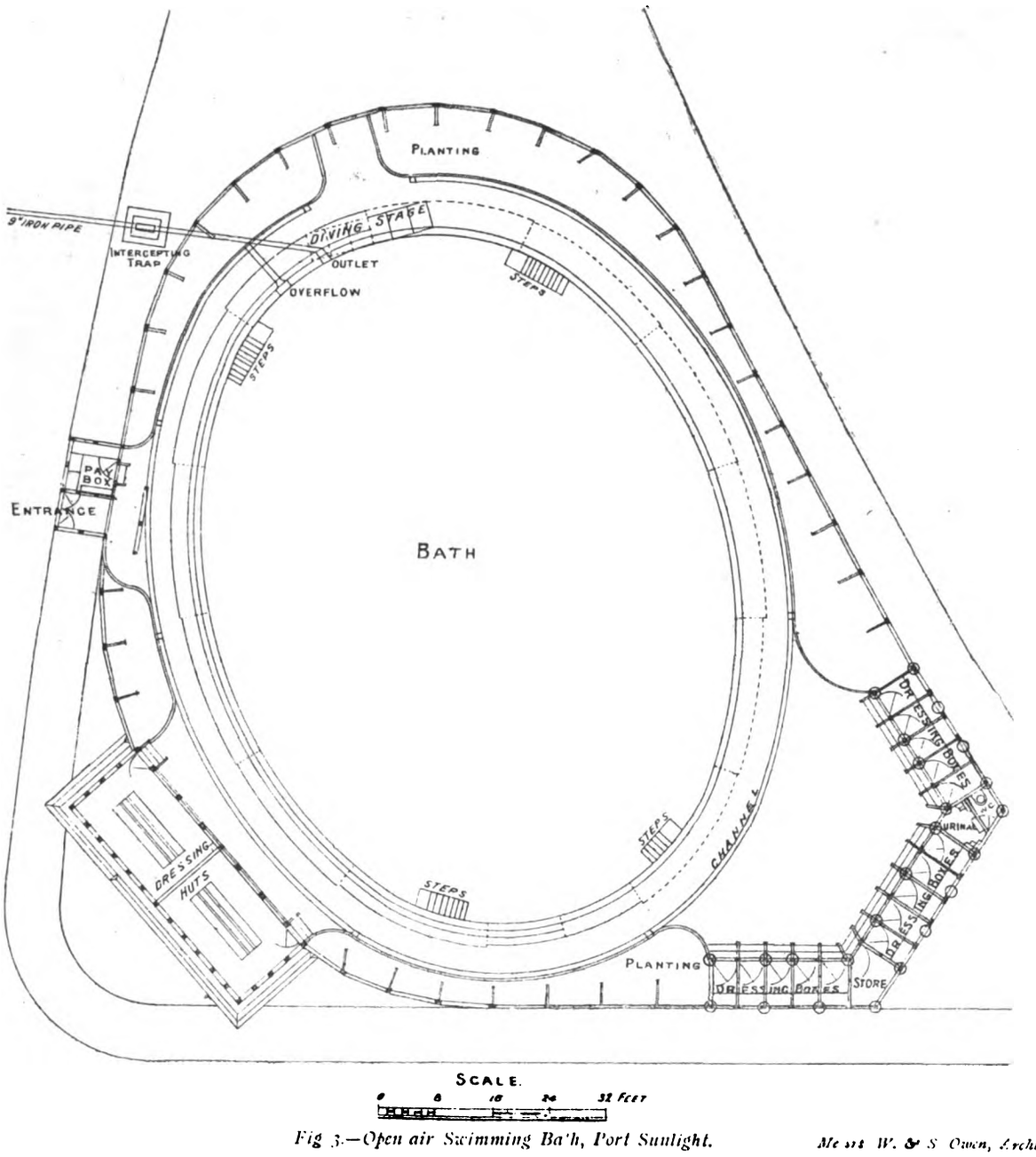

Fig 3.—Open air Swimming Bath, Port Sunlight. *Messrs W. & S Owen, Architects.*

ravines and occupying a triangular piece of ground that otherwise could not have been profitably used, an open-air swimming bath (fig. 3) has been made. The shape of the bath is oval; length, 100 ft; breadth, 75 ft.; 3 ft. deep at one end and 7 ft. 4 in. at the other; with wooden dressing-rooms placed in convenient positions.

What I may call the first public building to be erected at Port Sunlight was the Gladstone Hall, opened by the late Rt. Hon. W. E. Gladstone, in November, 1891. This, in my unprofessional opinion, is the most appropriate village hall we have. It is simple and unpretentious, admirably adapted for the purpose for which it was designed, and most suitable and appropriate for erection in a village. The tendency at Port Sunlight has been during the last few years for our architects to become more and more elaborate in architectural design, and more and more extravagant in the use of costly building material. Although this has been done with the most happy results in the majority of cases, I rather look upon such buildings as teaching merely what can be done with unlimited money, and whilst this is very right and proper in its own way, it does not teach us so useful a lesson as the more difficult one of planning and designing simple, beautiful, and inexpensive buildings suitable to village life and village means.

But Gladstone Hall has for long been too small for the needs of the village, and therefore an additional dining-hall has been built, at present devoted entirely to the use of the women and girls of the works and village. This hall is called Hulme Hall, and I certainly feel a little more at liberty to criticise it, since it was built from the designs of the same architects who designed Gladstone Hall, Messrs. William and Segar Owen, of Warrington, than whom no one have been more happy in their work at Port Sunlight, to whom also we are indebted for the quiet grace and beauty of the earliest buildings in the village which have given to it its distinctive English village character. Probably the difficulties connected with the size of Hulme Hall were greater than appear at first sight, the problem being to provide dining accommodation for not less than 1,500 people seated at small tables—say six persons at each table. The effect produced on one's mind by Hulme Hall is not that of a village building, but rather that referred to above as showing what can be done with unlimited money lavishly spent, which is, perhaps, the least useful lesson village architecture should teach. However, the hall answers its purpose most admirably, and should prove to be a centre of life for the village as long as the village is in existence. The cooking arrangements are most admirable and perfect. A happier or brighter spectacle than the hall at noon, with the hundreds of healthy, bright girls seated at the clean, neat tables, would be difficult to find.

At about the same time that we built the Gladstone Hall we built a block of cottages, with a shop at one end of the block. This shop is now used as the village post and telegraph office, and is well worth attention. The half-timber work in this shop is solid oak, employed, as nearly as the modern Building Acts will allow, in exactly the same way as it would have been employed had the shop been erected 300 years ago. The same remark applies practically to all the half-timber buildings at Port Sunlight, although there are, I think, one or perhaps two cases where this has not been strictly adhered to. The village stores used to be at this shop, but the growth of the village soon rendered it too small, and therefore large central shops were built from the designs of Messrs. Douglas & Fordham, of Chester. The site selected is at the corner of Bolton-road and Bridge-street, and the group of shops consists of grocery and provision shop, drapery and millinery shop, and butcher's shop. These stores are managed by the employees themselves entirely, and whatever capital is employed is provided by themselves, and whatever profits are made are divided amongst themselves.

Over the entire area of the three shops is the Girls' Institute, with large central hall and side classrooms, the latter formed by movable wooden screens, so that when required they can be thrown into the central hall. This is the girls' club of the village, and one of our most useful institutions. Sewing classes, ambulance classes, &c., are held here during the winter months, and in a lesser degree also during the summer. This institution does not quite correspond to the Men's Social Club, being a more educational institution than the men's club. This latter was built from the designs of Messrs. Grayson & Ould, of Liver-

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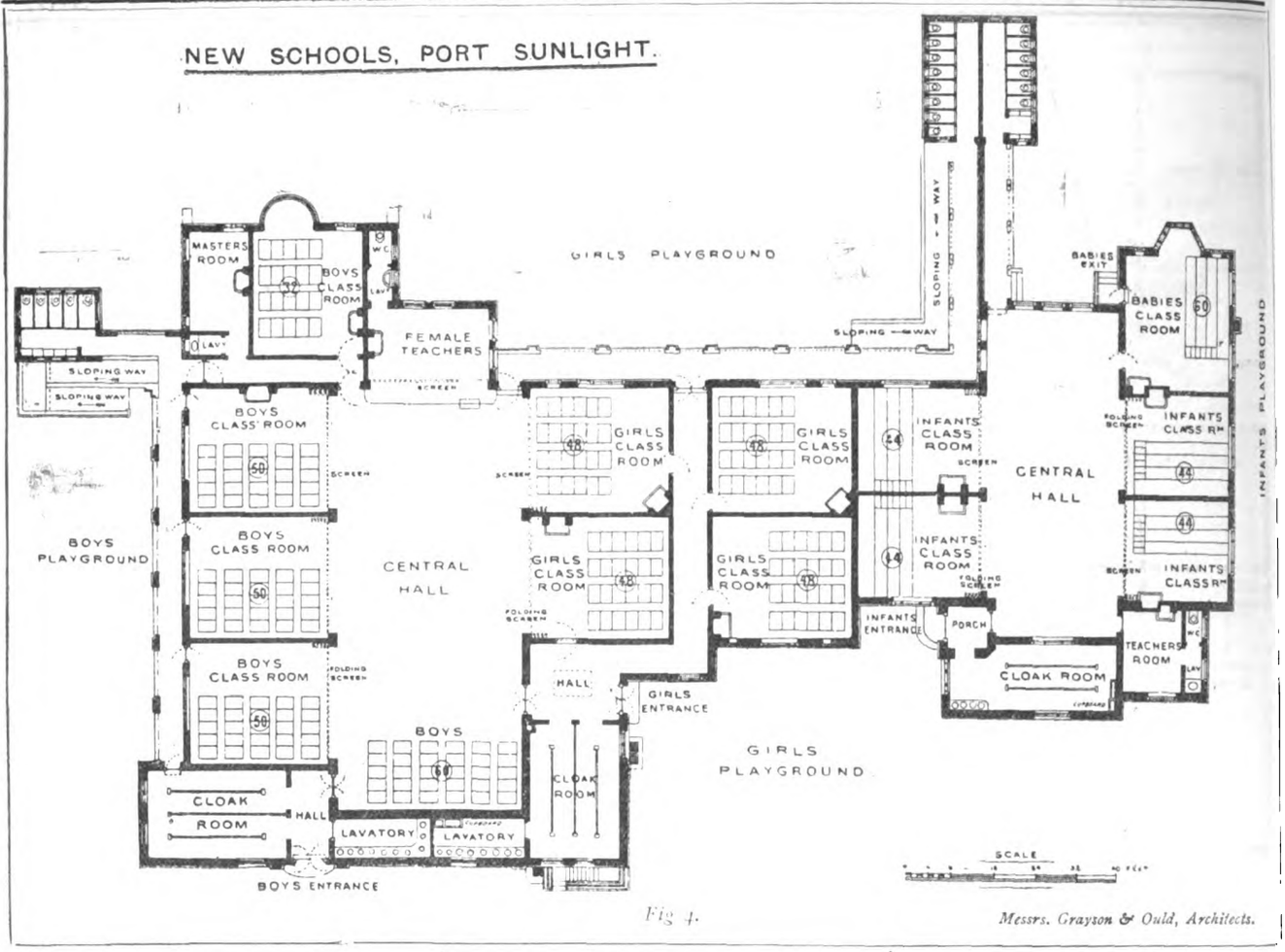

Fig 4. *Messrs. Grayson & Ould, Architects.*

pool, and has proved a most useful and successful building for its intended purpose. It contains the usual accommodation for billiards, games, reading, &c., inside, with a full-sized bowling green adjoining. Opposite the men's club is a range of buildings with a "past." Its present use is as an addition to the school accommodation of the village. Prior to that it was used as a girls' restaurant on the first floor, with small confectionery shop, estate office, and caretaker's rooms on the ground floor. Earlier again the first floor had been divided, as in those early days one half was found to provide ample accommodation for the girls' restaurant, and the other half was available for, and was used as a junior social club. None of these uses, however, is the original one for which the building was designed and built, which was to provide a series of four homes, each with twelve cubicle bedrooms, and with bathrooms, parlour, living-room, kitchen, and all the necessary equipment for accommodating a total of forty-eight girls, being twelve girls in each of the four homes, with provision also for matrons and staff for each house. The charge for this accommodation was 2s. 6d. a week for each girl, and this included everything except washing of the girls' wearing apparel and cost of food. This charge was based upon the cost to the girls of the cheapest and usually very inferior lodgings to be obtained in the worst and most crowded adjoining districts. However, the girls objected to the idea altogether. The homes never attracted more than a dozen girls at one time. Finally they had to be closed and adapted for other uses. I believe the girls' objection was due more to the suspicion they had that they were being asked to live in what appeared to them an institution, and probably also to the ridicule of other girls, than to any other cause. They were making a respectable living, and their womanly pride preferred to be independent, and to find their own lodging accommodation with some working man's family.

But the buildings of which we are most proud at Port Sunlight, both architecturally and otherwise, are the school buildings, built from the designs of Messrs. Douglas & Fordham. All the social work of the village centres round these buildings. Undenominational Divine services are held here on Sundays by our resident minister, the Rev. S. Gamble-Walker. They are used also as Sunday schools on Sunday afternoons, and as day schools on weekdays. In addition they are in constant use for social and educational functions on week-nights. Additional schools are now in process of building from the designs of Messrs. Grayson & Ould fig. 4), which, when completed, will raise the school accommodation to a provision for over 1,500 scholars. A church is also being built, from designs by Messrs. William & Segar Owen. I would like to describe this church to you but I am afraid that if I attempted to do so you would be wearied by my inability to clearly convey a correct idea of it to your minds. I can only say that the aim and intention has been to produce an honest piece of work, worthy of the purpose for which it is intended, with every detail, both inside and outside, speaking of thoroughness and truth, and with such ornament only as would add dignity to the building and produce a feeling of reverence in those worshipping within or viewing it from without.

I must not forget to take you to our village inn—called Bridge Inn—built from the designs of Messrs. Grayson & Ould. It is unlicensed, and it is not intended to apply for a licence for the sale of intoxicants, and it is one of our most successful and useful buildings, providing easily day accommodation for many hundreds of visitors, with a few bedrooms sufficient to meet all the demands of visitors requiring to make a longer stay in the village. Considering the difficulties to be overcome in securing all that was demanded of the architects at a cost within the means placed at their disposal, this is certainly one of the successes of the village.

And now, before leaving Port Sunlight and proceeding to the little village of Thornton Hough, let us examine the various types of cottages built at Port Sunlight. We have really two standard types only—the cottage and the parlour house—although we have some half-dozen cottages which have less accommodation than the standard type of cottage, and perhaps a dozen houses, occupied by our clergyman, doctor, schoolmaster, managers and heads of departments, which provide specially for those they were designed and built to accommodate, and present no special variation from the usual villa or moderate-sized family house.

We will, therefore, pass these exceptions over, and devote ourselves to the consideration of the standard type, which really is the type for 97 out of every 100 houses. In planning the standard type the idea has been, firstly, to provide a garden as foreground to the cottage and screen from the road. These front gardens are in every case kept in proper order and cared for by ourselves. We have found by experience that no other plan is successful in securing a character to the village, and avoiding the unsightliness of here and there the obtrusion of neglected plots of garden which would mar the whole effect. This care by ourselves of front gardens is effected at a cost of 3d. per garden per week. In addition to these front gardens we have also allotment gardens to almost each block of cottages. These allotments the tenants cultivate themselves as vegetable gardens, or properly fence and use for poultry, &c. These allotment gardens are placed as near as possible to each cottage, and are the very safety-valve of the village. Their use and appreciation by the villagers speaks more eloquently than any words of mine could do of the absolute need for such means of healthy recreation.

The accommodation in the cottage type (fig. 5) provides for three bedrooms upstairs, and living-room, kitchen, scullery, bathroom, and larder on the ground-floor, with enclosed yard and usual outbuildings. Our experience leads us to believe that any variation from dimensions chosen has not been popular with the villagers. If the rooms are made larger it entails more work on the wife than she is able to devote to their care, and therefore the house soon loses its tenant. On the other hand, if the rooms are smaller, they will not accommodate the necessary furniture, with a like result. In fact, a workman's cottage must fit like a glove the wants of a tenant if it is to be a successful attempt to provide for the happiness and comfort of himself, wife, and family. Having settled by experience the most suitable type of cottage, it has been adhered to in all the cottages at Port Sunlight and Thornton.

The parlour cottages differ from the ordinary cottages in having an additional bedroom on the first floor and a parlour on the ground floor. In a few cases the scullery in these houses has been fitted with a kitchen grate, so that all the cooking could be done there, leaving the kitchen to be used as a dining-room. The general type adopted for the parlour houses has proved popular, and therefore has been settled upon as permanent.

The financial aspect of the village at Port Sunlight is soon told. The capital it has taken to buy the 140 acres of land, build the cottages,

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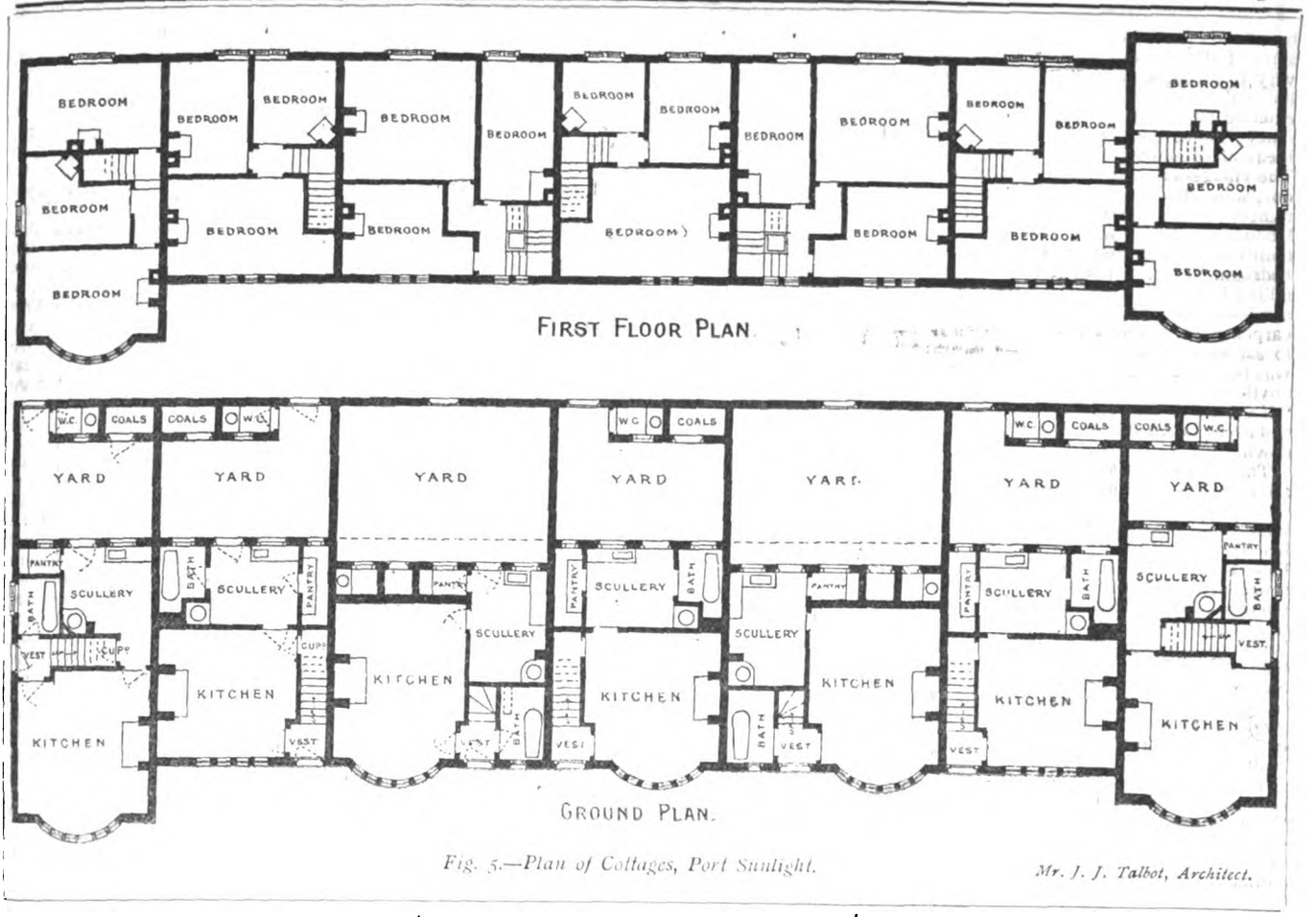

Fig. 5.—Plan of Cottages, Port Sunlight. *Mr. J. J. Talbot, Architect.*

houses, schools, shops, institutions, clubs, &c., and including making the roads, laying out the parks, &c., has been over 350,000*l.*

Our standard type of cottage thirteen years ago cost us 200*l.* each to build, and identically the same cottage in 1901 cost us 330*l.* to build. The parlour houses cost us then about 350*l.* each to build, and now about 550*l.* each.

Upon this 350,000*l.* Lever Brothers, Limited, receive no interest or return whatever, the rents being fixed at such an amount as only to pay for rates, taxes, repairs, and maintenance. The rents have had to be increased from 3s. per cottage per week to 5s. per cottage per week, owing to increased cost of maintenance of parks and roads, and of the cottages themselves. The cost of repairs has gradually grown to extravagant proportions, owing to the fact that every tenant has been allowed practically any repairs he asked for. This was allowed, because the tenants as a whole paid the total cost of repairs and maintenance, but this system does not bring it so clearly home to individual tenants that extravagance in requests for skilled workmen for trivial repairs is expensive. There are clear indications shown by the reduction in the number of such requests during the last six months that the last raising of the rents is having a good effect. From our experience, therefore, it appears that with the most economical expenditure on repairs and maintenance the rental of a cottage to cover rates, taxes, repairs, and maintenance only would be 3s. 6d. per week, and of a parlour house 5s. 6d. per week, and that out of such rental nothing would be available as interest on capital outlay.

Taking the value of the land at 240*l.* per acre, and taking ten cottages per acre as the maximum number possible per acre, after allowing the proportion of each cottage for parks and recreation grounds, we should have a total cost for cottage and land of 354*l.*, which at 4 per cent. interest and 1 per cent. depreciation (in addition to cost of maintenance already provided for), is, say 17*l.* 14s. per cottage per annum, or say 6s. 10d. per cottage per week. Adding this to the cost of rates, taxes, repairs, and maintenance, we have a rental of 10s. 4d. per cottage per week as the letting value of the cottages of Port Sunlight on an ordinary commercial basis. Taking the rate of interest at 3 per cent. and of depreciation at ½ per cent., the sum of 4s. 9d. per cottage per week would be sufficient to meet these, and consequently a gross rental of 8s. 3d. per cottage per week would be sufficient.

My object in mentioning this is to draw attention to the fact that to build a village such as Port Sunlight is not commercially possible at the present time. To ask either of the above rents would be to place the possibility of living in such a village out of the reach of ordinary village tenants. How can the difficulty be met? There are only two possible channels of reduction—cheaper land and less expensive buildings. The value of the land for cottages is fixed by the number of cottages the law allows to be built upon it. If the legal maximum were twelve cottages per acre, as it ought to be, it would be impossible for land for cottages to reach a higher value than twelve cottages would bear. The present Building Acts allow of forty-five cottages being crushed like sardines in a box on one acre of land. The effect of this absence of proper restrictions operates in all cases to the raising of the value of the land. In Liverpool this is seen by competitions amongst builders themselves, who elevate to the level of a fine art the study of how many cottages can be squeezed upon a given area. The ingenious builder who can see his way to squeeze the most houses on a given plot of land sees his way at the same time to give the highest price for the land and so to secure it. The only remedy is the restriction of the number of cottages to be built upon a given area of land—to say twelve cottages per acre. This will allow 400 yards of land for cottage and garden, and proportion of roads and open spaces for parks and recreation grounds. This is the maximum limit possible for maintenance of healthy life. A limit of ten cottages per acre, or 480 yards per cottage would be better.

The next consideration is the cost of building, and I venture to suggest that there is here a magnificent field worthy of, and awaiting the attention of, our best architects. This subject should not be left to the unaided efforts of what we often thoughtlessly call the jerry builder, a man who is, in my opinion, a most useful member of society—more sinned against than sinning. The so-called jerry builder has to make the most of an almost impossible position—to satisfy the demands of the public for cheap dwellings, regardless of consequences—and I maintain that, building upon dear land, he does all that can be done with the materials at his disposal. If our best architects would only come to his assistance by studying the present day requirements to be provided for in dwelling houses, the cheapest and best materials for the purpose, the preparation of the same by machinery, as far as possible, rather than by hand-labour, to study the saving to be effected by the erection of dwelling-houses in large masses rather than singly, and to do so with greater effect and less monotony than by building as at present; in fact, to raise architecture in relation to the dwellings of the million on to broad, comprehensive lines, so as to rest on the only true basis that architecture can ever occupy—the supplying of the requirements of the age with economy, simplicity, and character. Modern domestic architecture requires to adapt itself to the requirements of the twentieth century, in the same way that naval architecture has done in shipbuilding, and to accomplish as much by disregarding traditions, as to building materials, in supplying the demand for dwellings for the masses of the people, as naval architecture has done by disregarding traditions, as to shipbuilding materials, in supplying our present-day demands for ships.

We know that for certain buildings which must be monumental and important we are not likely to discover better building materials than stone, granite, or marble. But dwellings for the masses of the people need not be monumental. If they can be inexpensively built to stand absolutely sound, weather proof, and sanitary, for, say, fifty or sixty years, they will better supply the present-day requirements than if, by increased cost, they were built to stand good for 300 years. The changing life of our citizens, the necessity that is laid upon them to follow their employment wherever it may lead them, and the fact that our experience teaches us that in fifty or sixty years the site of cottages may in all probability be wanted for other purposes—all point to the present-day requirements in cottages being not for cottages to stand hundreds of years, but tens. Understand I am not speaking of the building of villas or mansions, say, from 70*l.* a year rent and upwards. I only refer to cottages, and what for want of a better word I may call "parlour houses," the rentals being from a few shillings a week to say 30*l.* or 40*l.* a year. I know of no greater service the architects of the country could perform during the new century than the designing of economical cottages and small houses, unfettered by tradition as to material to be used, and guided only by the wants of the age for economical, sanitary, healthy houses, to endure for fifty or sixty years only.

We will now pay a short visit to the village of Thornton Hough. Here the problem was not how to build an entirely new village, but

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how to rebuild an old one. The exteriors of some of the old cottages in the village were very picturesque when seen in fine weather, but unfortunately, the more picturesque the exterior appearance, the more dirty, dark, damp, unhealthy, and at variance with all ideas of common decency, was the interior. The villagers in many instances, but not every one, were attached to these old ruins. I well remember one case where the tenants, a farm labourer and his wife, had brought up a family of ten children in a cottage with one bedroom only. The thatched roof was falling in and the walls were bulging out. A son-in-law of the tenants was the village carpenter, and I referred the old lady to him to satisfy her that nothing but pulling down was possible. He expressed his inability to do anything, saying in his own emphatic way, "If yer touch the roof ye'll push the walls out, and if yer touch the walls ye'll have the roof down."

This unwillingness to move did not apply to all cases. I remember one tenant, a widow woman with one son, asking me if I could not build her another bedroom to her cottage, as her lad was growing up now and they had both to sleep in the same room. She then proceeded to inform me that he was over twenty. There were other cases even worse than this as far as mixing the sexes in single bedrooms was concerned, and cottages worse than the one with roof and walls falling down. Such cottages were the most picturesque externally. However, all difficulties in the end were overcome. Only the irreclaimable cottages were pulled down and new cottages built in their place. Cottages offering the slightest possibility of reformation were altered, repaired, and adapted to modern requirements. The new cottages were not always built on the site of those pulled down, but as far as possible this was done, so as to preserve the general outline of the village.

A score or more of additional cottages have been added to the village to supply the growing need of the agricultural and farm labourers of the parish.

I have confined the tenancy of the cottages to the village labourers, and in consequence have only about 1 per cent. of direct return on the investment. I have, however, the satisfaction of knowing—if that is any satisfaction—that, under present building possibilities however "jerry" and however plain and ugly I might have built, at the rentals which village labourers can afford to pay, the result as an investment would have been little different. To raise the rents would, in the majority of cases, be to force the original village population away, and to replace them with a different class of tenant entirely. But, indirectly, I believe I have full and ample return, partly in the value of the farms I have in the parish, which would be seriously depreciated if farm labourers could not be housed in the village; and, secondly, in the pleasure it has given to me to do what it appeared to me ought to be done for those living in the village.

Messrs. William & Segar Owen, of Warrington; Grayson & Ould, of Liverpool; and Douglas & Fordham, of Chester, are the architects I was fortunate enough to secure to design and carry out the work. The same general plan or type of cottage has been adopted at Thornton as at Port Sunlight, and the same provision for gardens and recreation grounds has been made.

And now allow me to explain, in order that you may understand my position and work better, that I have always wished that I had been an architect. I have been building since when, at nine years of age, a lean-to rabbit hutch absorbed all my spare time for that year. The following year this rabbit hutch appeared to be capable of extension, and it was pulled down and rebuilt on a more extensive scale, allowing a number of small boys to stand upright inside the hutch. The third year saw a further development in carrying out a startling idea, that of covering the roof with soil to the depth of about 6 in., and planting oats therein, with the object of raising food for the ever-increasing stock of rabbits. But, alas! "the best laid plans of men and mice gang aft agley," to say nothing of those of architects and builders, for although the corn grew luxuriantly in the early spring, it all withered away in the summer heat, and so this economy of space, which, had it proved practicable, might have done so much for distressed agriculture, had to be abandoned. Nothing discouraged, as far as my building instincts were concerned, the year following I built a pigeon cote, and so on, each and every year finding me engaged in some building operation, right up to the present time.

Gentlemen, there is no career that opens up such immense possibilities for influencing the world in which we live as that of the architect. The best and most reliable records of the earliest stages of civilisation in the world are architectural. It is true we have the stone and flint implement age, but although they teach us that their users were able to protect themselves from foes, we learn little of their higher or home life. In the case of the cave-dwellers the incipient craving for buildings does show itself, it is true, but only very slightly. It is not until the first architect appears on the scene that man comes within the reach of a higher life. There can be no possibility of doubt that the architect was the first and most important link in the chain of art workers that have raised us to our present state of civilisation. The art of the painter is a most important one, but it is clear that until there were suitable buildings in which to place them, paintings on walls or canvas were impossible. And yet, architecture is one of the least remunerative of the professions. If an architect does his duty to himself and client, and supplies full necessary detail drawings to the builders; if he carefully and conscientiously supervises the progress of the building during erection, he will have a very small sum left for his own personal remuneration after paying the salaries of draughtsmen and assistants. And it is to the credit of the architectural profession that it does contain a body of men who maintain a high level for their profession, as free as the requirements of life will permit from unworthy thoughts of personal remuneration. And with a very few exceptions this appears to have been always the case with architects in all countries and all ages.

Why it should be so I fail to see, yet it does appear to me from my own observation that, attention once directed to money-making as an aim and object, art vanishes. No, if money-making is to be the aim and ambition of life, then leave architecture and become soap-boilers, sugar-boilers, cotton-spinners, manufacturers, bankers, shipowners, merchants—anything and everything almost. It is true many of these latter reach the Bankruptcy Court, and I hope few architects arrive there. Still, if money-making is the highest aim of life, then architecture is not the calling to follow. But money-making is not the highest object of life, but service to our fellow men, and in my humble opinion an architect's career is one of the most serviceable in the whole range of honourable callings.

Since it has not been my good fortune to be trained to the honourable profession of an architect, and since my instincts all lead me in that direction, I have had to be content to follow, but at a most respectful distance, in the company of architects, and to build under their guidance and direction what little building I have done. No doubt I have led them into many errors by insisting on my own way being followed as against their trained and mature judgment. None the less on that account I hope to remain always on the most friendly footing with all architects, and that my love of the profession, with a life-long devotion to its aims and ambitions, will make them

> "To my faults a little blind,
> To my virtues very kind."

For myself, I thank most heartily and sincerely every architect who has carried into effect, and freed from their native blemishes and defects, and made beautiful, my own crude and untrained ideas.

Mr. G. H. Fellowes Prynne, in proposing a vote of thanks, said it was very refreshing to have a layman like Mr. Lever give them such a charmingly-illustrated paper, and to have had it put in their hands beforehand, and thus to have enabled all to follow the lecturer as he read, must have added greatly to their pleasure. The little peep they had had of Port Sunlight—a very appropriate name for the place—showed them a development far and away beyond anything which had been done before, and Mr. Lever was to be congratulated on his work—and his architect also, judging from the sketches of the buildings erected. To combine philanthropy and business, as Mr. Lever had done, for the mutual benefit of himself and those working about him, was one of the highest ideals that a man could have. When one went through the dreary, dingy, manufacturing districts of our country, and the dreary, dismal parts of our metropolis, it was a pleasure to hear of a man coming forward, though engaged in business, and trying to raise somewhat the dreary lot of the people who worked in such conditions. Mr. Lever had not only thought of the ordinary living needs of the people; he had also provided gardens and allotments at the back of the houses. If there was one thing more than another which could help to elevate men's minds it was the opportunity of cultivating that innate love which we all have for flowers, and also that natural desire to raise something from the soil. What was more, the people seemed to appreciate what had been done. Nothing was more likely to raise the noblest instincts of man in his leisure hours than the teaching of Nature. There must be many difficulties which people doing the work Mr. Lever had set his hand to had to face—social, political, and religious difficulties, and he (the speaker), judging from what he had said about undenominational Divine service, would have thought the religious difficulty was likely to be the most serious. Was the church, the plan of which seemed hardly satisfactory, designed for undenominational service? In his remarks, however, about the church they were erecting at Port Sunlight Mr. Lever rose to a sublime height, and he could think of no higher sentiment or aim for any church builder or architect than was contained in those words. One practical matter was put before them very conclusively in the paper, and that was the extraordinary increase in the cost of buildings in recent years, and those of them who had practical experience in the matter could confirm that. An increased cost of 65 per cent. in thirteen years was enormous. In regard to the Port Sunlight scheme, they could not suppose that away from the business adjacent to these houses the movement would have been such a success. Mr. Lever's advice as to building houses to last for fifty or sixty years might have its good points, but he (the speaker) did not think they would quite agree with Mr. Lever. As architects they felt they ought to build even a cottage as well and soundly as they could, at the same time with characteristic simplicity, and with the present-day regulations which were forced upon them, buildings were not likely to be insanitary. He quite saw Mr. Lever's point, *i.e.*, that cottage buildings, however well built, were likely to be removed after a short time, but that was also the case with many large houses which had not been erected long. They must all feel very much indebted to Mr. Lever for his kind and courteous words of appreciation of architecture and architects. Too often appreciation on the part of clients and the public of architecture was wanting, and the greatness of their art was not recognised as it should be. If architects had a high aim in their art, they must congratulate Mr. Lever on having a higher aim in his work, *i.e.*, the object of trying to raise the lives of people and making them happier and better, and they could congratulate him on his work.

Mr. H. T. Hare, in seconding the vote of thanks, said the Association was fortunate in having had such an interesting paper from a layman, whose ideas were so untrammelled. Messrs. Lever Bros. had had a magnificent opportunity in this scheme, for, as far as could be judged by the plan of the estate, they had secured a piece of ground which, with its levels and the inroads of the sea, was admirably suited for laying out in a picturesque manner, and it was greatly to their credit that they had made such a selection, because if it had been an ordinary estate, with a flat and uninteresting surface, it would have been much more difficult to have laid it out satisfactorily, and in their selection Messrs. Lever Bros. must have seen the possibilities of the site. The manner in which the roads and the estate generally had been laid out seemed altogether admirable and picturesque, and the buildings were certainly far ahead of anything which had been done before in connexion with a manufacturing village. The only estate which he could call to mind which was at all analogous in regard to the character of the buildings was the Bedford Park estate near London, but those buildings were erected under entirely different conditions, and there was no connexion with manufacturing. Messrs. Lever had had sufficient foresight to realise that it was not neces-

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sary for each building to pay 5 per cent., and he was quite sure that, though they did not receive an adequate financial return directly from the letting of the houses, they must feel the benefit resulting from their workpeople living in sanitary, well-built, and beautiful houses, and it must have a great tendency to elevate the moral character of the whole of the people on the estate, and it must attract better workpeople. He supposed that crowding was practically non-existent. One of the most interesting features on the estate was the open-air theatre, which seemed to promise a great deal. It was a pity more attempts of the same kind were not possible in England, and, notwithstanding our treacherous climate, there were two or three months of the year when open-air theatres were possible, and it seemed to him that there were many places in England where the open-air theatre would be possible and very desirable, and he hoped the Port Sunlight example would be followed and that more open-air theatres would be established in England. As to the cost of buildings, he was afraid Mr. Lever had put before them an almost impossible ideal, and he did not think an architect could ever hope to compete with the jerry builder as to price, even though he might use his ingenuity to the utmost and economise in every way. At the same time, he believed there was a great deal to be done in the way of cheapening building, and if a greater amount of thought were given to the subject of cottages and small buildings they could be much more economically built than they are now. Mr. Lever said he had always desired to be an architect; he thought Mr. Lever might congratulate himself that he was not, for he was in the fortunate position of being able to admire architecture without having the worry of designing it. Moreover, it was most probable that had Mr. Lever been an architect Port Sunlight would not have existed, and, therefore, they might congratulate themselves that Mr. Lever is what he is.

Mr. Sydney Vacher said they could not compare the building of cottages erected by architects under the ordinary conditions in rural districts with the cottages erected by Mr. Lever for his workpeople at Port Sunlight, where such magnificent accommodation had been provided, not only in roomy cottages, but in schools, halls, gymnasia, and other public buildings. In a village like Port Sunlight the drainage, water, gas, &c., used at the manufactory existed for use in the village, and the cost of these matters being reduced, the problem was a comparatively easy one. Had Mr. Lever succeeded, by giving his workpeople such splendid accommodation, in counteracting the ill effect of trade-unionism? In regard to the housing of the working classes, he felt that the railway companies could provide satisfactory accommodation near the great centres at a reasonable rental, and a rental which would give a fair return on the outlay. All around our big cities the railway companies could get land at a minimum price—land which at present had no approach—on which they could lay out and build villages for the working classes, whom they would carry from the villages to the towns. If that were done on a sufficiently large scale, and on a well thought-out scheme under a competent architect, it would provide satisfactory accommodation for the working classes. What Mr. Lever had done he supposed the railway companies could do at probably half the cost, for the transit of material for the construction of the buildings would be reduced to a minimum, brickfields could probably be started on some of the companies' land adjoining the railway, and the bricks and tiles required could be made at a minimum of cost, and in that way there might be a solution of the difficulty of how to provide accommodation for the working classes near the towns, but yet in the country. Mr. Lever might be able to tell them what was the effect on the health of the people of this large village at Port Sunlight, and the generous amount of land given for cultivation to each cottage—what was the percentage of illness to the ordinary population of other manufacturing towns where kindred industries were carried on.

Mr. Anderson Graham, editor of *Country Life*, said he thought the old building by-laws had been a very great obstacle to the building of good country cottages. Those by-laws had now been abolished, but it would be interesting to know from Mr. Lever if they had interfered in any way with the provision of the necessary accommodation that was required at Port Sunlight. It was an undoubted evil that at the present day we had in England great towns like London, Manchester, Liverpool, Glasgow, and Edinburgh growing to such an enormous extent, while at the same time the country districts were really becoming depopulated. It had often been suggested—and Mr. Lever, at Port Sunlight, had shown that the suggestion was a practical and good one—that some industries might be suitably transplanted to the rural districts. He thought there might be a very large number of such settlements, and that there could be no better model than Port Sunlight. He had been interested in the matter of providing dwellings in the country for the labouring classes, and what Mr. Lever had said had filled him with a certain amount of despair. His friend, Mr. Wilson Fox, of the Board of Trade, had shown that the average rent an agricultural labourer was able to pay for his cottage was 1s. 6d. per week. How was it possible to provide cottages that would pay at that rental? Landlords could not be expected to do it, for they had been losing on their land for years, and agricultural depression was no fanciful affair. A great many landlords had experienced a dead loss on their land, and were quite unable to build cottages for the labourers—though no doubt some could, and some actually had erected fine cottages at considerable expense, which were generally rent free. The problem was how to provide a cottage for an agricultural labourer at a rental which he could afford to pay? He would like to know from Mr. Lever somewhere about the average wage earned by the tenants of the cottages on the estate. Mr. Lever had worked out the rent of those cottages at about 10s. per week, which did not include cost of management, and the question was, what wage should a working man receive in order to be well able to pay a rental of 10s. per week for his cottage? The matter was important, because if cottages were to be erected on a sound business basis rather than a philanthropic one, they would have to be put up at a price which would allow a rent from which a fair return of capital would be possible.

Mr. W. B. Hopkins said he was disappointed to hear that the cottages at Port Sunlight did not pay interest on outlay. No doubt the comparative expensiveness of the artistic finish of the houses had had a good deal to do with that, but the second reason given by Mr. Lever deserved attention—*i.e.*, the cost of the land. He would like to ask Mr. Lever what he thought of the Garden City Association, and their attempt to keep down the first cost of the land (on which they hoped to erect towns and industrial villages) to little more than the cost of agricultural land. As to the by-laws, they had heard a great deal from one quarter and another of the advisability of reducing the stringency of them, and there were certainly by-laws the stringency of which might be reduced without injuring the man for whom the by-laws were created—viz., the occupier. If, by reducing the stringency of the law, the sanitary minimum were also reduced, then the by-laws had better not be altered. He asserted that the by-laws ought to be made more stringent as to the minimum of the amount of the ground on which a house and a certain number of people could be placed, and felt, with Mr. Lever, that the minimum ought to be increased. He was, moreover, convinced that such a restriction applied throughout the whole country would tend, not to enhance, but possibly to reduce, the price of building land, while it would absolutely certainly improve the sanitary conditions of life.

Mr. Francis Hooper said he would like to know from Mr. Lever whether that gentleman stipulated that only his workpeople should occupy the cottages he had erected, and, if so, what proportion of his workpeople occupied such cottages? Mr. Lever seemed to have solved an economic problem, for in spite of what he had done for his workpeople he had prospered himself, and had proved that it pays to take care of the workers. He thought it was also confirmed in other directions that better work was done by people who were well housed and whose general conditions were looked after. It was interesting to hear what Mr. Lever had done for the recreation of the people; railway companies, in their housing schemes, rarely did anything in the way of providing swimming-baths, theatres, schools, &c.; there was no doubt that many young people left the quiet village life for the excitement and amusement of the large towns, which they thus helped to overcrowd; and by seeking to amuse the people in the village, as Mr. Lever had done, they were kept from drifting to the towns. How were his gymnasia and theatre carried on and conducted? Were there men in his employ who undertook the management, or did Mr. Lever provide gymnasium instructors, &c.?

Mr. H. A. Satchell said no doubt criticisms would be made on the paper to the effect that the scheme described was too utopian to be of general application; but it would be a great pity if any one went away with such an idea. There were two absolutely distinct problems in regard to housing the working classes, viz., the housing of the manufacturing class, and the housing of the agricultural labourer. Mr. Lever had in no way attempted to solve the problem of housing the agricultural labourer, which was a very large question and embraced the whole subject of the treatment of agriculture in England. In connexion with the improved housing of the artisan class, he (the speaker) recalled an account he had read of the beginnings of such a movement, initiated by the Waterbury Watch Co. some years ago in America. That company laid down carpets in the rooms where the girls worked and put flowers in the windows, and, in answer to the charge of extravagance, they were able to show that these adornments paid for themselves several times over in the increased and improved production of the workers. Such movements were not merely philanthropic, but produced material as well as ideal results. We heard a great deal nowadays of the attack on England's commercial supremacy by the huge American Trusts. If anything could defeat this invasion it would be by following Mr. Lever's example in improving the conditions of the workpeople, and so obtaining increased results from their labour. In that connexion it was to be hoped that Mr. Lever would have the opportunity of reading such a paper before his fellow manufacturers or the Chamber of Commerce itself. Could he but impress others with his ideas they might be induced to follow his lead to the advantage of the nation generally, and of architects in particular.

Mr. J. T. Arundel said he had had the pleasure of visiting Port Sunlight and Thornton Hough, and what pleased him most was to see the healthy children and to note their eager desire to receive a smile from Mr. Lever as he went among them.

Mr. A. T. Bolton said Mr. Lever had dealt with a subject which ought to occupy their minds very much at the present time. It was all very well to say, with Sir Christopher Wren, that architecture is eternal and you ought to build for it, but it never was so historically, so far as the housing of the mass of the people was concerned. There was nothing more interesting or more extraordinary than a visit to the sites of some of the great metropolises of the past. Take Memphis, for instance, when you walk over the desert sand it is hard, indeed, to believe that here was once a capital of, perhaps, 1,000,000 inhabitants. All these great centres had been resolved into dust, and sun dried bricks was the secret of so complete a loss, and, therefore, he held that Mr. Lever was right in pointing out that what architects had to do was to meet the conditions of the hour, and try and relieve the aspect of towns given over to distressing, monotonous, jerry-built houses, run up purely on a financial basis to bring in a certain percentage. He was afraid that Mr. Lever's suggestion as to limiting the number of houses put on a given area of land was calculated to defeat his own object. If they made it unlawful to erect more than a certain number of houses on that land, he did not see how that could lower the cost of the land; it really would increase it, for the only result would be that it would be more economical to build four or five storied buildings—flats, in fact, such as were erected on the Continent for housing the bulk of the population. The greatest blessing about our monotonous, jerry-built suburbs was that at any rate the people were spread out, and that whereas in Paris the same number of people would be spread into a quarter of the area, in this country a man had a chance of having the open sky over his own roof. Therefore, any limitation of the number of houses put on a given area ought to be very carefully considered, because, beyond a certain point, such a limitation would put up the value of land and make building more expensive. To restrict the market was to make things dearer. Mr. Lever had shown a remarkable appreciа-

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tion of the conditions of the problem for a layman when he ventured to criticise his friends the architects by saying that they had shown a tendency to depart from what they were asked to do, which was to build village architecture. Any one who knew anything of old cottage architecture and had seen something of the various model estates which had been built would sympathise most fully with him. Mr. Lever's point amounted to this, that in the old country cottages, built by the people themselves, there was not that elaboration of detail and those architectural features which were to be found in the palaces and houses of the nobility. We do not want in village architecture what is sometimes to be seen in estate agents' windows and on ducal estates, *i.e.*, miniature Hampton Court Palaces boiled down to the dimensions of a cottage. It was not the practice of the Middle Ages to provide every cottage with a twisted brick chimney, and to introduce them now they had to be of terra cotta and, say, one-third of the real size. If they had village work to do, let it be village work, and let it depend to a large extent, as it did before, on the material, and on the tones and values nature would give to it in due course. As a concluding remark he might congratulate Mr. Lever on keeping clear of the morass of amateur architecture.

The Chairman, in putting the vote of thanks to the meeting, said it was to the wealthy layman who understood what architecture really is and could appreciate it as a great art, that we must look for progress in architecture, for however well-trained and however competent architects might be, unless there was a demand for their work, it was impossible to expect that they would produce anything that was satisfactory. They therefore thoroughly appreciated a paper such as they had had from a layman of Mr. Lever's capacity. The secret of the success of Mr. Lever's work at Port Sunlight was, it seemed to him, his early appreciation of architecture. Mr. Lever must be the happiest of men. Talk about the happiness of kings! it was nothing compared to the happiness Mr. Lever ought to feel. Kings were very much created by communities; Mr. Lever had created a community in which all the elements of modern civilisation, in its most representative and free form, had a part. In reference to Mr. Lever's remarks about the girls' homes, it was very interesting to find they were not appreciated; and no doubt the reasons Mr. Lever had mentioned for that were correct. In London, however, such homes were very much sought after, probably because the wages girls received in London were not as high as the wages Mr. Lever paid, and they were insufficient to allow girls to live respectably and happily in London in private lodgings. Moreover, many girls came to London for employment, and they sought these homes because they did not know where else to go. As to the interesting statement in the paper as to the cost of building these cottages, he thought they would all feel, judging from their own experience, that if they built cottages in solid oak half timber, it would be impossible to make a financial success of them; but there were opportunities, especially where the restrictions of the local by-laws were not too stringent, of building something beautiful on the lines of absolute simplicity, of 9 in. brickwork, stucco, and rough cast, and that sort of thing, with tiles and slates, and with no detail. The point touched upon in the discussion as to the influence of trades unions in affecting the price of buildings—an influence which had certainly been one of the causes for the rise in the cost of building mentioned by Mr. Lever—was a matter to be considered. There was no doubt, as was proved recently by the work at Manchester for the Westinghouse Company, that men could be got to lay an average of 1,800 bricks a day instead of the 330 laid by the L.C.C. workmen. He did not say the two classes of work were precisely alike, but in any case the disparity was enormous. Workmen did not see that in limiting the output of their industry they were increasing, amongst other increased costs, the rent of the houses they lived in. Mr. Lever had certainly shown that. The Westinghouse people had shown that, by giving a higher wage than the trade union rate, far more work could be got out of a man—Mr. Lever got it in another way, *i.e.*, by providing social enjoyment, &c., in his villages. In conclusion, the Chairman said he should like to read to students once more one passage from Mr. Lever's paper, *i.e.*, "to raise architecture in relation to the dwellings of the million on to broad, comprehensive lines, so as to rest on the only true basis that architecture can ever occupy—the supplying of the requirements of the age with economy, simplicity, and character." He did not know that they had had a more comprehensive description of what architecture should be than that provided by Mr. Lever.

The vote of thanks having been most heartily agreed to,

Mr. Lever, in reply, said as to the birth and death rate at Port Sunlight, the birth rate was double that of the United Kingdom and the death rate was exactly half, but it must not be forgotten that there were many young people employed in the village. Still, there was this satisfaction to be got from the figures, that though the birth rate was high, the death rate was so low. The high death rate in the United Kingdom was the result of a large infantile mortality. As to the building by-laws, they had to conform to them at Port Sunlight, though he had in one matter defied them. In reference to moving industries into the country, it must be remembered that it was only when works became too cramped for successfully carrying on a business that the opportunity for removal into the country occurred. He doubted whether a young industry, without having had experience elsewhere to prove its strength, could start in the country on a sufficiently large area of land, but from time to time the opportunity occurred for removal on the part of some industries, and he believed that the movement would go on. To carry on an industry in a town was more costly than in the country, provided that in the country there was a railway near the works; and that was apart from the question of rates. As to trades-unions, he paid, and he was quite certain it paid him to pay, the highest trade-union rate of wages in all departments, and the character of the accommodation at Port Sunlight was an addition. The effect was that it produced a better selection of men, who valued their positions and were anxious to keep them. As to what the railway companies would do, he was no believer in British railway companies and their broad-mindedness. One railway—the Lancashire and Yorkshire Co.—had works at Miles Platting. The works became too small, and it was determined to move away. The company attended a land sale (though no one knew the company was represented), and they bought a farm of 200 acres at Horwich at 50*l.* per acre, and they built their works exactly as they had been at Miles Platting. But, worse than that, the company let the land adjoining their works to builders, who built houses on the same crowded plan as at Miles Platting. As railway companies could raise money at 3 per cent., it would have been a fine thing if this company had tried the twelve houses limit that he had referred to. In consequence of what the company had done, many of the workpeople still preferred to live at Miles Platting, going to and from their homes each day, instead of which it ought to have been made possible for them to live at Horwich, which was in a beautiful moorland district. As to the possibility of building houses for tenants to pay at 1s. 6d. per week, he also despaired of doing it, if they were going to be very particular as to the style of architecture of such cottage, and would not have a cottage built that would not stand criticism in the architectural papers. He could not sympathise with those views. One of the greatest uses architects could make of their art was to show that they could build cottages to suit the means of people who had to live in them. Could not architects ignore tradition as to building material, and do for house building what manufacturers had had to do for the manufacture of articles to meet modern requirements? Every article that was used in our daily life had, so far as he knew, been cheapened by modern processes and methods of manufacture, with one exception, *i.e.*, houses. In the matter of building, we were hidebound, and every one was afraid of being criticised and of producing something which, from an art point of view, would be open to criticism; and the result was that houses were the only things which entered into our daily life which had not received the benefit of modern methods of manufacture. He did despair of getting houses to let at 1s. 6d. per week if we were to be tied down in that way, but he did not despair of getting beautiful sanitary houses to let at 4s. per week, and that was the maximum labourers could pay in agricultural districts—probably not as high as that in some districts in the south of England. As to the wages he paid, they ranged from 20s. per week to, say, 50s. In many of the houses there would probably be a son or daughter working in the works as well, so that the income was much more; but they had a rule that no man who received less than 25s. per week could have a cottage the rent of which was over 4s. 3d. per week, including everything; while those earning more than that could have a parlour house the rent of which was 5s. 6d. per week. As to lodgers, that was a difficulty in the building of such villages. At Port Sunlight they had a rule that a tenant who had no family could have two lodgers, and if they had one or two young children they could also have two lodgers; but when the children got to be eight or nine years old, unless there were two only, of the same sex, they were not allowed to keep lodgers at all. The tenants sometimes thought this hard, but the view he took was that though the income might be increased by having lodgers, the children had to pay for it in lessened attention from the wife. As to the question as to the cost of land, his experience about the cost of land at Port Sunlight was as follows. They began by paying 200*l.* per acre, but the last portion was bought at the rate of some thousands per acre, though that was because the owner knew they must have it—a small piece. They paid 500*l.* per acre for a large area. It would be asked: Why had they not taken the whole site at first, when they could have got it at 200*l.* per acre? The answer was that when they bought they thought they had bought ample for all future requirements; but as the village grew they found they wanted more, and so on, and each time they had to pay more. The only remedy for this state of affairs was prudence and forethought. As to the government of the institutions of the village, everything was managed by those who lived in the village. They appointed their representatives on the School Board, and the institutions were managed and supported by the villagers with the one exception of the rent—the buildings were rent free. It was a much better arrangement than if caretakers were put in, for more use was made of the various institutions. The best feature they had at Port Sunlight was the allotment gardens, and it gave men a great pleasure to be able to walk into their gardens for a few minutes before or after work. As to agricultural housing, the village of Thornton Hough was purely agricultural. It seemed to him that in an agricultural district the house should go as part of the equipment of the land. They could not have farms without farm buildings, and they could not have farms in the country without houses for the labourers. The whole thing should be taken together, and the house alone could not be taken to pay. As to what had been said about the Waterbury Watch Co., he might mention the case of another American company, *i.e.*, the National Cash Registry Co., which carried on their work on the same lines. Last year some of the men walked into the office of the manager and told him they wanted the money he was spending on their comfort to be given in wages, and they said they would do for themselves what the company had been doing. The matter was ended now, but it led to a strike which lasted three months. At Port Sunlight, in the early days, very few of the people could understand the matter, and the people were always looking round to see where they were being had, as they thought; but as time went on the suspicion disappeared. In any movement of this kind one must be prepared for such suspicions at first, for there was a tendency in people to think they would be made to pay dearly later on for something one might do for them.

The Chairman announced that the next meeting would be held on April 11, when Mr. W. D. Caröe would read a paper on "The Preservation of Ancient Buildings." On the same day, at 7 p.m., a special meeting will be held to consider some alterations and additions to the by-laws.

The meeting then terminated.

BOOKS RECEIVED.

THE GEORGIAN PERIOD. Measured Drawings of Colonial Work. Part IX. (*American Architect.*)

THE GOVAN SARCOPHAGUS: THE SHRINE OF ST. CONSTANTINE. By P. Macgregor Chalmers, F.S.A., Scot. (Carter & Platt, Glasgow.)

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THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

IV.—THE ROMAN CATHOLIC CATHEDRAL, WESTMINSTER; AND POLICE STATION, NEW SCOTLAND-YARD

THE fourth spring visit of the session was made on the 22nd inst. to the new cathedral in Ashley-gardens, Westminster, when, in spite of the weather, a large number of members met to inspect the late Mr. Bentley's wonderful building. Mr. Lamb, the assistant clerk of works, met the party, and, after a brief inspection of the drawings in the office, members wandered more or less at will over the entire buildi .g

The cathedral has been described and illustrated in these columns, so that it is, perhaps, best to give a somewhat impressionist description rather than a detailed account. Criticism is almost beside the mark; and, moreover, the thought was ever present that the force and brain which have called the building into being are no longer; and therefore, no matter what arrangements Mr. Bentley may have made for the completion of his work, the master guiding hand has gone, and the ultimate result may in some ways be other than he would have had it. Mr. Bentley was such an absolute master of detail that his loss is probably far more than appears at first sight, and though the building is in a measure completed and some scheme of internal decoration actually settled, it cannot but lose by his untimely death.

This being granted, it is, perhaps, allowable to take the building as we found it on this occasion, and to attempt in some small measure to record its effect upon the mind rather than to describe in detail its great architectural features.

The exterior is practically complete, with the exception that some 30 ft. of the campanile still remains to be finished. Speaking still from the impressionist point of view, one must confess to a slight feeling of disappointment in the exterior taken as a mass. It does not seem to have that compelling power of arresting the attention which takes hold of you directly you pass in by the great north door. There, you are brought up instantly. The great gaunt brick piers and arches, with the broad wealth of soffit, the flat saucer domes with the suggestion of atmosphere already hanging to them, the vast scale and mass, produce at once that effect no doubt intended, the feeling almost of being crushed beneath the all powerful influences of the great Church. Outside, this effect does not seem to be produced, and though, wherever you turn, you find ample evidence of the architect's care and thought in the beauty of the detail, arrangement of masses, texture of the materials, and in the play of light and shade, there would seem to be a something missing of the stupendous impression produced by the interior. The north entrance façade has had to be designed in receding planes on account of ancient lights opposite, and this perhaps somewhat detracts from the effect which might have been produced had it risen up sheer in one mighty front.

It was, too, with rather a shock that we learnt that the campanile, which will be some 284 ft. in height, is almost entirely built for effect. It will only have one bell, and the rooms in it will probably not be required for any useful purpose.

The present bald frankness of the interior with its scale forced upon the observer by the plain brickwork, and the fine contrast of the small balconies high up in the nave walls, will give place to a casing of marble up to a height of 37 ft., and mosaic above to walls and domes as funds permit. Thus the entire character of the interior will change.

In place of the grand massiveness and strength now so apparent, will come richness and colour and a greater feeling of mystery, perhaps, but also probably some loss of force, some loss of that feeling of personal littleness so marked in the building as it stands to-day in its naked and incomplete outlines.

One of the western side chapels is now being decorated in marble and mosaic, and this, we understand, entirely from Mr. Bentley's own designs. The beauty of the detail and selection of colours is as one would expect from such a master. It was understood that Mr. Bentley was not intended by the authorities to design all the decoration, though we believe he has to a certain extent been consulted; but if he was not absolute arbiter, it would seem there must be some estrangement between the completed building and the conception of its designer. In conclusion, it can only be said that there was but one feeling among the members, a feeling of regret and sorrow that the architect had not lived to see the completion of the greatest work of his life, and Tennyson's oft-quoted words must have been present in many minds.

After leaving the cathedral, a visit was paid to the new police-station in Cannon-row, New Scotland-yard. Mr. Dixon Butler, the architect, was unfortunately prevented by illness from showing the members over the building himself, but Mr. Howell and the clerk of works were most kind in explaining everything. The new offices on the ground floor consist of the usual police-station, parade-room, charge-room, cells, &c., and also stables, while above are quarters for ninety-six single men, four married men, and a chief inspector and sub-inspector.

The men's dormitories are divided into light and airy cubicles, and they have a kitchen, dayroom, billiard-room, and library, with bath-rooms, lavatories, &c. In the basement are drying and brushing rooms for the men's clothes, stores, &c. Space does not permit of a lengthy description, but the building proved full of points of practical interest, and one could not fail to be struck with the remark that the men themselves are found to respond to the care taken in providing healthy and cheerful quarters by a better state of efficiency. The materials employed are similar to those used in Mr. Norman Shaw's building opposite, granite for the lower stories, and red brick above.

It should be mentioned that the new building is intended for the A Division of Police, and forms one other example of the minute care and attention to practical, as well as æsthetic, points which is so necessary nowadays from the architect if his building is to reach the high standard required by modern ideas and aspirations.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the meeting on Wednesday, the 19th inst., the Chairman, Dr. W. de Gray Birch, exhibited and gave some particulars of an interesting relic of the celebrated Admiral Sir G. B. Rodney. The relic consisted of a cocoanut shell, mounted in silver and with silver foot, which, according to the Hall-mark, is dated 1781, whereas the cup itself, most elaborately carved with representations of ships of war, fortresses, &c., is dated 1782, and apparently commemorates the defeat of the French and Spanish fleets near Martinique, when Rodney in the *Formidable* broke through the French line, engaged the *Ville de Paris*, the Comte de Grasse's flagship, and compelled her to strike on April 13, 1782. It is probable that the cup was at first only the plain shell, but mounted in silver as described, and that it was carved afterwards by some officer or sailor who had taken part in the action mentioned, and so dated 1782. In the discussion which followed, Mr. Gould, Mr. Compton, Mr. Rayson, and Major Frere took part, the latter remarking that he possessed some war medals referring to that particular campaign.

SUSSEX ARCHÆOLOGICAL SOCIETY.—The annual general meeting of the Sussex Archæological Society was held on the 19th inst in the lecture hall of the Lewes Town Hall, the Rev. Canon Cooper presiding. In moving the adoption of the report, the chairman expressed regret at the absence of the secretary, Mr. Michell Whitley, and then alluded to the recent excavations at Lewes Priory, which, he said, had been undertaken with the most earnest industry. The expense of the work had been very considerable, and the Society's funds were not quite equal to it. There had been a great point in their history that year in the opening of the exhibition of Sussex iron in Lewes Castle, and for which they owed their thanks to Mr. Dawson.—Canon Cooper said he had a letter from Mr. Dawson, in which that gentleman suggested that the Society should hold an exhibition illustrative of the ancient staple industries of Sussex. He suggested that the exhibition be held (with the permission of the Hon. Curator) in the lower room of the Barbican Gate-House, Lewes Castle, where there are already some valuable specimens of Sussex pottery.—The report and balance-sheet having been adopted, and the officers having been elected, the first paper was read by Mr. W. H. St. John Hope on "The Recent Excavations at Lewes Priory." Through the exertions of Mr. Michell Whitley and the courtesy of Mr. Blaker, who owned the site, and of Mr. Courthorpe, who was the lessee, it had been possible, said Mr. Hope, to take up the excavations where they were left off. The excavations brought to light the foundations of a very remarkable structure indeed, viz., the infirmary of the Priory. From the remains of the building, it would appear that it was of the Norman period, belonging to the main building of the Priory, and dating from about the first quarter of the twelfth century. It was remarkable for the massive nature of the whole place. So far as his experience went, they had not the like in this country; and so far as foreign monasteries were concerned, he did not remember seeing anything like it abroad. There were extraordinary evidences of its destruction. The method which had been employed in demolishing it had been to support the walls with posts, then dig trenches, and afterwards burn the posts, which gave way under the walls. The walls had been overthrown at all angles. He had no doubt in his mind that the building was the first infirmary of the Priory. The purpose of the ancient infirmary did not quite correspond with those of our modern buildings of that name. The monastic idea was that sick brethren should go there, but it was also a place for the infirm brethren; also for those recovering from the process of bleeding—a remedy so generally resorted to in ancient times. The building was about 100 ft. long, and the nave was 26 ft. wide. There was an upper story to the nave. Investigations showed that there had been very considerable extensions to the infirmary, consisting of a great hall about 113 ft. long and 50 ft. wide, divided by pillars and arches; also that there had been two small buildings, apparently the buttery, pantry, and kitchen. These extensions had evidently taken place about the middle of the twelfth century. One of the marked differences between this second infirmary and the first one was that no such violence had been employed in the demolition of the second as had been employed in the case of the first, but that of the second there was no architectural fragments whatever.—The next paper was on "Trotton Church and its Brasses," read by Mr. P. M. Johnston. Mr. Johnston explained that Trotton was one of the most remote of Sussex villages, being on the Hampshire borders, and having a population of 250. The church now standing was probably erected by Mary de Camoys, the elder, who died in 1310, and whose brass was in the floor of the nave. Another brass, which was hardly inferior in interest, was that describing Baron de Camoys and his wife Elizabeth, widow of Harry Hotspur, mentioned by Shakespeare as "Gentle Kate," and her son.—Mr. Garraway Rice gave some notes relating to iron foundries and ironwork from Sussex wills proved in the Prerogative Court of Canterbury from 1383 to 1558 and from 1649 to 1701. The information gleaned related to personal history, buildings, furniture, wearing apparel, jewellery, tombs, ecclesiastical vestments, &c. An extract, dated 1504, related to a ton of iron of the value of 66s. 8d.—The last paper was on "Ancient Cultivation," and was read by Mr. Reginald Blaker.—*Sussex Weekly News.*

THE STRAND IMPROVEMENT.—Mr. R. Clutton sat as arbitrator at the Surveyors' Institution on Monday last week upon a claim by Messrs. Mitchell & Co., sanitary engineers, against the London County Council for 34,500*l.* compensation for the demolition of their premises in Drury-lane, Wych-street, and Denham-yard, acquired by the Council for the Strand to Holborn Improvement scheme. Mr. Balfour Browne, K.C., and Mr. Morton appeared for the claimants; and Sir E. Clarke, K.C., and Mr. Boyle, K.C., represented the Council. Expert evidence was given, and Sir E. Clarke stated that they had settled the amount for fixtures, fixed plant, and removal of loose plant for 1,000*l.* The arbitrator reserved his award.

PODMORE'S WINDOW-FASTENER.—A specimen of this window-fastener has been sent to us by Messrs. Colledge & Bridgen (Wolverhampton). It is a simple and good one. A short, strong brass arm is pivoted on the rail of the outer sash, and carries through its end a screw which screws down into a countersunk hole in the brass fitting of the rail of inner sash; the hole having a conical section, the screw working into it draws the sashes together. There is no dependence on springs, and nothing to get out of order.

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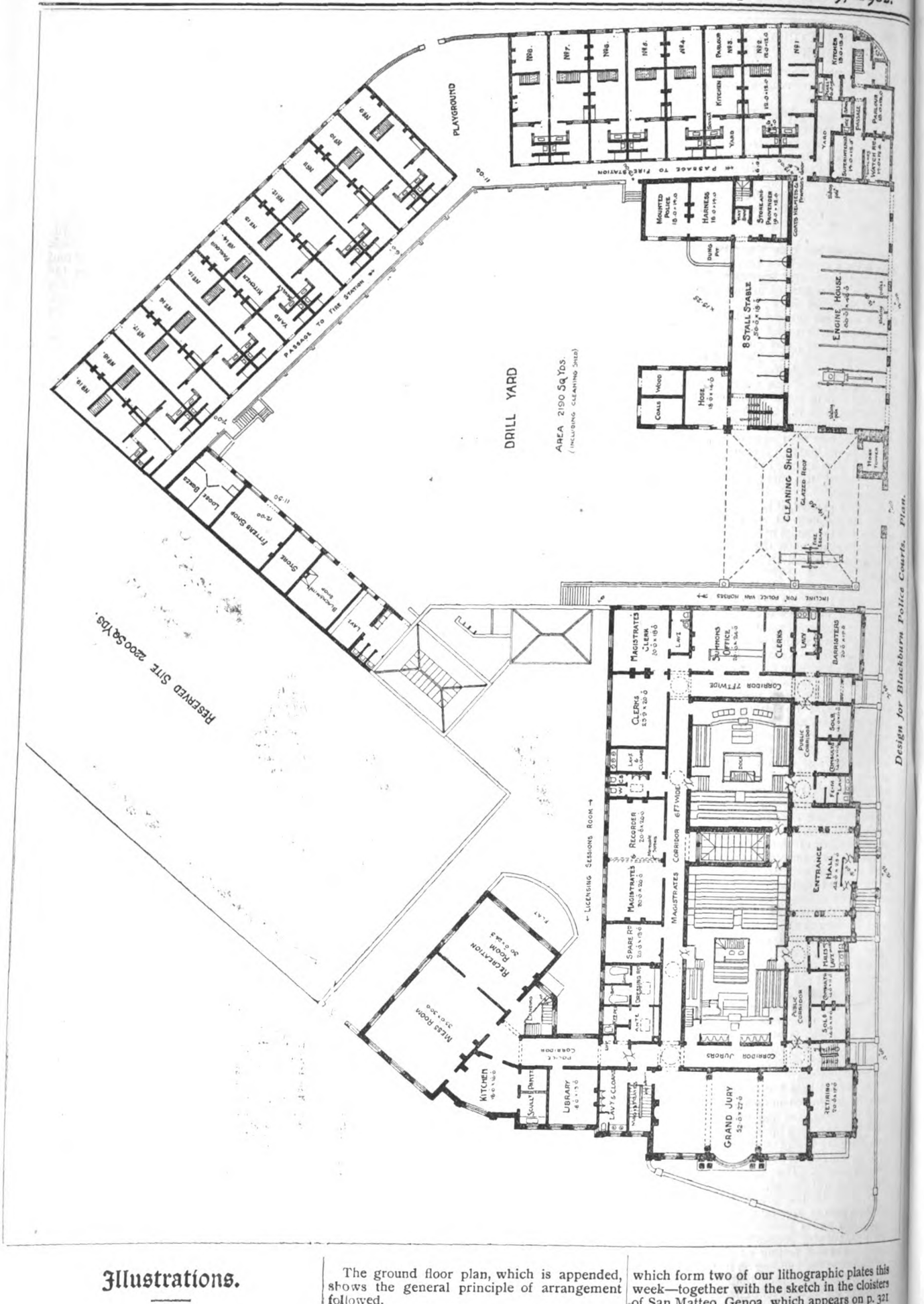

Illustrations.

BLACKBURN POLICE COURTS: COMPETITION DESIGN.

THIS fine design, by Messrs. Woodhouse & Willoughby, of Manchester, was one of the six submitted in the final competition for the proposed new Police Courts at Blackburn.

The ground floor plan, which is appended, shows the general principle of arrangement followed.

The perspective view was exhibited at the Royal Academy last year.

SKETCHES OF ITALIAN WORK.

THE two sketches of part of the library at St. Mark's, and of a staircase in a palace at Genoa, which form two of our lithographic plates this week—together with the sketch in the cloisters of San Matteo, Genoa, which appears on p. 321—are from a number of sketches in Italy made by Mr. Herbert Raine.

Sansovino's building at Venice is too well known to need comment, but the sketch shows it from a point of view which is not often taken. Most of the published illustrations show the building from a front view. By taking a portion of it in rather sharp perspective, Mr.

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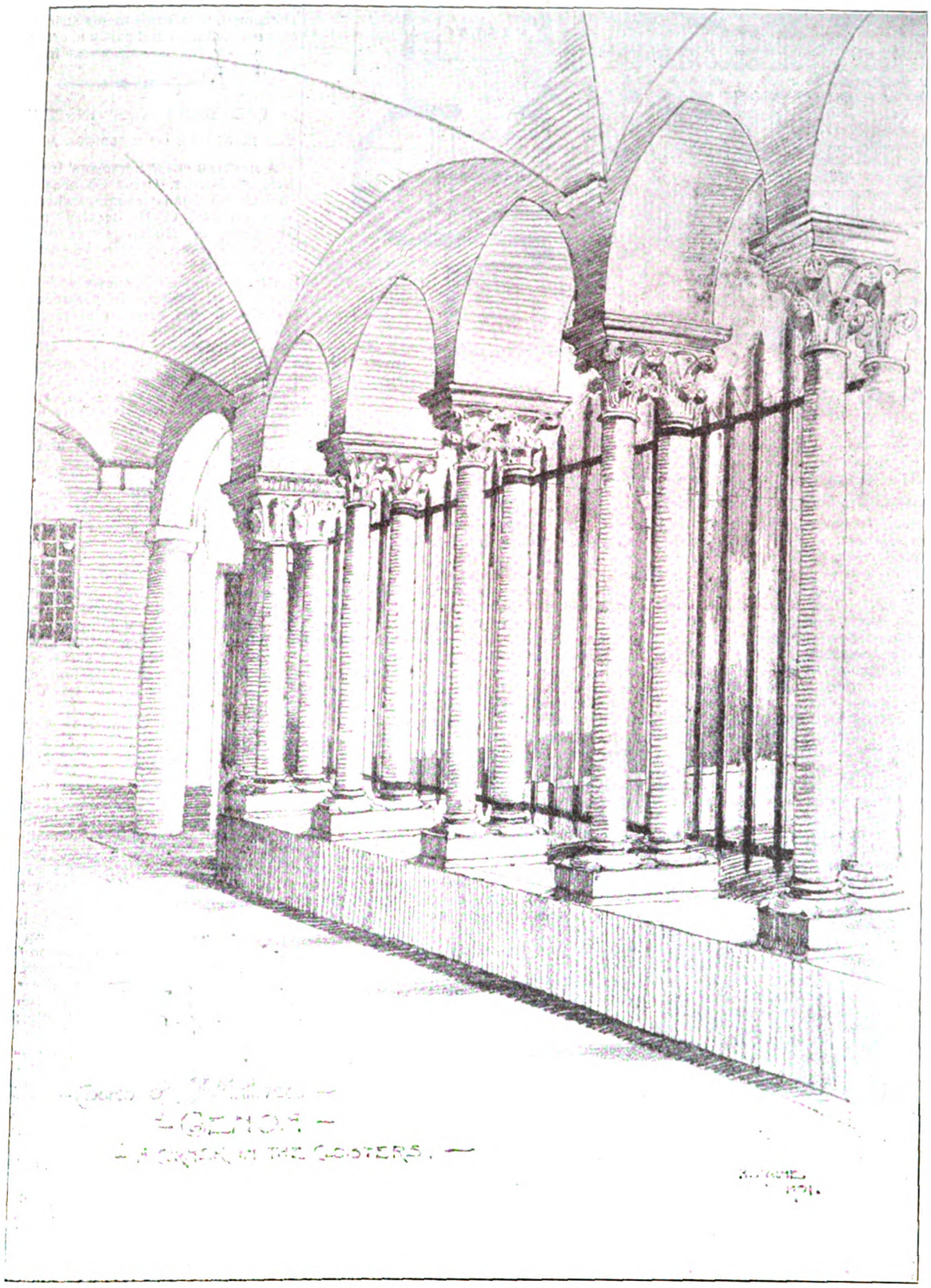

Raine has been enabled to convey a good idea of the amount of relief of the sculpture in the spandrels, and the sketch in general is a very good and effective one.

In regard to the other two sketches Mr. Raine writes :—

"The name of the palace at Genoa in which this staircase occurs I was unable to find out, but it is a very good example of a distinctly Genoese type. The stair runs across the end of an entrance hall 36 ft. long by 25 ft. wide. The first three steps are about 12 ft. wide, but the general width of staircase is only 8 ft. The risers are 7¼ in.

The Cloisters of the Church of San Matteo, Genoa, are certainly the most interesting part of the church. Their date is 1310. The shafts of the columns are of a dark-coloured marble, while the whole of the vaulting is whitewashed. The height from floor to apex of arches is only 10 ft. 6 in., and the space between each double column is only 4 ft., so it will be seen that its scale is small, which rather enhances its beauty. The walls are adorned with many beautiful tablets to the memory of great Genoese families."

ST. PETER'S CHURCH, CRICKLEWOOD.

This church is built with Bargate (Surrey) stone, the quoins hammer dressed with square stone in stretching courses at intervals bedded on three courses of red plain tiles flush with the face of the walling, which is built in random work. Bath stone from the Monk's Park quarry was used for the wrought stonework. The roofs are covered with Broseley tiles. Internally, Corsham Down stone was used for the arcades, and dressed stonework, and the walls are lined with red heather bricks and malms. The timbering of the roofs is left as from the saw.

Messrs. Goddard & Sons, of Farnham, were the builders. The architect is Mr. Thomas Henry Watson.

The drawing was hung in last year's Academy.

CHURCHYARD CROSS, LEASINGHAM.

This exceedingly pleasing design for a churchyard cross, by Mr. A. H. Skipworth, is reproduced from a pencil drawing exhibited at last year's Academy.

Though the design has something of the character and feeling of mediæval work, yet it will be seen that it is no mere reproduction of mediæval detail, as is so often the case with modern work of this kind ; it is the spirit of mediæval work, with a modern treatment.

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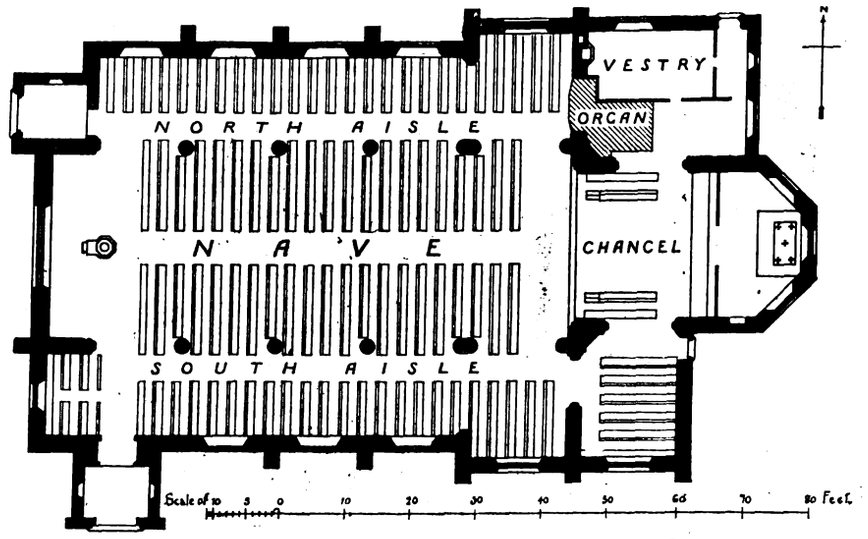

St. Peter's Church, Cricklewood. Plan. [*See preceding page.*

CARPENTERS' HALL LECTURES:

EARLY RENAISSANCE BUILDINGS IN ENGLAND.

THE concluding lecture of the series of six given at the Carpenters' Hall, E.C., during February and March, was delivered on Thursday evening in last week by Mr. J. Alfred Gotch, F.S.A., on "Early Renaissance Buildings in England." The lecturer said that architecture, in common with all other things which came under the observation of mankind, showed a tendency to change. No sooner had a set of forms become established and been carried towards perfection than they were supplanted by another set, which in their turn lingered long enough to imprint their character on the period, and then gave way to yet others. In England this process of evolution continued uninterrupted during the fourth and fifth centuries—from the time when they might first be said to have possessed a national architecture—down to the end of the fifteenth century. Each successive fashion was suggested by something which went before, but at the beginning of the sixteenth century, when Henry VIII. came to the throne, the conditions underwent an alteration and certain forms and features crept in which had their origin, not in the severe grey climate of England, but in the luxurious and sunny air of Italy. In other words English architecture felt the touch of the Renaissance, and it was the earliest effects of this new influence to which he desired to draw their attention and to show how these foreign forms were at first received. They knew in course of time they established themselves further, but in the beginning their foothold was somewhat precarious; they effected a lodgment here and there, but not over the whole country; in this feature and in that feature, but not over the whole structure. The struggle went on during the whole of the sixteenth century and into the seventeenth century, until at length, under the leadership of Inigo Jones, the invaders finally triumphed. It might be asked what was the Renaissance in relation to English architecture, and to answer that question a few elementary facts had to be stated. In Europe there had been two main styles of architecture — the Classic and the Gothic; Greece and Italy being the home of the former, and the western countries of Europe the home of the latter. Classic architecture was, of course, the earliest, and dissimilar as the two were, Gothic was in a manner derived from it. The fact of chief importance was that by the end of the fifteenth century all conscious connexion had long ceased, and the workers on Gothic architecture had no notion that there was any other way than their own of dealing with a building and of embellishing it with ornamentation. The Gothic style had become quite independent of the Classic, and was, in many respects, its antithesis. The influence of the Renaissance had dominated Italian work long before it found its way across the sea to England, and it was Henry VIII. who first introduced it when he caused the splendid tomb of Henry VII. in Westminster Abbey to be built. Torrigiano was employed by Henry VIII. on the tomb, and he was followed by a few more Italians. There was, however, a good deal of Italian-looking work done in England which was attributed to foreigners, but which was undoubtedly done by English craftsmen. Henry VII. chapel in Westminster Abbey was entirely Gothic in its character, but in the tomb was to be found the first appearance of the Italian spirit in England. Mr. Gotch proceeded to give on the screen illustrations of Classic and Gothic architecture, and afterwards showed a number of tombs, sections of buildings, &c., designed and executed between 1500 and 1550, his object being to illustrate how, although the general conception of the building was Gothic, yet here and there traces of the Italian spirit crept in, which as years went on got more and more developed. In the tomb of Henry VII., for instance, the base was ornamented in thoroughly Italian fashion, and there were pilasters with vases and foliage which marked Italian work; the two Cupids were obviously Italian, and the patron saints in the panels were live figures. It was not at all improbable, however, that English assistance was obtained for the heraldry. In the tomb of Thomas Lane, in Stamford Church; the tomb of Sir G. Verney, in Bakewell Church; the Salisbury Chantry of Christchurch, Hants (dated 1529); in the choir seats of Christchurch; and in the tomb of Lord St. John in Basing Church were to be found traces of Italian style, although the general lines were Gothic, and it was probably true that in all the execution was by English workmen. There was distinct evidence of this in the panelling at Magdalene College, Oxford, dated 1541, for the names of the workmen were preserved, and they knew that Henry Bolton and one Frost were the two principal joiners employed, and did the whole of the carving. Bolton did some of his badly, for it is recorded that Frost "spent 5 days in cleaning and putting the last touches on the cresting which Henry Bolton had unskilfully and coarsely panelled and carved." It is also recorded that Bolton was paid 8d. a day and Frost 7d. On the chimney piece of Deene Hall, Northamptonshire, and the panelling of Haddon Hall (dated 1545) there were traces of Italian work, although the general treatment was Gothic. The screen of King's College, Cambridge, was, however, one of the finest examples of Italian work to be found not only in England but on the Continent. The date was 1532-6, and the exquisite modelling and execution pointed to Italian workmen. Proceeding to deal with houses, Mr. Gotch pointed out several specimens of Italian work in Hampton Court Palace erected 1514-15, particularly the ceiling in Wolsey's closet. At Layer Marney, Essex, which appeared at first sight thoroughly Gothic, there were some curious mixtures of Italian and Gothic work in the towers. At Sutton Place, Guildford (1523-25), right in the Gothic moulding was some Italian decoration, and at Laycock Abbey, Wilts, the seat of Sir Wm. Sherrington in 1540, there were some tiles with distinct evidence of Italian work. In conclusion, the lecturer said the examples he had given showed how fitful the new fashion was in its appearance, and the other point which they tended to bring out was that in spite of the Italian character of the detail, much of the work was executed by English craftsmen, who must have caught the foreign trick from Italians or Frenchmen, or sometimes Dutchmen, who came to our shores partly by express invitation and partly in order to escape the tyranny of circumstances in their own native lands.

THE SURVEYORS' INSTITUTION:

THE INSURANCE OF BUILDINGS AGAINST FIRE.

A MEETING of the Surveyors' Institution was held at No. 12. Great George-street, Westminster, on Monday evening, when the discussion on Mr. C. H. Bedell's paper, "The Insurance of Buildings against Fire," was resumed. Mr. A. Vernon, Vice-President, was in the chair.

Mr. J. Douglass Mathews said there was a very large increase in hazardous insurance owing to the erection in recent years of so many warehouses and factories. The smaller buildings, more especially, were now built of exceedingly light material, and if a fire occurred in one of them it was almost impossible to stop it. Then in large buildings a very great enemy to fire insurance, but great friend to commerce, was the use of steel and iron, and also large window openings with their corresponding amount of glass. These were very serious things to contend with, and it was not wonderful that insurance offices looked seriously upon buildings constructed in that way. Iron and steel, however, had come to stay, and the difficulty must be faced. Another element of risk was the fact that whereas in former towns there was a yard attaching to large buildings, and therefore isolation, now, in cities and towns, buildings backed upon one another. He contended that it was the duty of the companies to send surveyors to inspect all buildings offered for insurance, in order to see that the description given was correct. They could also say what contingencies might arise in connexion with adjoining buildings in reinstatement after a fire. This would not only be an advantage to the companies, but to the insured as well, because an expert, when looking over their premises, would be able to call attention to many defects. As an expert, he would be able to point out a weakness which might be easily overcome, and would result in a great reduction in the rate of insurance. He would go further, and say that the companies should have a fresh survey made every five years, not only because buildings might be altered, but because building requirements might vary, especially since the passing of the London Building Act, 1894. The attention of the insurer would also be called to the impossibility of restoring the building as it was originally constructed. It was also very desirable that before a building was erected the plans should be submitted to the surveyor of an insurance company to see what suggestions he had to make. Formerly it was absolutely impossible to get a reduced rate of insurance. Things, he was glad to say, were now somewhat altered, but there was still great difficulty, notwithstanding the desire to make buildings as far as possible fire resisting, to get a proportionate reduction in the rate. The public should know that the surveyors to the insurance companies were prepared to make suggestions that might be advantageous in this respect. There were many ways in which the possibility of the spread of fire might be reduced by the use of fire resisting material. This was a very important matter, because, now that fire stations were near and hydrants many, a fire could be stopped in a very short time and great expense saved. In the reconstruction of the buildings after the Jewry-street fire a great deal was done to reduce the risk of the spread of a conflagration in the future. The buildings were not all fire resisting, but a great many of them were very nearly, and others were constructed in a way which would prevent the spread of fire to the extent which had occurred. Unfortunately, however, the holders of the property had to pay an extra high premium because of the hazardous area. With reference to the builder's plant and material he must insure himself and take it into account in his own contract, and generally speaking the insurance companies should only be asked to restore premises in the same condition as they found them at the time of the fire.

Mr. Wheeler, K.C., dealt with the question of settlement of claims. He contended that it was time the conditions of policies should be

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reconsidered and recast, and said that, in his judgment, the insurance offices would do well to adopt arbitration such as was set forth in the Arbitration Act.

Mr. Lovegrove said that the amount of the policies should be reviewed from time to time, owing to the increased cost of building material and labour. In many instances the amounts fixed by surveyors to estates were often far short of the actual value of the property.

Mr. Woodward said that, generally speaking, the insurance companies should pay the full amount of the policies. He agreed that fresh conditions should be discussed.

Mr. H. Chatfeild Clarke said that where an owner was prepared to bring his building up to the very best requirements, covering all steel and iron with plaster, &c., and using fire-resisting materials, a much greater reduction in the premiums should be made. They must all agree that when buildings were constructed in this way the probability of a serious fire was very greatly minimised. They did not now think of putting up matchlining, canvas, and plaster partitions, with a hollow place inside in which gas and flames could accumulate, and be extremely difficult to get at. In days when owners were prepared to go the whole distance to protect their buildings from fire the risks were greatly reduced. Agents of insurance companies were always ready to inspect plans of proposed buildings, and give valuable aid by their suggestions. He considered that the companies should have more surveyors on their staff to inspect the risks which they took.

Mr. Shirley said, in his opinion, also, the conditions of policies should be very much amended, if not done away with entirely.

Mr. Howard argued that in the case of cottages and farm buildings in the country where the value had gone down and the cost of building increased, the insurance companies could not be expected to reinstate the property exactly as before.

The Chairman said the discussion disclosed the fact that there were many surprises in the relations between the insured and insurer. Nine-tenths of the persons who had insured were not fully protected against loss. He thought that faults were on both sides. The present position was very unsatisfactory, and the rates of insurance were intolerantly and grotesquely unequal. The present condition of things did not give to the insurer what he clearly expected and was entitled to expect, namely, full indemnity to the amount of the face value of the policy.

Mr. Bedells, in replying to the discussion, said that in regard to the insurance of buildings in course of erection, the policy taken out by the contractor in the joint names of the builder and owner should not include builder's plant and unfixed material, because one of the fundamental principles of fire insurance was that where two persons were jointly concerned in a policy, it must cover nothing but property in which both persons were interested. The reason was apparent in the case of a dispute, and the builder being found to have acted dishonestly, the owner's insurance was lost as well as the builder's. He strongly favoured the periodical revisions of policies and surveys of the property.

A vote of thanks to the chairman concluded the proceedings.

COMPETITIONS.

MUNICIPAL BUILDINGS, SOUTH SHIELDS.—A special meeting of the South Shields Town Council was held recently for the purpose of considering a report from the Municipal Buildings Special Committee in regard to further plans which have been prepared by the six architects selected to compete. The original designs were based upon a limited cost of 25,000*l.* which sum was subsequently considered inadequate for a pile of buildings in Ogle-terrace. It was, therefore, decided to ask the six competitors to send in new designs based upon an expenditure of 35,000*l.* The committee report that these designs were submitted to the adjudication of Mr. Belcher on February 19, and his report was read on the 5th inst. He states that the six sets of revised designs have all been carefully worked out in compliance with the conditions, and fully justify the selection made for the second competition. He had no hesitation in placing first the design marked No. 2. It was an admirably-arranged plan, and the several departments were conveniently placed. The cost of this design, taken throughout at 1s. 2d. per foot, has been placed by the author at 35,000*l.*, but on the cubic capacity furnished by the Borough Surveyor, it amounts actually to 31,875*l.* net, this cost being considerably less than any of the other five works, none of which could be executed for the sum stipulated. The committee decided to adopt Mr. Belcher's selection, and the envelope containing the name of the author of design No. 2 was opened, the architect being Mr. Ernest E. Fetch, A.R.I.B.A., London. Mr. Fetch won the award in the first competition.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—On the 15th inst. this Institution held its annual conversazione at the Westminster Palace Hotel, the guests being received by the President, Sir John Jackson and Lady Jackson, and by the Chairman, Mr. Percival Marshall and Mrs. Marshall. Prominent in the exhibition of models, &c., were some fine examples of the work of members of the Society of Model Engineers; a steam and an electric track were erected and model locomotives run upon them. Amongst other features of interest were the Stroh violin shown by its inventor, Mr. Charles Stroh, and the Pianotist; and in the lantern-room a lecturette, entitled "Engineering in Miniature," was given by the Chairman. Sir Charles Hartley, Mr. J. T. Wood, Messrs. Thornycroft, Messrs. Yarrow, the Great Eastern Railway Co., Mr. G. Cussons, Mr. J. B. Thorp, the Power Gas Corporation, Messrs. David Joy & Son, the Parsons Marine Turbine Co., Messrs. Lobnitz & Co., Professor Dalby, the Empire Roller Bearing Co. and the Hulburd Engineering Co. were amongst those who contributed to the exhibition of models, &c.—On the 22nd inst. a visit was paid by the members to the Victoria and Albert Museum, South Kensington, to inspect the collection of naval, mechanical, and scientific models, &c. Mr. W. J. Last conducted the party round, and pointed out the features of special interest. To some old Maudslay's men the sight of the beautiful models which used to be on view in the board room at Lambeth proved particularly attractive, and gratification was expressed that they were thus preserved as a complete collection. Mr. Last showed the members the workshop for the making and repair of models and plant for compressed air by means of which, at a pressure of 5 lbs. to the square inch, some of the models are actuated.

BRITISH ASSOCIATION OF WATERWORKS ENGINEERS.—The seventh annual general meeting of this Association will be held at Leicester on July 22, 23, 24, and 25 under the presidency of Mr. Frederick Griffith, M. Inst. C.E., Corporation Water Engineer.

ARCHITECTS' BENEVOLENT SOCIETY.

A GENERAL meeting of members of this Society was held in the rooms of the Royal Institute of British Architects, No. 9, Conduit-street, W., on Monday, to confirm the alteration in the by-laws adopted at the annual general meeting held on March 12.

The Resolutions, as follows, were confirmed:—

1. That By-law No. 55 shall be amended to read as follows: "All legacies and all donations shall (unless otherwise directed by the donors) be laid out or invested under the direction of the Council, in or upon government or other securities or investments in which a trustee may invest under the powers of the Trustee Act, 1893, or under any subsequent Act or Acts for the amendment of the same, or in or upon any security or investment for the time being permitted by the Chancery Division of the High Court of Justice, or any authority constituted in lieu thereof."

2. That the first word in By-law No. 65 shall be altered from "six" to "ten."

3. That in By-law No. 41 the words "in the second week" shall be substituted for "on the second Wednesday."

HOME ARTS AND INDUSTRIES ASSOCIATION.—The eighteenth annual exhibition of work done in the classes of the Home Arts and Industries Association will be held from May 29 to June 2 in the Gallery of the Royal Albert Hall. The exhibition will include specimens of homespuns and linens, modelling in terra-cotta, metal repousse, woodcarving, inlay, stencils, lace, knitting, baskets, rugs, and toys, and of other arts and industries.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday at the County Hall, Spring-gardens, the Chairman, Mr. M'Dougall, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council 11,325*l.* for paving works; Hammersmith Borough Council, 7,295*l.* for electric light installation; Poplar Borough Council, 2,280*l.* for paving works; Islington Borough Council, 4,873*l.* for electric light installation; Westminster City Council, 26,400*l.* for alterations to town-hall; and Camberwell Board of Guardians, 78,110*l.* for extension of infirmary.

Housing Schemes.—The Housing of the Working Classes Committee recommended:—

"(*a*) That the estimate of 56,151*l.* submitted by the Finance Committee in respect of the erection of dwellings on the Preston's-road and Norfolk-street sites, Poplar, be approved.

(*b*) That so much of the Preston's-road site as is required for the accommodation of the 269 persons to be displaced by the carrying into effect of the Burford's-court, &c., scheme be appropriated for the purposes of Part I. of the Housing of the Working Classes Act, 1890, under Section 23 of the Act.

(*c*) That, subject to the consent of the Local Government Board, the remainder of the Preston's-road site and the Norfolk-street site be appropriated for the purposes of Part III. of the Housing of the Working Classes Act, 1890, under Section 57 (3) of the Act. . . .

(*d*) That the offer of the School Board for London to pay to the Council a sum of 10,359*l.*, subject to the Council taking over the Board's obligations under the Education Board Provisional Order (London) Act, 1899, for the rehousing of 1,030 persons of the working class, and subject to the Council indemnifying the Board against any future liability which may arise in respect of its obligations under the said Act as to rehousing the said number of persons, be accepted. . . ."

The total accommodation to be provided on the Preston's-road site as proposed will consist of five-story balcony dwellings containing 250 tenements of two and three rooms. On the Norfolk-street site it is proposed to build fourteen cottages, each of three rooms.

After considerable discussion the recommendations were carried.

The same committee recommended, and it was agreed, after discussion—

"That the estimate of 30,000*l.* submitted by the Finance Committee in respect of the acquisition of land at Old Oak Common-lane, Hammersmith, be approved; that about 50 acres of land at Old Oak Common-lane be purchased from the Ecclesiastical Commissioners under Part III. of the Housing of the Working Classes Act, 1890, at a price of 550*l.* per acre. . . ."

Southampton-row Widening.—The Improvements Committee recommended that the estimate of 165,500*l.* be approved for the acquisition of the freehold and other interests in the properties on the west side of Southampton-row, between Vernon-place and Bloomsbury-place, with a view to the widening of Southampton-row at the part in question to 70 ft. The Committee reported as follows:—

"The present width of the portion of Southampton-row in question varies from 41 ft. to 46 ft. 5 in. The part of Southampton-row between Bloomsbury-place and Russell-square varies in width from 54 ft. to 68 ft., and no portion of the thoroughfare northwards as far as St. Pancras Church is less than 45 ft. 6 in. wide. We are strongly of opinion that a width of at least 70 ft. is necessary for the portion of Southampton-row in question. The thoroughfare extends northwards by way of Russell-square, Woburn-place, Upper Woburn-place, Seymour-street, and Eversholt-street to Hampstead-road at the Cobden statue, and accommodates a considerable amount of general through traffic. It will be noticed that the width of Southampton-row south of Theobalds-road is to be 80 ft. This portion of Southampton-row carries a great deal of traffic going to and from Theobalds-road, and therefore needs a greater width than the portion of Southampton-row to the north of Theobalds-road. Southampton-row, besides accommodating general through traffic from the north of London, forms the principal outlet for the traffic southwards from Euston, St. Pancras, and King's Cross railway stations. The traffic along the thoroughfare has considerably increased since the removal by the Council of the gates and bars in Woburn-place and elsewhere. There can be no doubt that, upon the completion of the Holborn to Strand improvement, there will be a great increase in the traffic in Southampton-row. The lessees of some of the property affected by the proposed improvement are endeavouring to make arrangements for re-building, and it is to be expected that the approaching com-

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pletion of the Holborn to Strand improvement will stimulate the lessees to surrender their present leases, which in some cases have not many years to run, and to obtain grants of new leases in order that substantial business premises may be available in Southampton-row by the time the Holborn to Strand improvement is finished. It is to avoid this development of the property that we are submitting our present proposal to the Council, and it is hardly necessary to state that, if new buildings were allowed to be erected, the cost of ultimately carrying out the improvement would be greatly increased."

The Committee also recommended that the estimate of 2,500*l.* be approved for the acquisition of the strips of land required for widening Southampton-row to 70 ft., at Nos. 67, 69, and 71, and at Nos. 83, 85, and 87.

Both recommendations were carried after discussion.

Strand Widening. — The same Committee recommended that a contribution be made of five-sixths of the net cost of the widening of the Strand to 80 ft. at Nos. 91, 92, and 93 proposed to be undertaken by the Council of the City of Westminster, such contribution not to exceed 20,000*l.* The Committee reported as follows:—If the improvement now suggested be undertaken, together with those already sanctioned by the Council, a continuous width of 80 ft. will be secured for the Strand for a length of about 480 ft., namely, from No. 75 to No. 105, Strand—that is from a point a little to the east of Adam-street, almost as far as Terry's Theatre.

The recommendation was agreed to.

Fire Station, Clapham.—It was agreed, on the recommendation of the Fire Brigade Committee, to erect a new fire station at Clapham, at a cost of 13,250*l.*, and to execute the work without the intervention of a contractor.

The Architect's Department.—On the recommendation of the Establishment Committee, Mr. C. A. Sharp was appointed chief assistant in the general constructional branch of the Architect's Department.

Fires in Premises consisting partly of Projecting Shops.—The Fire Brigade Committee reported as follows:—

"With regard to the fatal fire in Wandsworth-road it may be stated that the outbreak occurred in one of three shops on the south side of that thoroughfare, at the junction of Priory-road. Apparently the premises were originally three separate houses of three stories, and projecting one-story shops were subsequently erected in the gardens in front, between the houses and the pavement. At the time of the fire there were means of communication, by doors and windows, between each of the three shops and also with the houses; some of the doors and windows, however, being blocked up by light wooden partitions. The only means of getting into the yard at the back of the building was through the side of the house and basement on the Priory-road side. A fire alarm is fixed outside the premises, but some thirteen minutes elapsed between the discovery of the fire and the giving of the call. During the last ten days two fires of a serious nature have occurred in the same neighbourhood in shops built over the forecourts of houses in the manner described, and, although fortunately no loss of life occurred, the premises were in both instances severely damaged. Both these fires happened before the occupants had retired to rest. The risks of loss of life arising from fire in premises constructed as described are, in our opinion, so great that we think it essential in the interests of the public that it should be a condition in all cases in which shops are built on the forecourts of houses in the manner referred to, that adequate means of escape should be provided for the occupants of such premises. We have communicated this opinion to the Building Act Committee, and have asked that Committee to consider the desirableness of recommending the Council to seek statutory authority to enable effect to be given to the suggestion."

New Street, Holborn to Strand.—The Building Act Committee have had under consideration the naming of the new Holborn-Strand street, and the crescent into which it will open. They agree with the Improvements Committee that the streets should have two distinct names. Several names have been submitted to them. "Council Broadway" was one suggestion. Another was that the millenary of King Alfred might be commemorated. It was pointed out that the settlement of the Danes here outside the City walls, and on a site which included the modern parish of St. Clement Danes, and was traversed by the old and narrow thoroughfare (now to be abolished) bearing the characteristically Danish name of Wych-street, was most probably due to the peace arranged by King Alfred with the Danes. The names accordingly proposed were "King Alfred-street" and "Danes-crescent." Another proposal was to name the straight street after Shakespeare. The Improvements Committee of the Council pointed out to the Building Act Committee that as the actual work of the improvement was begun in the year which marked the commencement of the reign of the present Sovereign, it would be a fitting opportunity for commemorating that event by naming the street "Edward VII.-street," subject to this course meeting with the approval of the Sovereign. With this suggestion the latter Committee found itself entirely in agreement, and they recommended that, subject to the approval of his Majesty being obtained to the proposal, the new main street from Holborn to the Strand shall bear the name "Edward VII.-street."

It was also suggested to the committee that it would be suitable to commemorate the Queen by naming the other street "Alexandra-crescent." To this name, however, they were constrained to object, owing to the fact that it is already in use in many places in London. The Improvements Committee then informed the Building Act Committee that in their opinion the name "Danes-crescent" would not only preserve the historic associations of the locality, but at the same time be a compliment to her Majesty as a Danish princess. With this suggestion the committee could not agree, but thought that as the Council had already allotted a site in the Strand opposite the eastern extremity of the crescent for the memorial to Mr. Gladstone, it was more appropriate that the name should be "Gladstone-crescent." The Building Act Committee recommended that the new crescent, which will run from Wellington-street to the Law Courts, should be named "Gladstone-crescent."

The consideration of these proposals was postponed, and the Council adjourned until April 22.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Lines of Frontage.

Greenwich.—A one-story shop addition in front of No. 43, Old Dover-road, Blackheath (Mr. A. Roberts for Mr. G. Hall).—Consent.

Westminster.—Blocks of artisans' dwellings to abut upon Page-street, Regency-street, and Vincent-street (Messrs. N. S Joseph, Son, & Smithem for the Council of the City of Westminster).—Consent.

Battersea.—That the resolution sanctioning the erection of a parcels office, milk depot, and covered yard on the northern side of St. John's-hill, Battersea (Mr. S. Bircham for the London and South Western Railway Company), be modified.—Agreed.

Width of Way.

City.—An addition to All Hallows Church, London-wall, City (Mr. H. S. Newton for the Rev. Montague Fowler).—Consent.

Space at Rear.

Westminster.—A block of artisans' dwellings on the south side of Page-street, Westminster, next No. 125 (Messrs. N. S. Joseph, Son, & Smithem for the Council of the City of Westminster).—Consent.

Dwellings for the Working Class.

Westminster.—Two blocks of intended dwelling-houses, to be inhabited by persons of the working class, and proposed to be erected, not abutting upon a street, on a site contiguous to Page-street, Regency-street, and Vincent-street, Westminster (Messrs. N. S. Joseph, Son, & Smithem, for the Council of the City of Westminster).—Consent.

Width of Way, Lines of Frontage and Projections.

Poplar.—A one-story store building in the garden of the Scandinavian Sailors' Home, on the south side of Garford-street, West India Dock-road (Messrs. Niven & Wigglesworth, for Mr. A. Welin).—Consent.

Marylebone, East.—An iron and glass covered way in front of No. 1, Titchfield-road, Regent's-park, with the forecourt fence between such covered way and St. James's-mews at less than the prescribed distance from the centre of the roadway of that street, and with the covered way (Mr. C Roberts for Madam Charles).—Consent.

Hackney, Central.—An iron and glass shelter at the entrances to the Hackney Empire Palace on the west side of Mare-street, Hackney (Mr. F. Matcham for the Hackney Empire Palace Co., Ltd.).—Consent.

Rotherhithe.†—A three-story warehouse building on the south-west side of London-street, Dockhead, Rotherhithe (Mr. V. Dunkerley for Messrs. W. & R. Jacob & Co., Ltd.).—Consent.

Lines of Frontage and Construction of Building.

Norwood.—A wood and iron urinal and two water-closets on part of the forecourt of the New Parkroad Schools, Brixton-hill (Mr. T. J. Bailey for the School Board for London).—Refused.

Formation of Streets.

Wandsworth.—That an order be issued to Mr. F. Newman refusing to sanction the formation or laying out of new streets for carriage traffic on the Streatham Lodge Estate on the north-east side of Streatham High-road, Streatham (Mr. C. H. C. Du Cane).—Agreed.

Woolwich.—That an order be issued to Mr. R. Stewart refusing to sanction the formation or laying out a street for carriage traffic in continuation of Westmount-road, Eltham Park, Eltham, and in connexion therewith the abandonment of the formation of a portion of Westmount-road as sanctioned by the Council (Mr. A. Cameron-Corbett, M.P.).—Agreed.

Kensington, South.—That an order be issued to Messrs. Rolfe & Matthews refusing to sanction the formation or laying out, for foot traffic only, of two new streets to lead from Addison-road to Abbotsbury-road, Kensington (Messrs. Jones Bros.).—Agreed.

Buildings for the Supply of Electricity.

Woolwich.—Additions to the electric light station on the east side of White Hart-road, Plumstead (Mr. F. Summer for the Council of the Borough of Woolwich).—Consent.

Height of Buildings.

Hoxton.—A building on a site at the rear of No. 73, East-road, Islington, to exceed in height the width of Vestry-street, and the retention of buildings on the west side of East-road, Islington, exceeding in height the width of Vestry-street (Mr. G. Blyton for Mr. E. Gates).—Consent.

*** *The recommendation marked † is contrary to the views of the local authority.*

Correspondence.

BUILDING CONTRACTS.

SIR,—Can you inform me whether a builder can claim an extension of the time named for completion, equal to the stoppages caused by wet weather, snow, frost, &c.?

I have a contract now being carried out, and the completion within a certain agreed time is very essential; but the builder has sent in a list showing that on certain days the men did not work because the weather was unfavourable. On many of the days named the loss was two hours, on others three hours, and some even so small as one hour, and for all this an equivalent extension of time is demanded.

To my mind it is frivolous. I could understand being asked for an extension for severe frost lasting over a period of a week or so, but to ask for an allowance for every time a thunder shower drove the men to shelter seems straining the point.

I have got no means of checking such losses of time, but periods of loss caused by snow and frost I can estimate and am willing to allow for.

During the summer months overtime was made, and that more than balanced loss of time owing to rain, for in no week did the men make less than the full ordinary time.

The contract says nothing about an extension of time for loss caused by inclement weather.

COUNTRY ARCHITECT.

EXETER CATHEDRAL.

SIR,—Not having had the pleasure of hearing Professor T. Roger Smith give his very interesting lecture on Exeter Cathedral I am not able to judge whether you report him correctly as stating "The only portions of the old Norman church now remaining are two low massive towers. With the exception of the two towers the cathedral belongs entirely to the decorated or the fourteenth century period." The Norman walls of the nave still stand, cut into and altered at a later date; transitional work of Marshall's time survives; early English is also represented, especially in the lower story of the chapter house; while its upper stage exemplifies the perpendicular style. HARBOTTLE REED.

Exeter, March 25.

PRESBYTERIAN CHURCH HALL, BYKER, NORTHUMBERLAND.—The foundation-stone of the new hall for the Presbyterian Church of England, Gordon-road, Byker, has just been laid. The present contract comprises hall to seat 500, class-room accommodation, and a caretaker's house. Messrs. Badenoch & Bruce, architects, designed the buildings and Mr. Alex. Bruce, who was contractor for the church, is now building the hall. The buildings are in stone, with rock facings, except the back portions of hall and class rooms, which are in brickwork.

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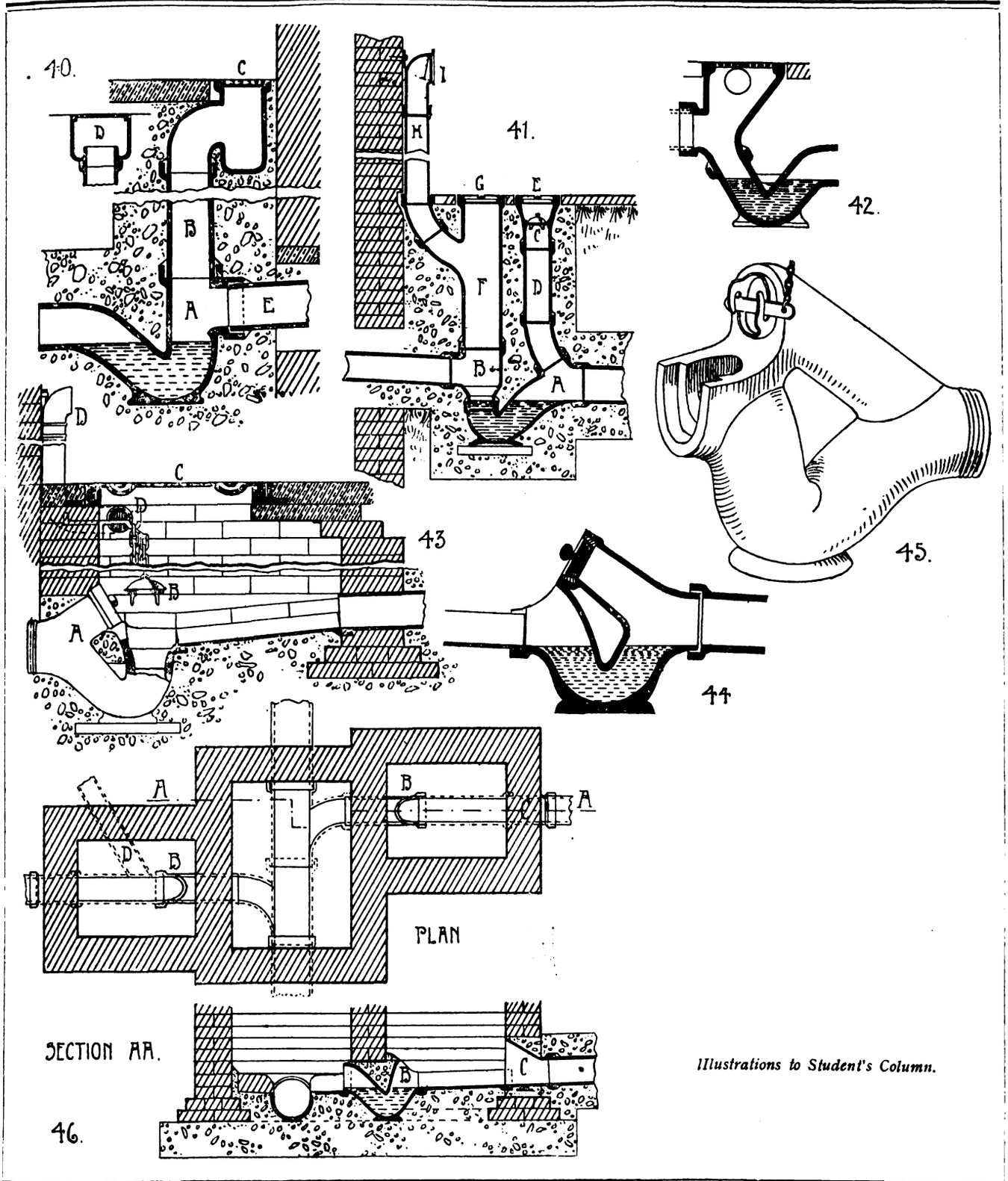

Illustrations to Student's Column.

The Student's Column.

PART II.—DRAINAGE.

CHAPTER II.—INTERCEPTION.

INTERCEPTION.—Under ordinary circumstances, if the drains in small systems are properly laid, the sewage is removed before decomposition has advanced to such a stage as to give rise to unpleasant or unhealthy emanations, but decomposition often proceeds to a serious extent in sewers, and invariably in cesspools, and the foul gases thus generated will pass into the drains unless some barrier is interposed. This barrier almost invariably takes the form of a curved pipe or "trap," which retains sewage in sufficient quantity to prevent air passing from the sewer or cesspool to the drain. A trap of this kind is known as a disconnecting or intercepting trap, but confusion will be avoided by adopting the latter term, and by confining the former to traps placed at the inlets of drains.

The position of this trap is thus defined in the Model By-laws (No. 63 for Urban Districts and No. 16 for Rural Districts) :—

"Every person who shall erect a new building shall provide, within the curtilage thereof, in every main drain or other drain of such building which may directly communicate with any sewer or other means of drainage into which such drain may lawfully empty, a suitable trap at a point as distant as may be practicable from such building, and as near as may be practicable to the point at which such drain may be connected with such sewer or other means of drainage."

The words "within the curtilage thereof" have been variously interpreted, but in the case of buildings abutting directly on the public street the only suitable position for the trap is under the footpath. When a garden or other open space intervenes between the building and the street, the trap may be placed under the open space as close to the fence as possible. In the new London Drainage By-laws the words are omitted, and the trap is more particularly described as "a suitable and efficient intercepting trap." Access as to the trap must also be provided for by "a separate manhole or other separate means of access . . . . for the purpose of cleansing it."

Deposits often occur in intercepting traps on account of the obstruction they offer to the flow of the sewage. Various methods of preventing such deposits have been recommended—among which may be mentioned—(1) traps of smaller diameter than the drains, thus, a 4 in. trap would be used to intercept a 6 in. drain ; (2) traps with the bores contracted to an oval or other shape below the level of the standing water ; (3) traps with a drop of 2 in. or 3 in. from the inlet to the surface of the standing water ; (4) quick gradients in the manhole-channels or drains approaching the traps. All these methods aim at giving an increased scour through the body of the trap, but the first has little to recommend it ; if a 6 in. drain running nearly full is intercepted by a 4 in. trap, the latter cannot discharge the full volume of sewage until a certain pressure has been obtained by the sewage being dammed back in the drain or manhole ; on the other hand, if the maximum flow is not

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nearly sufficient to fill a 6-in. pipe, a 4-in. or 5-in. drain will give better results. The second method is open to the same objection, but to a smaller degree. Traps with a cascade action are better; according to the law of acceleration of falling bodies, a drop of 3 in. allows the sewage to attain a velocity of 4 ft. per second, and this is generally sufficient to prevent deposits if the volume of the flow is ample. Instead of the direct drop from the inlet to the surface of the standing water, a quick curved slope is sometimes adopted, as this causes less splashing and permits a better scour through the trap. In any case the scour is improved by a high velocity of flow in the approach drain, and if this cannot be obtained, a fall of 2 in. or 3 in. ought to be given to the manhole-channel or pipe.

Intercepting traps may be divided into two classes—(1) for use in manholes, and (2) for fixing under pipe-shafts. Simple siphon bends or "running" traps, without eyes for pipe-shafts, ought never to be used. Almost invariably, one of the two openings required for the ventilation of the drain is placed close to the trap, and a pipe-shaft or manhole must be provided for the purpose; either of these affords facilities for the inspection of the trap, but the manhole is, of course, much more satisfactory.

In the case of workmen's cottages, where economy must be carefully studied, the cost of a manhole for every house cannot always be afforded. If a "combined" system of drainage is adopted, one or two manholes may suffice for a row of houses, and in this case the cost per house would not be prohibitive; otherwise, an arrangement like that shown in fig. 40 best meets the difficulties of the case. From the trap A a pipe-shaft B, which serves as an inlet or outlet for air, is carried up to the surface, and finished with a grating C at the level of the footpath; that shown in the illustration is known as Sykes's and has an iron grate with a stoneware dirt-box and junction-piece. A cast-iron frame with hinged lid is often used, a dirt-box being formed under the perforated portion of the lid to prevent dirt falling into the trap. Cregeen's air-inlet is shown at D in fig. 40. The central portion of the grating is solid, and the dirt drops into the annular chamber around the top of the air-shaft; this arrangement allows the trap to be inspected and (in some cases) cleared from the surface of the ground.

A more elaborate arrangement, known as Winser's "Villa Detector" intercepting, testing, and flushing trap is shown in fig. 41. The trap, A, is of the usual P-shape, 4 in. or 6 in. in diameter throughout, or 4 in. at the inlet and 6 in. at the outlet. Above the inlet a junction-piece, B, is fitted, having a tapered seating to receive the plug, C, when it is desired to apply the water test to the approach drain. This plug is made to fit against a seating in the cleansing shaft, D, and forms, with the air-tight cover E, a double protection against the escape of sewer-air through this shaft. The inspection shaft, F, is shown to be finished with an air-tight cover, G, and a galvanised-iron pipe, H, is carried up from a junction-arm to a suitable point and fitted with a mica flap air-inlet grating, I. Instead of this arrangement a perforated grating, with or without dirt-box, can be used at G. A good type of trap for use with a pipe shaft is Hellyer's "Drain Siphon and Sewer Interceptor" (fig. 42), which combines the cascade action and contracted waterway. The drop from the inlet to the standing water in the 6-in. trap is 6 in., the depth of seal 3 in., and the bore of the trap below the dip 4 in.

The "Detector" trap is made in a somewhat different form for use in manholes, as shown in fig. 43. The trap has a cleaning arm, A, fitted with a stopper with Stanford joint. The plug B can be lowered on to the seating of the trap, when it is desired to apply the water-test to the approach drain and manhole. An air-tight cover C is placed over the manhole, and ventilation is provided by the pipe D D. This trap, it will be observed, has a drop of about 3 in. from the inlet to the surface of the standing water. In fig. 44 a trap without cascade action is shown, and may be used where the levels of the drain and sewer are such as to preclude the use of the cascade type, but suitable flushing apparatus ought to be provided in cases of this kind.

Jones's patent "Lever Stopper" (fig. 45) has been specially designed for the clearing arms of intercepting traps. The frame is made with a flange for fitting into the socket of the arm, and is made tight with cement. The stoppin plate is firmly fixed by means of the lever, to one end of which a chain is attached. The upper end of the chain is hung on a hook near the top of the chamber. If at any time the trap is choked and the sewage is dammed up, the stopper can be released by pulling the chain, and nearly all the sewage will escape through the clearing arm into the drain and sewer beyond. A man can then descend without difficulty to clear the trap.

In large drainage systems it is desirable to intercept branch drains from main drains, in order to prevent aerial communication and to facilitate the separate ventilation of the main and of each branch. In hospitals for infectious diseases the drainage of each block ought invariably to be thus intercepted. An ordinary intercepting trap (B, fig. 46) without clearing-arm is suitable for the purpose. A separate inspection chamber for each branch must be formed at the side of the manhole on the main drain, and a trap must be placed in the wall between the main and branch chambers. The branch channels ought to deliver *over* the channel in the main chamber, as otherwise sewage may pass from the main to the side chambers when the main flow is increased by the discharges from flushing cisterns, &c. The sides of the channels may be raised by means of glazed bricks, as shown in the section, or in other ways. The main chamber, unless it is near the connexion with the sewer, must be fitted with an air-tight cover. Each branch chamber must be ventilated either by means of a perforated cover or a branch-pipe and grating after the manner shown in fig. 43. More than one drain from the same building may be connected to the branch chambers if required, as shown at D. Drains passing under buildings may often be intercepted in this manner with advantage, so that foul air from the lower portion of the drain cannot pass under the buildings. In small chambers, in order to facilitate the passage of clearing rods into the drains, "chutes" may be fixed; those shown at C in fig. 46 are on the inlet drains and are known as "reverse" chutes. The ordinary and reverse forms can be obtained in stoneware, enamelled fireclay, or cast iron.

The clearing arms of intercepting traps are not always designed in such a manner as to allow clearing rods to be easily inserted or the drain to be inspected. In one patent trap the clearing arm is in line with the drain below the manhole, and the body of the trap is twisted. This arrangement somewhat obstructs the flow through the trap, but allows the drain to be easily inspected and cleansed.

All traps ought to have flat bases, so that they can be set perfectly level. Otherwise the seal of the trap may be partly or wholly lost by a careless or ignorant workman. Traps of salt-glazed stoneware are generally used, but for the best work white enamelled ware is sometimes preferred; this looks cleaner when new, but the enamel of inferior ware is apt to crack and peel off. Cast-iron traps of the same general design are made for use in connexion with cast-iron drain-pipes.

NEW ENGINEERING ROOMS, BATTERSEA POLYTECHNIC.

ON Saturday evening last week Sir Alexander Binnie opened the new rooms which have been added to the engineering department of the Battersea Polytechnic.

The rooms newly built are the present drawing office (55 ft. by 20 ft) and the engineering lecture-room (35 ft. by 25 ft.) on the first floor. The old drawing office has been converted into the wood-working shop and the old lecture-room into an advanced engineering laboratory, and fitted with new testing appliances and a centrifugal pump. In addition, the rearrangement of the rooms has given larger laboratories for electrical engineering and for engine testing on the ground floor. An improvement is effected by the removal of the drawing office from its former position immediately over the boiler-room, where it was subject to vibration, to a quieter part of the building. The architect was Mr. E. W. Mountford, who designed the original building, and the cost of the rearrangement and alterations, amounting to about 2,000*l.*, has been met chiefly by grants from the Technical Education Board.

Sir Alexander Binnie said he had been very pleased to inspect the engineering laboratories, and what he had seen supported his conviction that students of the present day were exceedingly fortunate. Looking at the history of the pioneers of engineering, he was struck by the advance which had been made in the preparation of men for their work. They had the advantage of valuable knowledge acquired by those men by constant study and long experience, and the use of apparatus to aid them in research which was then unknown. It was at such institutions as this that they were introduced to those forces of Nature which they would afterwards control, and under such favourable conditions they should exert themselves to discover more about some of those forces than was at present known. He then declared the rooms open.

Professor Unwin associated himself with Sir Alexander Binnie's remarks on the splendid opportunities afforded students for advancement, and compared the testing apparatus provided for their use with that of twenty-five years ago, which, although it served its purpose, was very crude and unwieldy.

Dr. Garnett said he considered that as there were so many branches of engineering and so many institutions where its principles were taught, it was advisable that each institution should take up a different branch and make a special point of it. He wished the students to understand the importance of learning not only how, but why, things happen under certain conditions, as this knowledge would tend to their advancement in their study of the subject.

Sir John Jackson said he was glad to see that we began to realise that young engineers must have a proper educational training. There were some who seemed to think that because we had done great things in the past, we could, without undue exertion, hold our own in the future, but he did not agree with them. He was confident, however, that with a proper training we could produce engineers as capable as any with whom they had to compete, if only students on their part would remember that this could only result from steady and constant application to work.

During the evening the various workshops and laboratories were opened to visitors, and some interesting experiments were made with a 10-ton testing machine and the hydraulic pumps and other apparatus, and in the carpenters' shop was an exhibit of excellent work by the students in that department.

OBITUARY.

MR. W. W. WILLIAMS.—*The death has just occurred at Clydach of Mr. Wm. Watkin Williams, architect, of Swansea. The deceased, who was thirty-eight years of age, was at one time a working mason, having been apprenticed to Messrs. Walters & John, builders, Morriston. He was a student at the Swansea Art School, under Mr. F. F. Hosford, and about ten years ago he started practice as an architect. Since that time he designed the plans for several new chapels in the district, and in the Swansea Valley. In addition, the deceased prepared the plans for many schools, including the Wern Schools, Ystalyfera, the Alltwen Schools, and the Pontardawe Schools.*

GENERAL BUILDING NEWS.

WESLEYAN BUILDINGS, SUNDERLAND.—A new Wesleyan church, built in Durham-road, Sunderland, was dedicated and opened on the 11th inst. Its erection is part of a scheme of circuit reorganisation, rendered necessary by the moving in a westward direction of the members of the old Fawcett-street Circuit. This scheme consists of the abandonment of three old places of worship, and the building of three new ones. The total cost of the land and buildings will reach something approaching 30,000*l.* The church just opened is cruciform in plan, and has a tower and spire rising to a height of 100 ft. There is accommodation for 800 people, and behind the church is a large schoolroom, with a gallery running round, off which open eight class-rooms. The buildings, which were designed by Mr. J. Jameson Green, of Liverpool, have cost about 9,000*l.*, and the cost of the site was 6,000*l.*

METHODIST CHURCH, NEWPORT, I.W.—A new Methodist church has been erected at Hunnyhill, Newport, at a cost of 1,000*l.* The church, which seats 200 persons, is built of red brick, the roof being of pitch pine, slated. There are no pews. The work has been carried out by Messrs. G. W. Ball & Son, of Cowes, and Mr. S. E. Tomkins was the architect.

ADDITIONS TO ST. ERTH CHURCH, HAYLE, CORNWALL.—The additions to the roof of the south aisle of this fifteenth century West Cornish church are now complete. Working from the designs of Mr. Sedding, architect, the old oak timber has been enriched by the addition of a number of carved bosses—something like one hundred of them—all of varied design. The eastern end of this aisle has been made into a morning chapel, and there the roof has been improved by carved crows' feet projecting from new bosses, and by carved and enriched panels. These additions have been carried out by Messrs. Harry Hems & Sons, of Exeter.

LIBRARY, KINNING PARK, GLASGOW.—A new public library is about to be erected in West Scotland-street, Kinning Park. The library is a gift to the burgh from Dr. Carnegie, and will be known as "The Carnegie Library." The principal entrance is from West Scotland-street, through a semicircular doorway, having polished granite columns. The

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vestibule leads to a large hall, measuring 30 ft. by 9 ft. north and south, and 48 ft. by 11 ft. east and west. From this hall access is gained to the lending library, 34 ft. by 30 ft., the reference library, 18 ft. by 23 ft., the librarian's room, and a book store. On the upper floor there is a ladies' reading-room, 18 ft. by 37 ft., with a cloakroom and customary lavatory accommodation. On the next floor there is a gentlemen's reading-room, 45 ft. by 30 ft., and a boys' reading-room, 37 ft. by 20 ft., and a magazine-room, with cloakroom and lavatory accommodation, the latter being panelled and lined with mosaic. The walls of the apartments will be finished with wood panelling, 6 ft. high, and stained and varnished; while the floors will be laid with maple in narrow breadths, the entrance-hall having mosaic and encaustic borders. The building throughout will be heated on the low-pressure system by hot-water pipes and radiators. All the apartments will be lighted by electricity. The approximate cost of the buildings is 5,000*l.* The architects are Messrs. Bruce & Hay, Glasgow.

RECONSTRUCTION OF THEATRE, BISHOP AUCKLAND.—The Eden Theatre, Bishop Auckland, is to be reconstructed from plans by Mr. F. H. Livesay. Mr. W. Hudson, builder and contractor, Bishop Auckland, is the contractor for the work, and the sub-contractors will be as follows:—Masonry, Mr. G. H. Bell; painting, Mr. R. Thompson; plumbing, Messrs. W. Kilburn, Ltd.; plastering, Mr. Kirby; and slating, Messrs J. and R. Mascall.

BUILDINGS IN ABERDEEN.—The plans of the following buildings have been passed by the Plans Committee of the Town Council:—Alterations and additions in connexion with factory on the south side of Charles-street, for Mr. R. Gordon, per Messrs. Brown & Watt, architects (amended plan); stable on the north side of St. Peter-street, for Mr. James Lamont, per Mr. David Porter, builder; dwelling-house on the north side of Fonthill-terrace, for Mr. A. J. Tulloch, per Messrs. Sutherland & Pirie, architects; two dwelling-houses on the south side of Murray-terrace, for Messrs. James Shand and William Slater, per Messrs. Sutherland & Pirie, architects; addition to weaving sheds on the east side of Berryden-road, for Kilgour & Walker, Ltd., per Mr. R G. Wilson, architect; alterations in connexion with premises Nos. 335-339, George-street, for Mr. Richard Hallglen, per Mr. George H. Jolly, architect; stable at the rear of dwelling-house on the north side of Ashgrove-road, for Mr. Thomas Kemp; entrance porches at Westfield Public School, for the Aberdeen School Board, per Mr. J. A. O Allan, architect; premises on the west side of Union-terrace, for the Scottish Life Assurance Co., Ltd., per Messrs. Sutherland & Pirie, architects.

MUSIC HALL, DUDLEY.—Plans for the erection of a new music hall at Dudley have been prepared by Mr. Arthur Gammage, architect, and at the Police-court on the 19th inst. they were approved by the magistrates. It is proposed to erect the building on a site in Hall-street. According to the plans it will have a frontage to the main thoroughfare of 66 ft. with three stories in the centre, flanked on each side with two stories having flat roofs for the convenience of visitors in summer, and ornamental turrets. The main entrances will be from Hall-street, and the principal entrance to the pit from Dudley's-row. The exterior of the building, which will be 110 ft. long, will consist of brick, with terra-cotta or stone dressings in the front; and seating accommodation will be provided for about 2 000 people. The plans have yet to be passed by the Town Council.

LUNATIC ASYLUM, CLARE, IRELAND.—The committee of management having decided to enlarge the present asylum, which was built thirty-five years ago, invited applications from architects for the position of architect. Mr. Francis O'Connor, of Ennis, was selected to prepare the necessary plans and superintend the works. The new buildings will accommodate 400 chronic patients who are now housed in the different workhouses throughout the county. The estimated cost of the proposed works is 35,000*l.*

THE ARCHERS' HALL, EDINBURGH.—We learn that Dr. Rowand Anderson has recently carried out for the Royal Company of Archers of Scotland a reconstruction and enlargement of their hall, at No. 66, Buccleuch-street, Edinburgh. Of the old buildings, which surround a quadrangle about 40 ft. square, the walls remain. The interior has been remodelled, and the chief alterations comprise its division into three floors, with a new grand staircase that leads up to the dinner-hall or mess-room, and a reception-room, measuring 40 ft. by 20 ft., in one side of the building.

POLICE-COURT, MOUNTAIN ASH.—The new police-court attached to the police-station at Mountain Ash was used for the first time on the 19th inst. The building is constructed of native stone, with Bath stone dressings. The courtroom is 36 ft. long by 24 ft. wide, and connected therewith are a room for the justices (16 ft. by 14 ft.) and a witnesses' room (13 ft. 6 in. by 12 ft. 6 in.). The whole of the woodwork is of varnished pitch-pine The plans were prepared by Mr. T. Lloyd Edwards, the County Surveyor; and Mr. Shepton, of Penarth, was the contractor.

GYMNASIUM, ABERTILLERY.—A new gymnasium attached to the Tillery Workmen's Institute, Abertillery, has just been opened. The gymnasium is 80 ft. long by 38 ft. wide. It is a hall capable of being used also as a concert-room, with seating accommodation for 600 to 700 persons. It was built at a cost of about 2,500*l.* by Mr. D. J. Davies, of Newport, from plans by Mr. F. R. Bates, architect, of Newport.

ISOLATION HOSPITAL, RHONDDA, WALES.—The Rhondda Urban Council's New Isolation Hospital was opened on the 13th inst. The building is situated at the junction of Penrhys-road and Hospital-road, Ystrad, Rhondda. The hospital is composed of seven blocks of buildings, viz., the administrative block, scarlet fever pavilions, typhoid pavilions, laundry and disinfecting block, mortuary, discharging block, and stable. The whole structure is of local stone, surrounded by a wall, and within the enclosure is room for extension of the hospital. Accommodation is provided for thirty-two patients. The cost amounted to 13,385*l.* The plans were prepared by Mr. W. D. Morgan, architect, Ton, whose plans were selected in competition.

COTTAGE HOMES, DOWNEND, BRISTOL.—Cottage homes for children are about to be erected by the Bristol Guardians at Downend. The walls are to be of Pennant stone, with brick bands and dressings, and the roofs covered with tiles. There will be fourteen houses, each for twelve children and a matron. The porter's lodge adjoins the entrance-gates, and the convalescent home (with accommodation for thirty-six) is at the end of the private road. The hall is in the centre of the group, and will be used for school and recreation purposes. The architects for the scheme are Messrs. La Trobe & Weston, Bristol.

MUNICIPAL HALL, &C., COLNE, LANCASHIRE.—The municipal hall, public library, and technical schools erected by the Corporation of Colne at a cost of 10,000*l.*, were opened on the 15th inst. The buildings have a main frontage to Albert-road, the principal thoroughfare of the town. The public hall (which will seat 1,000 persons), and library are approached by the elevation to Albert-road, and the technical schools occupy the rear portion of the building, which was erected from the designs of Messrs. Woodhouse and Willoughby, architects, of Manchester.

ADDITIONS TO BIRKENHEAD INSTITUTE.—The present additions to this building complete the facade to Whetstone-lane. They comprise an entrance hall with cloakroom accommodation, &c., and classroom 24 ft. 6 in. by 22 ft. on the ground floor. The first floor is an extension of the science department in the shape of a physical laboratory. Attached to this laboratory are a small workshop and dark room for special optical experiments. The building has been designed and erected under the superintendence of Messrs. T. Mellard Reade & Son, architects, Liverpool. The contractor for the present additions is Mr. Charles Burt, of Liverpool.

FOREIGN.

FRANCE.—The subject given this year to architectural competitors for the Prix de Rome is "Une Imprimerie Nationale." The subject (for once) is a strictly practical one, as Parliament has actually voted the rebuilding of the State printing establishment.——M. Trawinski, well known for his artistic and literary works, has been appointed chief secretary of the National Museums department ——The curious portal of the ancient Bureau of "Marchandes Lingères," which the Committee of Vieux Paris has saved from destruction, has been rebuilt in the Square des Innocents, near the Halles Centrales.——The municipality of Sainte Savine (Aube) has opened a competition for the construction of a new covered market.—— The works are shortly to be commenced for the formation of a railway line from Paris (Mont-Parnasse) to Chartres, by way of Chevreuse and Gallardon.——The Municipality of Bordeaux intend to build a bridge across the Garonne, opposite the Place Richelieu. A new bridge is also to be built at Marseilles between the Quai de la Tourette and the opposite boulevard, to form a more convenient transit over the "Old Port," which at present has to be crossed in boats.——The Corporation of Rennes has voted a sum of 300,000 francs for the completion of the new Church of St. Aubin.——The jury in the competition opened for the construction at Ambert (Puy de Dôme) of a new Savings Bank, has awarded the first premium to M. Chanet, architect, of Vichy, who is to carry out the building.——The preliminary works are shortly to be entered upon for the transformation and prolongation of the canal of the Ourcq to Crecy-en-Mont, and the formation of a new port at la Villette, on the site of the old fortifications.——The celebrated Hôtel de Païva, in the Avenue des Champs Elysées, has been sold by auction. There had been some talk of making it the Mairie for the VIIIth. Arrondissement, but this idea was abandoned. The house, decorated by Baudry, Delaunay, Gustave Boulanger, Carpeaux, and Dalou, has been acquired by a financial society, which intends to convert it into offices.——The Municipality of Paris has announced that in case of the Government deciding to light the Tuileries garden by electricity, the city will pay 95,000 francs towards the installation, and give an annual subscription of 11,500 francs.

UNITED STATES.—Thirty-six artists are in the important competition for the statue or memorial to General Grant, to be erected in Washington. Amongst them are several well-known American architects. The competition is to be closed on April 1. All competitors are required to submit models, on a scale of 1 in. to the foot. Six designs will first be selected, and, after public exhibition, the final selection, carrying with it the execution of the work, will be made from amongst these.—— The National Sculpture Society proposes to hold two exhibitions this year, one in April and the other in October. The April exhibition is to be held in New York, and will be devoted to statuettes, medals, and small objects generally, whilst the October exhibition, which will be held in connexion with the New York Florists' Club in that city, will consist of larger works.—— The Boston Museum of Fine Arts has received a large collection of classical antiquities, including a number of Greek terra-cottas and about 100 Greek vases, and the curators are now arranging them for public exhibition.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—The Iroquois Machine Co. (New York) has just been incorporated as a New York company, having purchased the plant and business of the Universal Machine Co. (Providence), and rented a large additional business adjacent. —— The Vulcanite Company (late the Patent Vulcanite Roofing and Asphalte Company) have removed their London offices from 2, New Union-street, to 118, Cannon-street, E.C.——Mr. Robert J. Beale, architect and surveyor, has removed his offices from Broadway House, Westminster, to 17, Old Queen-street, Westminster.

SALFORD IMPROVEMENTS.—On the 21st inst., at the Salford Town Hall, Mr. F. H. Tulloch, C.E., a Local Government Board Inspector, held an inquiry as to the sanction of a loan by the Corporation of 23,562*l.* for the purposes of depots at Agecroft, Carey-street, and Wilburn-street, and also for the purpose of erecting refuse destructors at Carey-street and Wilburn-street. A description of the details of the proposed improvements was given by Mr. J. Corbett, Borough Engineer; Superintendent Hamblett, scavenging department; Mr. Sharpe, architect, and others.

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.—On Friday evening, the 21st inst., Mr. Jas. McLeod read a paper to this Society entitled "Prevention of Damp in Walls," Mr. Alex. Davie, I.M., occupying the chair. The lecturer, in a general manner, made reference to the common defects in workmanship which facilitated the penetration of moisture to the interior of a wall, and spoke of the special precautions necessary to prevent dampness from materially affecting the structure. Descriptions of the various preservatives of stone and brick were also given, and samples of stone, demonstrating the effect of some of these, were exhibited.—A visit took place on the Saturday afternoon following to the "Stevenson Memorial Church," of which Mr. J. J. Stevenson is architect, and which was recently opened. This church is a Gothic edifice with Scottish treatment, situated at Belmont Bridge, overlooking the River Kelvin (it has been illustrated in the *Builder*). The interior shows an effective use of white pine finishing, which is very successful. The party were conducted over the building by Mr. George Calvert, clerk of works. A sketching party of the Society intend visiting Birmingham, Worcester, and Lichfield at Easter, under the guidance of Mr. Jas. McKissack.

ROMAN REMAINS IN GREENWICH PARK.—As the result of further excavations carried out by Mr. A. D. Webster, Superintendent of Greenwich Park, assisted by Mr. Herbert Jones, the floor of one of the rooms of a Roman villa, with a considerable portion of the tesserae intact, has been laid bare. A number of Roman coins, decorated wall plaster, and many pieces of pottery have also been discovered. Mr. Webster has had the floor left uncovered and fenced round in order that the public may have an opportunity of viewing these remains.

PROPOSED WIDENING OF LEADENHALL-STREET The Corporation are contemplating widening the Aldgate end of Leadenhall-street, which at present is much too narrow for the increasing traffic. The London County Council have been asked to contribute half the cost. The County Council have suggested that the Corporation should do portions of the work as opportunity offers when leases fall in or when premises are being rebuilt. The Corporation at present are not in favour of adopting that course. The improvement would cost between 600,000*l.* and 700,000*l.*

THE GLADSTONE MEMORIAL IN EDINBURGH.—A meeting of the local Committee charged with the erection of a memorial of the late Mr. Gladstone in Edinburgh was held in the City Chambers on the 18th inst., when the site was finally fixed upon. The Town Council, in granting a site for the memorial, resolved upon the removal of the statue of Alexander and Bucephalus to another site. The statue in question occupies the centre of the space between St. Andrew-square and George-street, and it has been arranged to place the Gladstone memorial on a site much nearer and closely adjoining the pavement. A sketch plan of the ground showing the

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space to be occupied by the memorial was before the Committee, and the Town Clerk was asked to instruct the sculptor (Mr. Pittendrigh Macgillivray, R.S.A.), now that the site has been determined upon, to proceed with the preparation of designs, it being understood that, when a design is agreed to, a rough model, showing the proportions of the memorial, will be put up on the site. It is understood that in connexion with its erection something like 6,000*l.* may be expended.

THE PROPOSED POLICE-COURT BUILDINGS AT SMETHWICK.—On the 18th inst., at a meeting of Smethwick Town Council, the Watch Committee reported that they had considered the competitive designs for the proposed new police buildings to be erected in Halford-street. Four sets of plans were received, and the Committee recommended that the plans of Mr. J. P Osborne, at a cost of 12,656*l.*, be accepted. Councillor Forster moved the adoption of the report. Alderman Bowden advocated the acceptance of the plans of Messrs. Wood & Kendrick (9,000*l.* or 10,000*l.*). After further discussion, Councillor Lloyd moved an amendment that the plans of Messrs. Wood & Kendrick be accepted. Councillor Lees seconded the amendment, which, upon being put to the vote, was defeated by 12 votes to 5. Councillor Yates then moved that the plans be referred back to the committee for further consideration, and for the services of a professional assessor to be obtained. Councillor Adams seconded. Nine members voted for the motion and nine against. The mayor gave his casting vote in favour of the motion. Councillor Forster said the committee would simply bring the plans back to the Council again. He maintained that it was unfair to the architects, and he was determined to resign his position. Two other gentlemen expressed similar views. Alderman Bowden said it was a serious business, and he hoped the members would not carry out their intention. The matter then dropped.

STOCKWELL TRAINING COLLEGE.—The British and Foreign School Society have appointed Mr. J. Osborne Smith as their architect for a three-story addition they are about to make to their Training College in Stockwell-road, Brixton. The college was first built upon its present site for the Society in 1859-60, at a total cost of about 17,550*l.*, by Mr. Beck, whose designs, after the Italian style, provided accommodation for 100 students, with a range of practising schools and girls' and infants' schools in the rear. The buildings have since been enlarged to receive 130 resident students, and an increased number of non-resident students.

CITY OF LONDON (STREETS) BILL.—The Select Committee of the House of Commons, of which Mr. Caine is Chairman, have decided that the preamble of the Bill is not proved in so far as it relates to the laying down of mains for water, gas, or electricity. They have ordered the Bill should be reported to the House (with an amending clause for exemption on behalf of the Temple) in respect of its building and sanitary regulations, which provide that precautions shall be taken to protect the public from injury and annoyance during the erection and demolition of buildings, and require that occupiers shall use receptacles after an authorised or prescribed pattern for the out-door collection of their contents by scavengers. As originally introduced by the Corporation, the Bill was intended to obviate the manifold inconveniences and delays and hindrances which attend the frequent and repeated openings of the streets, and to empower the Corporation to frame regulations to secure uniformity of notice, sequence in which the streets should be blocked or taken up, and the fixing of a close time during which the streets should not be opened, any case of proved emergency excepted. It appears that there are as many as nine different bodies which, as matters now stand, have what is in effect a free charter of unrestricted interference with the course of traffic in the metropolis.

BIRMINGHAM SCHOOL BOARD AND THEIR ARCHITECTS.—At the last meeting of the Birmingham School Board, the Sites and Buildings Committee recommended the appointment of Mr. H. T. Buckland as architect at a salary of 600*l.* per annum; of Mr. A. Rowse, as quantity surveyor, at a rate of remuneration of 1½ per cent. on the tenders; of Messrs. Fowler, Pemberton, and Bewlay, as land surveyors, at a commission of ¾ per cent. on the purchase money; the several engagements to date from May 1 next, and to be subject to the general conditions adopted by the Board on January 31 last. Mr. Pentland moved as an amendment that the part of the report concerning the appointments should be referred back to the committee. He feared that if the resolution were carried matters would be worse than under the old system. The resolution, he declared, was, too, in contradistinction to the one passed by the committee, which was that an architect was to be appointed whose duties were primarily to be connected with the erection of new schools or important undertakings. If his amendment was not adopted he should move at the next meeting that the resolution concerning the architect be rescinded. —The amendment did not receive a seconder. The Chairman, in reply, admitted that he had changed his mind. After careful inquiry he came to the conclusion that it would not be to the advantage of the buildings if they were to put up each school in turn for competition. He added that if it was afterwards found that the system did not answer, he should not hesitate to propose that the engagement be terminated by three months' notice. The resolution was carried by eleven votes to two.

NORWICH AND DISTRICT MASTER BUILDERS' ASSOCIATION.—The third annual dinner in connexion with the Norwich and District Master Builders' Association took place on the 20th inst at the Royal Hotel, Norwich, when about 100 members and friends were present. The President of the Association (Mr. James S. Smith) occupied the chair. After the loyal toasts, the Chairman said that the Association had been in existence for four years, and during most of that time they had had as their President Mr. G. E. Hawes. The members wished to show their appreciation of his services by a small token of esteem and regard. He had great pleasure in presenting to Mr. Hawes, on behalf of the members, a pair of silver candlesticks, and trusted they would remind him and his family of the services which he had rendered the Association. Mr. Hawes, who was received with applause, said that if his work for the Association had benefited the builders of Norwich, that alone would have gratified him without the handsome presentation. He heartily thanked them for their kindness.—The President proposed "Prosperity to the City of Norwich," and spoke of the vast strides made in the city during the past fifty years. Mr. J. A. Porter replied. The Vice-Chairman (Mr. J. Youngs) in proposing "Success to the Architects and Surveyors," spoke of the large blocks of buildings which of late had been erected in the city. To the City Engineer they were greatly indebted for the great progress made in sanitary service. The way in which he had carried out the system of sewers showed that he belonged to the first rank in his profession. He coupled with the toast the names of Messrs. A. C. Havers, T. Inglis Goldie, and A. E. Collins. These gentlemen briefly responded, and Mr. G. E. Hawes then gave "The health of the Merchants of Norwich," the replicants being Messrs. J. L. N. Barnard, R. E. Thorns, and E. Ranson. Mr. E. Ranson proposed "Success to the Norwich and District Master Builders' Association." The President pointed out that the Association was not formed for the purpose of being antagonistic to the men, because in the first rule of their Association it was stated that its objects were conciliation, and that was what they always aimed at. It had proved a hard thing to the builders to provide against accidents, and consequently an insurance association had been started. Several members had joined and he hoped many more would give their names to the secretary. "The health of the Visitors" was proposed by Mr. G. S. Tinkler, and responded to by Messrs. W. Gunton and S. Tungate.

CAPITAL AND LABOUR.

ARBROATH MASONS' WAGES.—The Arbroath master masons have declined to entertain a request by their employees for an increase of wages from 8d. to 8½d. per hour, for a reduction of the hours of work by one hour on Saturdays in winter, and for an extra ½d. per hour on all jobs outside the burgh boundary up to two miles, and 1d. beyond that distance. The masters state that the present state of trade does not warrant any change in present arrangements.

LEGAL.

ACTION BY A BUILDER AND CONTRACTOR.

THE case of Lazenby *v.* Pickering came before a Divisional Court of King's Bench, composed of the Lord Chief Justice, Mr. Justice Darling, and Mr. Justice Channell, on the 20th inst.

Mr. Mote said this was an application on behalf of the plaintiff to set aside the award of a special referee on the grounds of its uncertainty in reference to damages and its uncertainty in regard to costs. The plaintiff was a builder and contractor, and the defendant a clay tobacco-pipe manufacturer of West Hartlepool. The plaintiff agreed to build two houses and a shop in West Hartlepool for the defendant according to the plans and specifications of one Macdonald, an architect, since deceased. When he had finished the work plaintiff claimed to be entitled to 65*l.* for extra work. The defendant denied that he was entitled to more than 23*l.* 4s. 6d., and counter-claimed for 108*l.* for work which he said the plaintiff had omitted to do. The trial lasted two or three days, and on August 14 last the arbitrator made his award, giving the plaintiff 11*l.* 3s., and also awarding the defendant 83*l.* 15s. He added that the above items did not include costs. He was asked whether the 11*l.* 3s. was in addition to the 23*l.* 4s. 6d., and what he meant by his order as to costs, and he made a second award, in which he awarded the plaintiff 23*l.* 4s. 6d., and the defendant 83*l.* 15s., and directed judgment should be entered for the defendant for the balance of 60*l.* 10s. It was pointed out to him that it was admitted 23*l.* 4s. 6d. was due, and inquiry was made of him what had become of his first order in regard to the 11*l.* 3s. in his first award. He now filed an affidavit in which he said he had omitted that by mistake, and judgment should be entered for the defendant or 49*l.* odd. It was submitted that the matter ought to be referred to the official referee, so that a proper decision could be arrived at.

Counsel having addressed the Court on behalf of the defendant,

Their Lordships, in the result, declined to set aside the award, as by consent it was agreed that it should be altered to 49*l.* 7s. 6d.

The plaintiff was, however, awarded the costs of this application.

WOODFORD URBAN DISTRICT COUNCIL *V.* STARK.

THE case of the Woodford Urban District Council *v.* Stark came before a Divisional Court of King's Bench, composed of the Lord Chief Justice of England, Mr. Justice Darling, and Mr. Justice Channell, last week, on the appeal of the District Council from the dismissal of two informations under the Public Health Act, 1875. It appeared that Stark, the respondent, deposited with the Council a notice of his intention to build two houses in the Maybank-road, Woodford, and a block plan, which showed a combined drain for the two houses, was attached to the notice. On the report of the Surveyor, the Council disapproved of the notice and plan on the ground that the proposed drainage was unsatisfactory, and they made an order under Section 25 of the Public Health Act, 1875, directing that there should be a separate drain for each of the houses. This section enacted that it was not lawful in an urban district to erect a house unless covered drains be constructed of such size and materials and at such level and with such fall as on the report of the Surveyor might appear to the Urban Authority to be necessary for the effectual drainage of such house. The district Surveyor discovered on inspection that Stark had constructed a combined drain for the two houses, as shown on the plan, and then the District Council caused two informations to be laid against him, one in respect of each house, the charge against Stark being for building a house without making a covered drain or drains of the size and materials and at such level and with such fall as appeared to the District Council necessary on the report of their Surveyor. The Justices came to the conclusion that the appellants were not entitled to take into consideration anything but size, materials, level, and fall, and that they had no power to order a separate drain for each house, and they accordingly dismissed the informations.

At the conclusion of the arguments the Lord Chief Justice, in giving judgment, said he was of opinion that Section 25 of the Act meant that there should be a separate drain for each house, and remitted the case to the Justices with an intimation that they were not justified in refusing to deal with the case on its merits, because the complaint of the District Council was in respect of the fact that the drain was for more than one house.

Mr. Justice Darling and Mr. Justice Channell concurred, and the appeal was accordingly allowed.

Mr. Macmorran, K.C., and Mr. Naldrett appeared for the appellants, and Mr. C. A. Russell, K.C., Mr. Courthorpe-Munroe, and Mr. W. W. Grantham for the respondent.

PAVING CASE AT TOOTING.

IN the Court of Appeal on the 21st and 22nd insts. the case of The Property Exchange, Ltd., *v.* The Wandsworth Board of Works came on for hearing before the Master of the Rolls and Lords Justices Romer and Mathew. It was an appeal of the company from a decision of a Divisional Court, deciding the question raised in the special case in favour of the respondents, the Mayor and Corporation of the Borough of Wandsworth, who were the successors of the Board of Works for that district. The special case was stated by a Metropolitan police magistrate, who had ordered the company to pay to the respondents 69*l.* 11s. 3d., the amount of expenses apportioned to them for paving the north side of Totterdown-street, Tooting. The appellants denied liability on the ground that the street in question was not a new street. It seemed that Totterdown-street had for many years prior to 1855 existed as a road 16 ft. wide, and was used for wheel and foot traffic, and that since that date it had been regarded as a public thoroughfare, and been repaired by the Local Board. On the south side was a row of houses built some seventy-five years ago. In 1898 the roadway was widened to 40 ft., and a new street, known as St. Cyprian-street, was made, running into Totterdown from the north, and the lands on the north side of Totterdown were laid out for building. The company owned premises in St. Cyprian-street, and the road having been paved, the charge was made on the company, as being one of the frontagers whose property abutted on the highway. The appellants contended that the former 16 ft. of roadway was an old street, and therefore its character was not altered by reason of the fact that a strip of land on one side had been added on to widen it. They submitted, moreover, that the apportionment was bad, because the owners of property on the other side of the road had not been made contributories. The magistrate held that the portion of the roadway ordered to be paved was a new

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street, and that the resolution and apportionment of the Board was valid. The Divisional Court (the Lord Chief Justice and Mr. Justice Lawrance) upheld that decision, expressing an opinion that the strip of land, 24 ft. wide, added to the roadway in 1898 was a "new street," and that the owners of property on the north side only were, therefore, liable to contribute to the expenses of paving it. From that decision the company appealed.

Mr. Richards, for the appellants, contended that, having regard to the fact that 16 ft. of the roadway was an old street, the whole must be treated as an old street, and further, that as regarded the new portion of the roadway, the frontagers on both sides should have been charged.

Mr. Mattinson, K.C., and Mr. J. C. Earle, for the respondents, were not called on, their Lordships affirming the decision of the Divisional Court and dismissing the appeal with costs.

ENDANGERING THE STABILITY OF HOGARTH HOUSE, CHISWICK.

THE case of Shipway *v.* Percy, came before Mr. Justice Buckley in the Chancery Division on the 24th and 25th insts. It was an action in which the plaintiff claimed an injunction restraining the defendant, his agents, and servants from digging or getting any gravel, sand, or soil from and making any pit in the land adjoining or adjacent to the plaintiff's house in such a way as to damage or injure it, and from doing anything which would deprive the plaintiff's house of support from the adjoining or adjacent land; a mandatory injunction ordering the defendant to fill up the said pit or to restore the land to the condition it was in before the pit was dug. The plaintiff also claimed damages.

It appeared that the plaintiff was the owner of Hogarth House, Hogarth-lane, Chiswick, having purchased the premises in January, 1902. The house was an ancient house, and the plaintiff alleged that he was entitled to have the same supported by the land adjacent thereto. Plaintiff's case was that the defendant had excavated a large pit on the land adjacent to the plaintiff's house and premises, and had taken away and removed a large quantity of sand and gravel, and had withdrawn the support to which the plaintiff alleged his house and premises were entitled. The defendant had excavated the pit to a depth of more than 20 ft., and water under the land on which the plaintiff's house was built, and the adjoining land, was drained into the pit. There was at the commencement of the action considerable depth of water in the pit, and the defendant, besides taking away and removing sand by digging, was dredging in the pit for and removing sand. The plaintiff alleged that by the action of the defendant the stability of his house was seriously endangered.

The defendant by his defence stated that so long ago as December, 1900, he commenced to dig and carry away sand and gravel from his land adjoining the plaintiff's house, and in so doing excavated a pit to the depth of 18 ft. In no place did such excavation reach a nearer point to any part of the plaintiff's house than 10 ft., and the strip of solid earth so left afforded an adequate support to the plaintiff's land and house. There had been no subsidence of the land or house or any damage done by reason of such excavations. The defendant alleged that as he proceeded with his excavations he kept filling in the pit from the side nearest to the plaintiff's house with gravel soil and thereby formed a sound and consolidated road of the width at the surface of from 28 ft. to 30 ft. from the house with a slope extending outwards from the top edge of the pit measuring in width at the bottom of the slope 59 ft. from the house. This formed a solid road, along which the defendant's carts passed in order to tip earth into the excavation. The defendant denied that there had been any damage of water being drained from under the land on which the plaintiff's house was built on the adjoining land into the pit, such as to interfere with or endanger the stability of the plaintiff's house. At the depth of about 17 ft. from the surface, and from thence for another 4 ft. or 5 ft. vertical to the stratum of hard clay, which underlies it, water was found, mixed with sand, gravel, and ballast, in the proportion of about one-third sand and gravel to two-thirds ballast. Defendant said that at the commencement of the action he was removing the sand from this wet strata by dredging, and the nearest point at which this was being carried on to the plaintiff's house was upwards of 100 ft. Defendant denied that the water percolated through plaintiff's land to his pit carrying with it the sand, thereby imperilling the stability of the house. The defendant further alleged that the plaintiff's house, though old, would not in any way be disturbed by his operations. The reply was a general denial of the allegations in the statement of defence.

Mr. Astbury, K.C., and Mr. R. Neville appeared for the plaintiff; and Mr. H. Terrell, K.C., and Mr. Manby for the defendant.

On behalf of the plaintiff, expert geologists stated that there was silt under the soil which ran into the pit.

Mr. Arthur Ramsden, engineer and surveyor to the Chiswick Urban District Council, said he had inspected the pit on the defendants' land and in his opinion the buildings around the pit, including the plaintiff's house, were being endangered by the defendant's dredging operations. In his view running sand was under the soil of the plaintiff's house and drifted toward the pit, endangering the plaintiff's house.

This was the plaintiff's case.

Mr. Terrell submitted that there was no case for the defendant to answer.

His Lordship, however, thought there was evidence that running sand existed and that the defendant had better call his witnesses.

Defendant was then called. He said that he excavated his land near Hogarth House to a depth of 17 ft. when he found water. He then dredged for 6 ft. through sand and found clay. After he had removed all the sand, he did not see that any more sand percolated through. As he excavated, so he filled in with all kinds of rubbish, mostly clay, however. He hoped to have the pit filled up within nine or twelve months.

Other evidence having been given, his lordship, in giving judgment, said the question he had to determine was whether the operations of the defendant had resulted in a movement of the soil from under Hogarth House so as to diminish the support to which Hogarth House was entitled from the adjacent land. From the evidence, he arrived at the conclusion that it had. From the whole of the evidence he found that there had been a movement, and that there was danger, and considerable danger—real danger, not fanciful—if those operations of the defendant continued. Under the circumstances, he granted an injunction against the defendant, with costs.

ANCIENT LIGHT DISPUTE AT PORTSMOUTH.

MR. JUSTICE JOYCE, in the Chancery Division on the 24th inst., delivered judgment in the case of Easton *v.* Isted, an action brought by the plaintiff, the owner of the Golden Fleece Hotel at Portsmouth, to restrain the defendant from obstructing an alleged ancient light in his building. The facts sufficiently appear from the following judgment.

Mr. Justice Joyce, in delivering judgment, said that the parties were next-door neighbours in Commercial-road, Portsmouth, the plaintiff being the owner of the Golden Fleece Hotel, the action being brought in respect of the obstruction, or alleged obstruction, by the defendant of the access of light from the yard at the back of his premises to a window or skylight of the hotel on the northern side. The plaintiff complained of a wall erected by the defendant so close to the line of boundary as to obscure the access of light to the window or skylight in question. The plaintiff alleged that this skylight was an ancient light, and that he was entitled to an unobstructed access of light, which had been enjoyed for over twenty years without interruption. The defendant denied this allegation. It appeared that the skylight originally formed the sloping top of a conservatory erected by the plaintiff's father in 1873 on the northern side of the hotel, and abutting on the defendant's premises. This skylight having been in existence since 1873 was what was called an ancient light, unless the access of light thereto over the defendant's property was enjoyed by some consent or agreement expressly made by deed or in writing. On June 13, 1873, in respect of the construction of the conservatory, an agreement was entered into by the then respective owners of the property, by which the plaintiff's father agreed to pay to Isted 1s. per annum as an acknowledgment for allowing the windows in his conservatory to open on to and overlook Isted's property, and the plaintiff's father also agreed to close the same when required to do so. At any rate, down to the year 1888 the right to the access of light over the defendant's property to the plaintiff's window or skylight was enjoyed by some consent or agreement expressly made or given for the purpose by deed or in writing. It appeared to his lordship that the plaintiff had not enjoyed the access of light to the window or skylight in question for the full statutory period of twenty years, and the action must be dismissed with costs.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

20,921-2.—APPLIANCES FOR SANITARY WARE, CLOSETS, &C.: *M. J. Adams*.—A jointing for sanitary ware and metal goods, available for use in the fixing of waste or supply pipes in lavatories, and so on, consists of an indent which is fashioned around the outside of the pottery ware, and of a band of metal or some wire wrapping which is applied to the indent. The enlarged sockets are secured to the wrapping with solder or by other means. (20,922) In this contrivance, which is described as being available also for closets after the "multiple" kind for use in schools, institutions, &c., the inventor discards the customary flushing-horn and adapts in its stead a pipe which is fashioned in one piece with the basin, and is turned downwards so that it shall dip into the flushing-pipe.

20,948.—COATING OF WIRE FOR STAPLES AND SIMILAR GOODS: *G. E. Parker*.—A coating for the wire (which, it is claimed, will suffer neither damage nor removal when the coated wire is made into articles) is compounded of copal varnish, linseed oil, bone-black, and turpentine. The wire coated therewith is dried in a gas-stove or oven. The wire is extended from a reel around two pulleys, thsn beneath a pulley in the coating-bath, over a fibrous wiper, and thence to the heating chamber, from which it is coiled upon a reel.

20,976.—REMOVAL OF SOIL, STONES, &C.: *C. F. W. A. Oetling*.—The material can be cast from a shovel or fork which is worked with compressed air, steam, &c., some distance along the path of projection. In one form a rod sliding through a sleeve pivoted on to the portable framework carries the shovel or fork at its one end, while its other end is caused to move between curved guides, being linked to the end of a piston-rod in a cylinder. The cylinder may otherwise be pivoted in the frame, the shovel being then mounted upon the piston-rod. For a throw backwards the piston-rod is pivoted on to an axis, and the shovel is mounted upon the end of the cylinder that turns in curved guides. Or the shovel may be mounted upon the piston-rod, an additional cylinder being employed to swing the cylinder.

20,977.—IMPROVEMENTS IN WHEELBARROWS: *V. A. Gates and C. A. Gates*.—The sloped portions of the front and back of the barrow are taken by the bevelled sloping pieces that constitute the sides, and stiffened supports are provided. To each of the sides are attached a handle and one member of the wheel fork. The parts are bolted together when the back and front have been adjusted with the sloping sides. An extension of the back support constitutes a foot for the barrow.

20,997.—MEANS OF STORING AND PRESERVING DRAWINGS, MAPS, SKETCHES, &C.: *M. Edmondson and E. Hill*.—The appliance consists of a bar having hanging plates fitted with eyelets, and a back of cloth or similar fabric, and of another bar with a front of cloth which can be hooked on to or otherwise secured flush with the former bar. The sheets are taken by hooks, and there are adjustable holding-pieces which will move parallel-wise with the back of the former bar which holds the pieces up. When they are not required for use the hooks are to be laid parallel-wise with the bars and wrapped in the cloth covers.

21,019.—A WRENCH: *C. B. Ketchum and G. W. Schwoob*.—The inventors contrive that the handle, which is affixed to the shank with a hinge-pin, can be secured in different positions by means of spring catches that engage with notches. A pawl, which is pressed against by the teeth of a spring maintains the moveable jaw in its fixed position for gripping purposes.

21,023.—DREDGING APPARATUS: *C. Bonger*.—The object of the invention is to provide for an alternate pumping, from two boats, of the dredging-pump without a stopping of the pump; the two branches of the suction-pipe are regulated with a disc-valve, the openings which register with the two branches are placed at such a distance apart from one another that when the valve is turned one of the suction-inlets becomes partly opened before the other has been quite closed; a handle upon a middle spindle serves for an adjustment of the valve which can be locked in position with a nut and handle.

21,047.—A SAFETY APPLIANCE FOR KEYHOLES: *A. M. Young*.—Grooves or projections upon the lock-casing take a staple which protects the keyhole and can be secured in the position desired, a dovetailed recess cut in the staple engages with a slide affixed to the casing, a slit in the staple engages with a pin upon the slide so that the former shall not be withdrawn, and an engagement set up by the bolt of an auxiliary lock carried by the main lock maintains the staple in the covering position.

21,059.—ATTACHMENTS FOR ASPHALT PAVEMENT: *H. Beck*.—The inventor devises plates or slabs of asphalt, into which he inserts keys or wedges formed of earthenware, stone, or some similar material, and which are to be united, with mortar, to the foundation of concrete.

21,061.—AN ANTI-FOULING OR ANTI-CORROSIVE PAINT: *W. Ward*.—A coating for submerged surfaces is thus applied: An inner coating, compounded of lime, plaster of Paris, zinc oxide, iron oxide, resin, Stockholm tar or pitch, pine varnish or oil, and other ingredients, mixed with spirit and turpentine, and prepared with heat, is laid upon the wet surface, and will then afford a dry surface upon which a second coating is laid. The latter coat is made up of several specified anti-septical substances, to which, for wooden structures, some mineral green should be added.

21,123.—IMPROVEMENTS IN SINKS: *C. Flood*.—A pedestal that can be built into the wall by means of projections from the former, contains within it a gutter into which the sink will discharge its contents, and a cover is fitted in the side of the channel or gutter which rests against the wall.

21,139.—JOINTS AND COUPLINGS FOR PIPES: *R. A. Lowe and H. Line*.—For joining leaden or other soft-metal pipes, their ends are inserted through brass, gun-metal or similar ferrules which will serve as flanges upon the pipe ends; the parts are to be then drawn together, either directly or with a packing-ring between them, with a screwed nut.

21,189.—APPARATUS FOR REGULATING THE FLOW OF SEWAGE, &C.: *E. Dodd*.—The inventor seeks to

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afford means for automatically preventing waste of compensation water flowing into a river from a reservoir, preventing storm water from flowing in excess into a sewer, and controlling the amount of sewage that passes from one sewer into another. He places one part of the sewer in communication with a chamber between which and a larger container is a valve-gate; at the side of the second container is a weir over which the sewage pours, and so through a conduit into the other part of the sewer; and the same container is placed in communication with a smaller chamber that contains a float joined to a lever which works a pilot-valve. Flow of water, under pressure, to a second valve is regulated by the pilot-valve, which also regulates the shutting and closing of the valve-gate. The sewage in the chambers rises to move the float and so to shut the valve-gate if an excess of sewage flows over the weir, whereupon it rises in the first-named container, which has a submerged opening, into another smaller receiver, of which the overflow pipe leads into a watercourse. An inspection chamber is provided and a valve-gate is fitted between the conduit and the first-named chamber.

21,194.—FLUSHING APPARATUS: *W. E. Mason and H. E. Mason.*—An air-pipe joins an air-exhaustion nozzle in the flushing-pipe to the crown of the siphon, whilst the crown is also connected to a bent pipe in the flushing-cistern, its lower end being closed, normally, with a float-valve. With the flush air is exhausted from the crown, and the ensuing discharge from the basin will continue until the level in the basin has fallen below that of the siphon-inlet, or until the level in the flushing-cistern becomes low enough to let the float descend and so admit air into the bent pipe.

21,217.—AN ELECTRICAL CURRENT REGULATOR: *Eric Exploration Co.*—Intermittent current is supplied with longer or shorter breaks, so as to control the supply to lights, motors, heaters, and other translators. In one adaptation a set of insulated segments are carried by a disc. Upon a motor-driven shaft is another disc, having a brush which rubs the segments. Connectors are arranged upon the first-named disc in such a manner that circuit will be broken when the brush rubs one segment, and will be made when it rubs another segment, the connectors being adjusted for the connexion of some of the discs and a variation of the relative times of break and make. In another shape, a motor-driven drum is provided with contact strips, and the brush can be adjusted lengthwise.

21,243.—MEANS OF CLEANSING DUST-LADEN AIR: *L. Rössler.*—A vessel that holds a centrifugal fan with paddles partly immersed in water receives dust-laden air from a factory or workshop, the fan breaks up the dust-flakes which the paddles will moisten at the same time. The particles either drop into the water or go through a sieve, to be separated in the bends and amongst the baffles of the outlet pipe.

21,275.—APPLIANCE FOR WINDOW-FASTENERS: *F. R. Taylor.*—In this contrivance for securing window-sashes when closed or opened, and which can be applied to each side of the window, a plate having lugs is affixed to one sash with screws through the lugs and the plate, in the latter are screw-threaded holes with which a thumb or other screw will engage, the thumb being inserted through a plate upon the other sash.

21,276.—SPIGOT-AND-SOCKET JOINTS FOR PIPES: *T. Robinson.*—As an improvement of No. 7,917 of 1899, the inventor fits a flanged collar upon the outlet of a closet-basin, or any similar vessel, and adapts the collar so as to take a flanged metallic pipe. A flanged disc upon the floor sustains the collar, which, moreover, may be flanged so that it can be bolted on to a flange upon the outlet.

21,201.—TABLETS OR PANELS FOR PAINTERS' PURPOSES: *A. Rincklake.*—The tablets are made up of wire tissue or pierced plates, which are fixed between two layers, or beneath one layer, of canvas with some hardening adhesive, such as stiff rye-paste mixed with turpentine. The canvas thus secured to wire gauze has the adhesive for its coating, and when it is laid on both sides of the gauze the edge can be turned up for strengthening purposes.

21,340.—A ROAD-SCRAPING MACHINE: *E. Shield.* Shafts which slide in guiding pieces attached to the frame carry a metal clamp in which a squeegee is affixed. The squeegee is forced against the road surface by means of springs that work between forks upon a carrier and collars upon those shafts, with the lowering of the carriers by means of a pivoted lever; a quadrant and a pin upon a lever at the side serve for locking the pivoted lever in any position required. The machine, mounted upon wheels, can be drawn by manual or other power, and the squeegee can be made up of stepped parts.

21,308.—A BALL LIFT-VALVE: *A. D. Curling.*—The ball-lift valve, specified in No. 24,224 of 1897, has a split ring which is put around the ball in order that when the valve is opened the noise may be lessened. A ring screwed into the casing controls the movement upwards of the ring, which has a serrated lower edging.

21,405.—A METHOD OF DISINFECTING BUILDINGS: *J. M. Pringle.*—As a means of purifying and disinfecting air-spaces beneath the floors of buildings, a perforated earthenware or glass vessel is laid upon a flange which fits with cleats that are affixed to the floor; the disinfectant material is deposited in a bucket, for the handling of which a lid and covering-board are made for the vessel.

MEETINGS.

WEDNESDAY, APRIL 2.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Edinburgh Architectural Association.—Mr. James Millar on "The Glasgow International Exhibition of 1901," illustrated. 8 p.m.

FRIDAY, APRIL 4.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. E. Worth on "Sewerage." 7 p.m.

Institution of Mechanical Engineers.—The four papers on "The Fencing of Machinery" will be further discussed. 8 p.m.

SATURDAY, APRIL 5

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage Outfall Works, Barking. 3 p.m.

Edinburgh Architectural Association.—Visit to the Lander Technical School, Dunfermline.

Incorporated Association of Municipal and County Engineers.—Midland district meeting to be held at Birmingham.

TUESDAY, APRIL 8.

Society of Arts (Applied Art Section).—Professor Beresford Pite on "Street Architecture." 8 p.m.

WEDNESDAY, APRIL 16.

Society of Arts.—Ordinary meeting. Mr. J. Bridges Lee, M.A., on "Photographic Surveying." 8 p.m.

THURSDAY, APRIL 17.

Society of Arts (Indian Section).—Mr. Sidney Preston, A.M.Inst.C.E., on "Recent Developments in Punjab Irrigation." 4.30 p.m.

WEDNESDAY, APRIL 30.

Society of Arts.—Ordinary meeting. Mr. Edward T. Scammell on "The Timber Resources of the Australian Commonwealth." 8 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 12.—by VICTOR VAUGHAN (at Finchley).

Finchley.—Fallow Court-av., 30 plots of land, f... £1,880
Eton-av., two plots of building land, f. ... 120

March 13.—By DYER, SON, & HILTON (on Premises).

Lee.—9, Marlborough-rd., u.t. 50½ yrs., g.r. 3*l.*, p. ... 485

By W. & S. FREEMAN (Aldridge's) (on premises).

Mayfair.—7, Curzon-st., with yard, coach-houses, and stabling in rear, area 22,160 ft.; also the Red Lion p.-h. in Clarges-st., beneficial lease for 9½ yrs., y.r. 1,500*l.*, including goodwill of East & Co. ... 1,000
5 and 5A, Shepherd-st., with yard and stabling in rear, f., y.r. 80*l.*; Carrington-st., yard, stabling, and other premises, beneficial lease for two years, y.r. 275*l.* ... 29,150

March 14.—By SIM & RANDALL.

Ilford, Essex.—36, Mansfield-rd., u.t. 995 yrs., g.r. 13*l.* 13s., y.r. 50*l.* ... 515
Grosvenor-rd., f.g.r. 13*l.* 19s. 6d., reversion in 994 yrs. ... 355
Forest Gate.—299, Romford-rd. (S), u.t. 74 yrs., g.r. 5*l.* 10s., y.r. 80*l.* ... 1,120

By WHITE, DRUCE, & BROWN.

Cavendish-sq.—108, Harley-st., and 2, Devonshire Mews East, u.t. 11¼ yrs., g.r. 130*l.*, e.r. 450*l.* ... 1,700
Marylebone.—12, Circus-st. (S), f., y.r. 80*l.* ... 1,200

March 17.—BRODIE, TIMBS, & CO.

Hampstead.—West End-lane, The Cedars, and The Elms, area 1 a. 0 r. 14 p., f., p. ... 7,350
8, Strathray-gdns., u.t. 79 yrs., g.r. 20*l.*, p. ... 3,100

By FLEURET, SONS, & ADAMS.

Ipswich.—Tavern-st., the Great White Horse Hotel, f., y.r. 402*l.* 10s. to Midsummer, 1904, and 452*l.* 10s. to 1911 ... 14,500

By A. E. GREEN & CO.

Bethnal Green.—Driffield-rd., f.g.r.'s 36*l.*, reversion in 63 yrs. ... 880

By WILKINSON, SON, & WELCH (at Brighton).

Brighton.—27 to 34, Jubilee-st., with stores, stabling, &c., in rear, f., y.r. 150*l.* ... 3,200
14, Buxton-rd., f., p. ... 700
Hove, Sussex.—23 to 29 (odd), Goldstone-rd., f., y.r. 100*l.* ... 1,985

March 18.—By DAVID BURNETT & CO.

Rotherhithe.—Dilston-grove, i.g.r.'s 205*l.* 10s., u.t. 48½ yrs., g.r. 80*l.* ... 2,000
Clerkenwell. 5, Attneave-st., u.t. 13½ yrs., g.r. 10*l.*, e.r. 50*l.* ... 230
Hawley, Kent.—Mill-rd., two plots of building land, f. ... 110

By DEBENHAM, TEWSON, & CO.

St. Luke's.—50 and 52, Goswell-rd. (S), u.t. 53 yrs., g.r. 60*l.*, y.r. 270*l.* ... 3,350

By NOTLEY & CO.

Balham.—40, Nightingale-lane, area nearly 1 a., f., p. ... 3,500

By RUSHWORTH & STEVENS.

Mile End.—32 and 33, St. Peter's-rd., u.t. 28 yrs., g.r. 6*l.* 16s., y.r. 64*l.* ... 655
Thornton Heath, Surrey.—30 and 32, St. Paul's-rd., f., p. ... 775

By E. HOLSWORTH (at Wood Green).

Wood Green.—343 and 345, High-rd.; also Peel's Horticultural Works, f., e.r. 115*l.* ... 1,510
25, Truro-rd., f., e.r. 25*l.* ... 360

By GEORGE LOVEITT & SONS (at Coventry).

Coventry, Warwick.—9 and 10, Burgess (S), area 875 yds., f., p. ... 2,750

March 19.—By CRASKE & SONS.

Notting Hill.—44, Addison-rd. (S.), u.t. 40 yrs., g.r. 10*l.*, e.r. 45*l.* ... 405

By FAREBROTHER, ELLIS & CO.

Vauxhall.—Vauxhall-walk, a freehold building site, area 25,400 ft. ... £6,000
Lambeth.—Albert Embankment, f.g.r. 250*l.*, reversion in 61 yrs. ... 6,600

By FOSTER & CRANFIELD.

City of London.—6, 7, and 8, Temple-lane, u.t. 13 yrs., g.r. 105*l.*, w.r. 260*l.* 13s. ... 300
Stoke Newington.—48, Mildmay-grove, u.t. 49 yrs., g.r. 7*l.*, e.r. 50*l.* ... 430
Kingsland.—24, Tottenham-rd., u.t. 17¾ yrs., g.r. 5*l.*, y.r. 48*l.* ... 300
74, Buckingham-rd., u.t. 22½ yrs., g.r. 4*l.*, q.r. 30*l.* ... 210
Hoxton.—126, Bridport-pl. (S), u.t. 30 yrs. g.r. 6*l.* 6s., y.r. 50*l.* ... 460

By KNIGHT, FRANK, & RUTLEY.

Strand.—Villiers-st., f.g.r. 150*l.*, reversion in 40 yrs. ... 5,100

By MATCH & CO.

Pimlico.—15, 16, and 17, Hindon-st., u.t. 42½ yrs., g.r. 15*l.* 15s., w.r. 223*l.* 16s. ... 1,645
43, Hindon-st., a profit rental of 15*l.* for 18 yrs. ... 130
Brixton.—1, Branksome-rd., u.t. 65 yrs., g.r. 5*l.*, y.r. 30*l.* ... 380

By E. W. RICHARDSON & SON.

Shoreditch.—87, 89, and 91, Leonard-st., and 6, Ravey-st. (S), with workshop and stable in rear, u.t. 46 yrs., g.r. 89*l.*, y.r. 265*l.* 2s. ... 1,460
Shepherd's Bush.—22, Caxton-rd., f., y.r. 28*l.* ... 510
18, Macfarlane-rd., u.t. 72 yrs., g.r. 5*l.*, y.r. 28*l.* ... 330
4, Ellingham-rd., u.t. 75 yrs., g.r. 5*l.*, y.r. 28*l.* ... 390

By STANLEY PARKES & BROWN.

Hornsey.—89, 91, and 93, Turnpike-lane (S), u.t. 80 yrs., g.r. 30*l.*, y.r. 155*l.* ... 1,990

By RANDALL, COX, & BAKER.

Edgware, Middx.—Brockley Hill, Newlands Grange and 5 a. 1 r. 24 p., f., p. ... 1,600

By DOUGLAS YOUNG & CO.

Wimbledon.—Griffiths-rd., f.g.r.'s 34*l.* 10s., reversion in 95 yrs. ... 860
Chelsea.—29, Fernshaw-rd., u.t. 59 yrs. g.r. 10*l.*, y.r. 35*l.* ... 360
Harlesden.—23, Fortune Gate-rd., u.t. 87 yrs., g.r. 6*l.*, y.r. 32*l.* ... 275

By J. TAYLOR & SON (at Louth).

Legbourne Abbey, Lincs.—The Legbourne Abbey Estate, 109 a. 3 r. 7 p., f., p. ... 4,640

March 20.—By BRIANT & SON.

Lambeth.—41 and 43, Saville-pl., f., w.r. 78*l.* ... 735
Peckham.—38, Elm-grove, u.t. 24 yrs., g.r. 7*l.*, y.r. 40*l.* ... 250
131, Asylum-rd., f., y.r. 38*l.* ... 405

By CANE & CO.

Staplehurst, Kent.—Duckhurst Farm, 27 a. 0 r. 30 p., f., p. ... 1,300
Dolgwili, Carmarthen.—The Dolgwili Brick Works, area 3 a., u.t. 23½ yrs., y.r. 21*l.* 12s. 6d. (as a going concern) ... 5,500
Dulwich.—Dunstans-rd., &c., the Dawson's Hill Building Estate, 5 a., with two houses thereon, y.r. 34*l.*, part f. and part u.t. 97 yrs., g.r. 42*l.*, p. ... 3,460
318, Lordship-lane, u.t. 92 yrs., g.r. 7*l.* 5s., e.r. 42*l.* ... 350
213 and 215, Friern-rd., f., y.r. 78*l.* ... 1,100

By CHESTERTON & SONS.

Kensington.—95 and 97, Kensington High-st. (S), u.t. 48 yrs., g.r. 20*l.*, y.r. 1,050*l.* ... 16,300

By C. RAWLEY CROSS & CO.

Kensington.—37 and 38, Addison-rd. North, u.t. 40½ yrs., g.r. 20*l.*, y.r. 92*l.* ... 985

By HAMPTON & SONS.

Fulham.—47, Vanstone-pl. (S.), f., y.r. 65*l.* ... 2,200
637, Fulham-rd. (S.), area 10,740 ft., f. y.r. 105*l.* ... 3,200
4 to 16 (even), Jerden-pl. (S.), area 6,000 ft., c., y.r. 340*l.* 12s. ... 5,890
35 and 37, North End-rd. (including The Live and Let Live B.-H.) and 1, Portland-st., u.t. 8½ yrs., gr., 10*l.*, y.r. 102*l.* ... 475
Hammersmith.—71, Black Lion-lane, u.t. 12½ yrs., g.r. 4*l.*, y.r. 26*l.* ... 150

By W. MARTIN & CO.

Dulwich.—Calton-rd., Velindre, u.t. 80 yrs., g.r. 6*l.*, e.r. 60*l.* ... 710
22, Hillsboro'-rd., u.t. 62 yrs., g.r. 7*l.* 10s., e.r. 42*l.* ... 390

By MUSKETT & SONS.

Wood Green.—Alexandra Pk.-rd., Clovelly, f., e.r. 52*l.* ... 600
Alexandra Pk.-rd., four freehold building plots. ... 300
Bowes Park.—Marlboro'-rd., a freehold building plot ... 110
Herne Bay.—The Broadway, four freehold building plots ... 210
Salisbury Drive, six freehold building plots.... 150

By NEWBON, EDWARDS, & SHEPHARD.

Stoke Newington.—High-st., one-third share of f.g.r.'s 350*l.*, reversion in 25 yrs. ... 3,000
Norwood.—Farquhar-rd., f.g.r.'s 113*l.*, reversion in 78 yrs. ... 2,755
Balls Pond.—4, Canterbury-rd., u.t. 49½ yrs., g.r. 3*l.* 10s., y.r. 30*l.* ... 335
Hoxton.—29 to 35 (odd), Coleman-st., u.t. 25 yrs., g.r. 25*l.* 4s., y.r. 132*l.* ... 910
Caledonian-rd.—35, Freeling-st., y.r. 28*l.*; also i.g.r. 13*l.* 13s., u.t. 42½ yrs., g.r. 20*l.* ... 150
Hornsey.—99 and 101, Campsbourne-rd., u.t. 70 yrs., g.r. 14*l.* 14s., w.r. 58*l.* 10s. ... 455
Highbury.—6, Northolme-rd., u.t. 86½ yrs., g.r. 8*l.* 10s., y.r. 55*l.* ... 605
Islington.—Essex-rd. (Essex Arms b.-h., &c.), f.g.r.'s 32*l.*, reversion in 42½ yrs. ... 1,000
Holloway.—65, Parkhurst-rd., u.t. 21 yrs., g.r. 10*l.*, e.r. 77*l.* ... 470

By STIMSON & SONS.

Soho.—4, Peter-st., f., y.r. 85*l.* ... 1,050
Fulham.—61, Parsons Green-lane, area 9,800 ft., f., p. ... 1,000
Brixton.—34, Grove-rd., u.t. 22 yrs., g.r. 6*l.*, y.r. 50*l.* ... 300
Woolwich, Kent.—44, Woolwich-common, f., y.r. 30*l.* ... 550
Plumstead, Kent.—13 and 15, Plumstead Common-rd.; also Park Cottage, u.t. 27 yrs., g.r. 5*l.* 11s., w.r. 88*l.* 8s. ... 450
121 to 127 (odd), Villas-rd., u.t. 23¾ yrs, g.r. 8*l.*, w.r. 88*l.* 8s. ... 510
114 and 116, High-st. (S), f., e.r. 80*l.* (including goodwills) ... 1,000

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Doddinghurst, Essex.—Bannister's Farm, 31 a. 2 r. 36 p., f., p. ... £1,000
By Messrs. TROLLOPE.
Pimlico.—258 to 266 (even), Vauxhall Bridge-rd., f., y.r. 410*l.* ... 8,250
By J. A. & W. THARP.
Leytonstone.—42, Leyspring-rd., u.t. 77¼ yrs., g.r. 6*l.*, e.r. 32*l.* ... 310
By FULLER, MOON, & FULLER (at Croydon).
Croydon.—Church-st., site of Edwards' Tannery, area 12,000 ft., f., p. ... 1,400
49 to 57 (odd), Borough Hill, f., w.r. 91*l.* ... 1,100
March 21.—By BLAKE & CARPENTER.
Croydon.—42, Croham Pk.-avenue, u.t. 96 yrs., g.r. 12*l.* 10*s.*, e.r. 150*l.* ... 2,000
By DAVID J. CHATTELL.
Notting Hill.—Phœnix-pl., f.g.r. 22*l.*, reversion in 41 yrs. ... 690
Addison-rd. North, f.g.r.'s 18*l.*, reversion in 37 yrs. ... 755
Prince's-rd., the Prince of Wales Hotel, f.g.r. 35*l.*, reversion in 41 yrs. ... 2,000
Prince's-rd., f.g.r.'s 45*l.*, reversion in 41 yrs. ... 1,160
North Woolwich.—Albert-rd., l.g.r. 44*l.*, u.t. 30½ yrs., g.r. 18*l.* 18*s.*, with reversion ... 480
Lambeth.—Saville-pl., c.g.r. 11*l.* 5*s.*, reversion in 22½ yrs. ... 300
14, 16, and 18, Saville-pl., c., w.r. 89*l.* 14*s.* ... 610
31 to 36, Lollard-st., c., w.r. 201*l.* 10*s.* ... 1,230
31, Gundulf-st., c., w.r. 29*l.* 18*s.* ... 215
24, Distin-st. (dairy, &c.), c., y.r. 48*l.* ... 740
110 and 111, Ethelred-st., c., w.r. 02*l.* 8*s.* ... 460
33, Royal-st., c., w.r. 33*l.* 16*s.* ... 265
3, 4, 8 to 14, 17 to 22, Saunder's-st., and 4, Saunder's-ct., u.t. 6½ yrs., g.r. 4*l.* 12*s.*, w.r. 418*l.* 12*s.* ... 600
By DREW & SON.
Richmond.—27 and 29, Manor-rd., u.t. 63 yrs., g.r. 2*l.*, y.r. 58*l.* ... 595
By GREEN & SON.
South Woodford.—Chigwell-rd., Normanhurst, f., y.r. 52*l.* 10*s.* ... 775
Wapping.—35, Great Hermitage-st., area 650 ft., f., w.r. 36*l.* 8*s.* ... 380
By HIGGINS & SON.
St. John's Wood.—14, Acacia-rd., u.t. 32½ yrs., g.r. 10*l.*, e.r. 65*l.* ... 675
Regent's Park.—125, Albany-st., u.t. 13½ yrs., g.r. 15*l.*, y.r. 60*l.* ... 300
By JONES, LANG, & CO.
Southwark.—134 and 138, Southwark-st. (warehouses), f., y.r. 250*l.* ... 3,550
By SCOBELL & LAKE.
Houndsditch.—33, Harrow-alley (warehouse, &c.), u.t. 83 yrs., g.r. 35*l.*, y.r. 200*l.* ... 1,550
By A. J. SHEFFIELD.
Limehouse.—37 to 57 (odd), Northey-st., u.t. 41 yrs., g.r. 42*l.* 10*s.*, w.r. 30*l.* 12*s.* ... 1,600
Holloway.—3, Tremlett-grove, u.t. 72 yrs., g.r. 7*l.* 7*s.*, y.r. 45*l.* ... 475
By WATTS & WELLS.
Chiswick.—56, Homefield-rd., u.t. 88 yrs., g.r. 9*l.*, y.r. 45*l.* ... 555

Contractions used in these lists.—F.g.r. for freehold ground-rent; gdns. for gardens; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 11 6	per 1,000 alongside, in river.
Rough Stocks and Grizzles	1 9 6	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 5 0	,, ,, ,,
Flettons	1 8 0	,, at railway depôt.
Red Wire Cuts ..	1 12 0	,, ,, ,,
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,, ,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,, ,,
Do., Bullnose	4 10 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 5 6	,, ,, ,,
GLAZED BRICKS		
Best White and Ivory Glazed Stretchers.....	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers..	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	20 0 0	,, ,, ,,
Best Dipped Salt GlazedStretchers and Headers ..	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers..	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	14 0 0	,, ,, ,,
Seconds Quality WhiteandDipped Salt Glazed	2 0 0	,, less than best.

PRICES CURRENT (*Continued*).

BRICKS, &c.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	32 0	per ton, delivered.
Best Ground Blue Lias Lime..	25 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11*s.* 0*d.* per yard, delivered.
Stourbridge Fire-clay in sacks, 26*s.* 6*d.* per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depot.
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 3	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks ..	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup)	2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	12 0 0	per 1000 of 1200 at ry. dep.
,, best seconds ,,	11 10 0	,, ,,
16× 8 best ,,	6 15 0	,, ,,
20×10 best blue Portmadoc	11 5 0	,, ,,
16×8 best bluePortmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green....	12 2 6	,, ,,
16× 8 ,, ,,	7 5 0	,, ,,
20×10 permanent green	10 5 0	,, ,,
16×8 ,, ,,	5 17 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles..	41 6	per 1,000, at rly. depôt.
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	14 10 0	16 0 0	
Deals: best 3 by 9.....	13 10 0	15 0 0	
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	10 10	11 10 0	
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.	
Deals: seconds	1 0 0	less than best	
Battens: seconds	0 10 0	,, ,, ,,	
2 in. by 4 in. and 2 in. by 6 in. ..	8 10 0	9 10 0	
3 in. by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0 0	
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.	
½ in.	1 0 0	,,	
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Swedish balks.....	2 15 0	3 0 0	
Pitch-pine timber (30 ft.).....	3 0 0	3 10 0	
JOINERS' WOOD.	At per standard.		
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0	
3 in. by 9 in.	20 0 0	21 0 0	
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0	
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0	
,, ,, 3 in. by 9 in.	16 10 0	18 10 0	
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0	
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0	
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0	
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0	
Do. 3 in. by 9 in.	17 0 0	18 0 0	
Battens.....	13 0 0	14 0 0	
Second yellow deals, 3 in. by 11 in.....	15 0 0	16 10 0	
Do. 3 in. by 9 in.	13 10 0	14 10 0	
Battens.....	11 0 0	12 0 0	
Third yellow deals, 3 in. by 11 in.....	12 10 0	13 10 0	
Do. 3 in. by 9 in.	12 0 0	13 0 0	
Battens.....	10 0 0	11 0 0	
White Sea and Petersburg :—			
First white deals, 3 in. by 11 in.	14 0 0	15 0 0	
,, ,, 3 in. by 9 in.	13 0 0	14 0 0	
Battens.....	11 0 0	12 0 0	
Second white deals 3 in. by 11 in.	13 0 0	14 0 0	
,, ,, 3 in. by 9 in.	12 0 0	13 0 0	
,, ,, battens.....	9 10 0	10 10 0	

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.	
Pitch-pine: deals	16 0 0	18 0 0	
Under 2 in. thick extra	0 10 0	1 0 0	
Yellow Pine—First, regular sizes..	32 0 0	33 10 0	
Broads (12 in. and up).....	2 0 0	more.	
Oddments	22 0 0	24 0 0	
Seconds, regular sizes	24 10 0	26 10 0	
Yellow Pine Oddments	20 0 0	22 0 0	
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6	
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0	
Small ,, ,, ...	0 2 3	0 2 6	
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6	
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8	
¾ in. do. do.	0 0 7	- - -	
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11	
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0	
Dry Walnut, American, per ft sup. as inch	0 0 10	0 1 0	
Teak, per load	16 0 0	20 0 0	
American Whitewood Planks— Per ft. cube.....	0 3 0	0 3 6	
Prepared Flooring—	Per square.		
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6	
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6	
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0	
6 in. at 6d. per square less than 7 in.			
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6	
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6	
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6	
6 in. at 6d. per square less than 7 in.			

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars.....	8 0 0	8 10 0
Staffordshire Crown Bars, good merchant quality	8 10 0	9 0 0
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars.....	9 0 0	9 10 0
Hoop Iron, basis price.....	9 5 0	9 15 0
,, ,, galvanised.....	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.....	10 0 0	- - -
,, ,, to 24 g.....	11 0 0	- - -
,, ,, to 26 g.....	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.....	14 0 0	- - -
Sheet Iron, Galvanised, flat, best quality :— Ordinary sizes to 20 g.....	16 10 0	- - -
,, ,, 22 g. and 24 g.	17 0 0	- - -
,, ,, 26 g.....	18 10 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 10 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 0 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12 5 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 10 0	10 0 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 5 0	- - -
Pipe in coils	14 15 0	- - -
Soil Pipe.....	17 5 0	- - -
ZINC—Sheet— Vieille Montagne..... ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet..... per lb.	0 1 0	- - -
Thin ..... ,,	0 1 1½	- - -
Copper nails..... ,,	0 1 1½	- - -
BRASS— Strong Sheet..... ,,	0 0 11	- - -
Thin ,, ... ,,	0 1 1	- - -
TIN—English Ingots..... ,,	0 1 3	- - -
SOLDER—Plumbers' ..... ,,	0 0 6½	- - -
Tinmen's ..... ,,	0 0 8	- - -
Blowpipe ..... ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths.....	3d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, fourths	4d. ,, ,,

[*See also next page.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Memorial to Queen Victoria, Guildhall, York	The Committee	50*l.*	May 1
*Infectious Disease Hospital	Harrogate, &c., Jt. Isol. Hosp. Com	100*l.* and 50*l.*	June 1
*Police and Fire Brigade Buildings	County Borough of Sunderland	100*l.*, 50*l.*, and 25*l.*	Aug. 30

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Railway Stores, Manchester	L. and Y. Railway Company	R. C. Irwin, Hunt's Bank, Manchester	April 1
Water Works, near Bruton, Somerset	Wincanton R.D.C.	A. P. I. Cotterell, Civil Engineer, 28, Baldwin-street, Bristol	do.
Road Metal, &c.	Waterloo (Lancs) U.D.C.	F. S. Yates, Civil Engineer, Town Hall, Waterloo	do.
Road Works, Princess-street	Rochdale Corporation	S. S. Platt, Civil Engineer, Boro. Surveyor, Town Hall, Rochdale	do.
Sewerage Works	Longton (Staffs) Town Council	J. W. Wardle, Civil Engineer, Court House, Longton	do.
Convalescent Home, Cwmdonkin	Swansea Hospital Committee	G. Moxham, Architect, Castle-street, Swansea	do.
Fire Station	East Molesey U.D.C.	J. Stevenson, Surveyor, Council Offices, East Molesey	do.
Wood Paving Blocks (1,200,000)	Hastings Corporation	F. H. Palmer, Civil Engineer, Town Hall, Hastings	do.
Additions to Schools, Neyland	Llanstadwell, &c., School Board	D. E. Thomas, Architect, Haverfordwest	April 2
School, Bentinck	Newcastle-on-Tyne School Board	A. Goddard, Grainger-street West, Newcastle	do.
Cast Iron Pipes, &c.	Llandudno U.D.C.	E. P. Stephenson, Engineer, Town Hall, Llandudno	do.
Limestone, &c.	Pontypool R.D.C.	R. Derrett, Surveyor, Usk	do.
Stoneware Pipes, Cement, &c.	Margate Corporation	Borough Engineer, Town Hall, Margate	do.
Police Station, Seacombe, Cheshire	.....	H. Beswick, Architect, Newgate-street, Chester	do.
*Stoves and Ranges	West Ham Union	Clerk's Office, Union Workhouse, Leytonstone, N.E.	do.
*Making-up Roads	Ealing Town Council	Borough Engineer, Town Hall, Ealing, W.	April 3
Minister's House, Kineton, Warwick	.....	A. Fairfax, Banbury	do.
Broken Slag and Granite	Luton Town Council	Borough Surveyor, Town Hall, Luton	do.
Two Houses, Saville-place	Sunderland Corporation	W. & T. R. Milburn, 20, Fawcett-street, Sunderland	do.
Concert Hall, &c., Dartford	.....	H. E. Bennett, Westgate House Club, Dartford	April 4
Cottages, South Cross-street, Leadgate, Durham	Consett Iron Company, Limited	C. E. Oliver, Architect, General Offices, Consett	do.
Quenast Granite (3,000 tons)	Blything (Suffolk) R.D.C.	H. A. Mulleus, Union Offices, Bulcamp, Suffolk	do.
Minister's Residence, Sandoach	Rev. T. A. Seed	A. Price, Architect, Sandbach	do.
*Cleaning and Painting Somers Town Depot	Midland Railway Company	Company's Architect, Cavendish House, Derby	do.
Superstructure of Offices, York	North Eastern Railway Company	W. Bell, Architect, York	do.
Police, Station, &c., Helston, Cornwall	Standing Joint Committee	O. Caldwell, Architect, Victoria-square, Penzance	April 5
Road Metal, &c.	Maldon R.D.C.	Keywood & Eunals, Surveyors, Public Hall Chambers, Maldon	do.
*Repairing, &c., Public Urinals	Borough of Islington	Borough Engineer, Town Hall, Upper-street, N.	April 7
Repairs, &c., Public Gardens	do.	do.	do.
Greenhouse at Cemetery	Cockermouth Burial Board	T. C. Burn, Main-street, Cockermouth	do.
Town Hall	Macroom U.D.C.	A. W. Barnard, Civil Engineer, Council Offices, Macroom	do.
Road Works, Victoria-street	Dronfield (York) U.D.C.	T. H. Atkinson, Surveyor, Dronfield	do.
Broken Granite	Louth (Lincs) Town Council	G. H. Allison, Borough Surveyor, Town Hall, Louth	do.
Refuse Destructor, Buildings, &c.	Nantwich U.D.C.	W. F. Newey, Market-street, Nantwich	do.
New Roads, Muswell Hill	The Company	Vigers & Co., 4, Frederick's-place, Old Jewry, E.C.	April 8
Flint Road Metal	Steyning East R.D.C.	E. Cripps, Council Offices, Ham-road, Shoreham	do.
Additions to Hospital, Denton, near Gravesend	Port of London Sanitary Com.	City Surveyor, Guildhall, E.C.	do.
Bridge, Bessingby-road, Bridlington	North Eastern Railway Company	W. J. Chadworth, Engineer, Company's Offices, York	April 9
Road Making and Lighting Works	Kingston-on-Thames Corporation	Borough Surveyor, Clattern House, Kingston-on-Thames	do.
Electric Tramways	Warrington Corporation	Preece & Cardeu, Engineers, 8, Queen Anne's Gate, S.W.	do.
Bricks, Cement, &c.	Sutton Coldfield Corporation	F. W. Mager, Surveyor, Aldridge, Walsall	do.
Drainage Works, Foleshill, near Coventry	Foleshill R.D.C.	C. N. Lailey, Civil Engineer, 6, The Sanctuary, Westminster, S.W.	April 10
Chapel and Schools, Middleton-on-the-Wolds	.....	Gelder & Kitchen, Architects, 76, Lowgate, Hull	April 11
Pair of Villas, Malone-road, Belfast	Belfast District Asylum Com.	Blackwood & Jury, Architects, 41, Donegall-place, Belfast	April 12
Two Villas, Purdysburn Estate	Old Brentford School Board	Graeme-Watt & Tulloch, Architects, 77A, Victoria-street, Belfast	April 14
*Erection of Schools	.....	Nowell, Parr & A. E. Kates, Archts., 5, Brent-rd., Brentford, W.	do.
Church, Kilcoe, Ireland	Southampton County Council	M. A. Hennessy, Architect, South Mall, Cork	April 15
*Additions, &c., Aldershot Police Station	Hambledon R.D.C.	County Surveyor, The Castle, Winchester	do.
Road Materials, near Guildford	Leyton U.D.C.	G. Lintott, Surveyor, Cranleigh	April 16
*1,680 yds. of Hassall's Pipe Sewer at Leyton Marshes	Tarporley (Cheshire) U.D.C.	W. Dawson, Town Hall, Leyton	do.
Pipes Sewers (two miles)	Devonport Corporation	B. Latham, Civil Engineer, Victoria-street, Westminster, S.W.	do.
Tramway Works	Gloucester School Board	A. B. Piling, Municipal Buildings, Devonport	April 21
Infants' School	Tendring Union	H. Medland, Architect, 15, Clarence-street, Gloucester	April 22
Additions, &c., to Union Workhouse	South Shore Bowling Club	The Clerk, 42, Church-street, Harwich	No date
Pavilion, Blackpool	.....	J. W. Bulcock, Architect, 26, Dean-street, South Shore, Blackpool	do.
Additions to House, near Fyling Hall, Whitby	Northern Theatres Co., Ltd.	H. G. Walker, Architect, Skinner-street, Whitby	do.
Theatre, Halifax	Aston Magna Brick and Tile Co.	Jackson & Fox, Architects, Rawson-street, Halifax	do.
Large Drying Shed, Moreton-in-the-Marsh	.....	J. Kennedy, Estates Office, Batsford	do.
Four Houses, Spring Grove Mount, Hunslet, Leeds	Kelso District Committee	J. B. Leak, Architect, Waterloo-road, Hunslet, Leeds	do.
Hospital	.....	Mitchell & Wilson, Architects, 14, Young-street, Edinburgh	do.
Villa, Plumtree, Nottingham	.....	F. Parkin, Civil Engineer, Prudential Buildings, Nottingham	do.
Club and Institute, Rowlands Gill, Durham	.....	T. H. Stafford, Architect, South Garesfield Colliery, Lintz Green	do.
*Detached Residences, Keswick-road, Putney, S.W.	.....	Hugh Davies, Architect, 124, Holborn, E.C.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Surveyor of Highways	Bourne R.D.C.	180*l.*	April 9
*Chief Engineer and Surveyor	County Borough of Northampton.	600*l.* per annum	Mar. 16

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. & x. Public Appointments, xviii.

PRICES CURRENT (*Continued*).

ENGLISH SHEET GLASS IN CRATES.

32 oz. thirds	5½d.	per ft. delivered.
,, fourths	5d.	,, ,,
Fluted sheet, 15 oz.	3d.	,, ,,
,, 21 ,,	4d.	,, ,,
½ Hartley's Rolled Plate	2d.	,, ,,
⅝ ,, ,, ,,	2½d.	,, ,,
¼ ,, ,, ,,	2½d.	,, ,,

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	2	9
,, ,, ,, in barrels	,,	0	2	10
,, ,, ,, in drums	,,	0	3	0
Boiled ,, ,, in pipes	,,	0	2	11
,, ,, ,, in barrels	,,	0	3	0
,, ,, ,, in drums	,,	0	3	2
Turpentine, in barrels	,,	0	2	6
,, in drums	,,	0	2	8
Genuine Ground English White Lead	per ton	21	0	0
Red Lead, Dry	,,	20	10	0
Best Linseed Oil Putty	per cwt.	0	8	6
Stockholm Tar	per barrel	1	12	0

PRICES CURRENT (*Continued*).

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Elastic Copal Varnish for outside work	0	16	6
Best Elastic Copal Varnish for outside work	1	0	0
Best Elastic Carriage Varnish for outside work	0	16	0
Best Hard Oak Varnish for inside work	0	10	6
Best Extra Hard Church Oak Varnish for inside work	0	10	6
Fine Hard Copal Varnish for inside work	0	16	0
Best Hard Copal Varnish for inside work	1	0	0
Best Hard Carriage Varnish for inside work	0	16	0
Extra Pale Paper Varnish	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
Best French and Brush Polish	0	10	0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

CROYDON.—For detached house, Chatsworth-road. Mr. A. Broad, architect, 22, George-street, Croydon. Quantities by the architect:—

S. Hart	£1,997	Pearson & Co	£1,875
S. Page	1,985	E. J. Saunders	1,800
Smith & Sons	1,960	E. J. Burnand	1,790
Akers & Co.	1,937	Hanscomb & Smith	1,744
W. Potter	1,919	Smith & Son*	1,728
D. W. Barker	1,899		

CROYDON.—For house, Beech House-road. Mr. A. Broad, architect, 22, George-street, Croydon:—

W. Potter	£859	D. W. Barker*	£842

CROYDON.—For house, Temple-road. Mr. A. Broad, architect, 22, George-street, Croydon:—

J. J. Cooper	£705	Pearson & Co.*	£600
W. Potter	659		

FENNY STRATFORD.—For the construction of sewage disposal works for the Urban District Council. Mr. J. Chadwick, engineer, Bletchley, and 53, St. Margaret's-mansions, Victoria-street, London, S.W.:—

Contract No. 1.

G. Bell	£10,203 9 9
W. Manders	9,364 7 2
J. Jackson	8,508 18 4
J. and T. Binns	8,459 11 1
York Green & Co.	8,390 11 3
Lock & Andrews	8,064 16 0
J. Cunliff	7,937 11 9
C. Carden	7,904 0 8
Bower Bros.	7,675 0 0
Grounds & Newton	7,541 10 7
Siddons & Freeman*	7,050 0 0
R. L. Tonge	6,300 0 0

Contract No. 2.

J. Jackson	£7,442 9 2
York, Green & Co.	7,384 13 9
G. Bell	7,264 7 0
Bower Bros.	7,161 0 0
J. & T. Binns	7,035 12 5
W. Manders	6,735 14 3
Lock & Andrews	6,622 13 8
Siddons & Freeman	6,490 0 0
J. Cunliff	6,349 16 8
R. L. Tonge	6,320 0 0
Grounds & Newton*	6,114 14 6

Contract No. 3.

J. & T. Binns	£4,090 18 3
J. Jackson	3,848 11 5
Hughes & Lancaster	3,792 9 0
J. Cunliff	3,699 12 9
Bower Bros.	3,475 0 0
Siddons & Freeman*	3,399 0 0

LONDON.—For erecting a block of dwellings on the Queen Catherine-court area, Dorset-street, Limehouse, E., for the Metropolitan Borough of Stepney. Mr. W. Jameson, Borough Engineer:—

Holliday & Greenwood	£6,377	Dove Brothers	£5,685
Wells, Martin, & Co., Ltd.	6,315	Todd & Newman	5,678
Chessum & Sons	5,999	H. N. Holloway	5,657
H. Lovatt	5,873	C. G. Hill	5,596
B. E. Nightingale	5,765	F. G. Minter	5,587
A. Porter	5,765	Patman & Fotheringham, Ltd.	5,553
Smith & Sons, Ltd.	5,729	Sabey & Son	5,527
Wilson Brothers & Lamplough	5,693	R. & E. Evans, 8, Lisford-street, Sumner-road, Peckham, S.E.*	5,408

LONDON.—For supplying and fixing a complete electric light installation at the Public Library, Bancroft-road, Mile End, E., for the Metropolitan Borough of Stepney. Mr. W. Jameson, Borough Engineer:—

Haines & Co.	£148 18 8	Christie & Co.	£96 0 0
Barlow Bros.	127 0 0	Ward Bros., 13, Beer-lane, E.C.*	93 1 0
Tamplin & Makocski	109 17 2		
The Lighting Corpn., Ltd.	107 10 0		

LONDON.—For supplying and delivering timber for year ending March, 1903, for the Metropolitan Borough of Stepney. Mr. W. Jameson, Borough Engineer:—

J. J. & S. W. Chalk, 2½ per cent. below schedule prices.
G. E. Gray, 10 per cent. above schedule prices.
Stephings & Son, Adelina-grove, Mile End, E.* 2½ per cent. below schedule prices.
J. Ponler & Son, 7½ per cent. above schedule prices.

LONDON. For supplying and delivering bricks, lime, and fire clay, for year ending March, 1903, for the Metropolitan Borough of Stepney. Mr. M. W. Jameson, Borough Engineer:—

	Bricks. Staff.	Bricks. Fletton.	Bricks. Stocks.	Bricks. Fire. Sq.	Bricks. Fire. Arch.	Lime. Grey Stone.	Lime. Chalk	Per Ton Fire Clay.
	—	—	—	—	—	—	—	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	s. d.	£ s. d.
Assoc. P. C. Manufacturers, Ltd.	—	—	2 2 c	—	—	11 6	11 6	—
Byford & Sons, Moody Wharf, Poplar. E*	2 14 0	1 9 c	2 0 c	3 17 6	3 17 6	11 3	11 3	0 19 6
Erith, Lisney, & Co. {9 in. by 4½ in. by 2⅝ in. / 9 in. by 4½ in. by 3 in.}	3 0 0 / 3 5 c	1 15 c	2 0 c	4 10 0	4 10 0	12 6	12 6	1 10 0
J. Gibbs, Jun.	3 9 0	1 15 c	2 1 c	2 19 0	4 12 6	12 6	12 6	1 11 6
Harper & Moores, Ltd.	—	—	—	4 3 6	4 3 6	—	—	1 4 0
W. T. Lamb	—	—	—	—	—	10 c	10 0	—
Passmore & Co.	3 2 6	1 11 c	1 17 c	3 10 0	3 15 0	11 0	11 0	1 0 0
Rosher & Co.	4 15 0	1 15 c	2 0 c	4 15 0	5 0 0	12 0	12 0	1 10 0
Sankey & Son	2 19 0	1 12 c	1 18 c	3 19 c / 3 14 c	3 19 0	11 6	11 6	1 3 0
Tibbington Brick Works, Ltd.	—	—	—	3 15 0	3 15 0	—	—	1 4 9
Wakeley Bros. & Co.	—	1 12 c	1 18 c	4 5 0	—	10 10	10 10	1 5 0
Bray & Co.	—	1 14 c	—	—	—	—	—	—
H. Goodman	3 7 0	1 12 c	1 19 c	4 5 0	4 5 0	11 9	11 9	1 5 0

LONDON.—For granite paving for the Metropolitan Borough of Stepney. Mr. M. W. Jameson, Borough Engineer:—

	G. J. Anderson.	J. C. Base.	Wm. Gibbs, Ltd.	W. Griffiths, & Co., Ltd.*	W. Moon.
TURNER-STREET.	s. d.	s. d.	s. d.	s. d.	£ s. d.
Excavate, screen, and cart away, at per yard cube	4 6	5 0	4 6	4 6	0 11 1
Concrete (screened granite ballast and Portland cement) at per yard cubic	11 0	12 6	12 0	11 0	1 2 0
Concrete (ballast and Portland cement) at per yard cube	13 9	15 0	14 0	14 0	1 5 6
Pave with old granite sets, at per yard super	2 6	2 9	3 0	2 6	0 9 9
Square, dress, and ditto, at per yard super	4 5	4 7	5 0	4 5	0 4 8
Make, square, dress, and ditto, at per yard super	4 11	5 2	5 6	4 11	0 5 10
JUBILEE-STREET.					
Excavate, screen and cart away, at per yard cube	4 6	5 0	4 6	4 6	0 11 1
Concrete (screened granite ballast, and Portland cement) at per yard cube	11 0	12 6	12 0	11 0	1 2 0
Concrete (ballast and Portland cement) at per yard cube	13 9	15 0	14 0	14 0	1 5 6
Pave with old granite sets, at per yard super	2 6	2 9	3 0	2 6	0 9 9
Square, dress, and ditto, at per yard super	4 5	4 7	5 0	4 5	0 4 8
Make, square, dress, and ditto, at per yard super	4 11	5 2	5 6	4 11	0 5 10

LONDON.—For supplying and delivering Portland cement for year ending March, 1903, for the Metropolitan Borough of Stepney. Mr. W. Jameson, Borough Engineer:—

	Duke Shore Wharf.	Riga Wharf.	Railway Station.
	£ s. d.	£ s. d.	£ s. d.
Assoc. P.C. Manufacturers, Ltd.	1 6 11	1 7 8	1 9 3
Barton & Co.	1 6 6	1 8 6	—
Byford & Sons, Moody Wharf, Poplar, E.‡	1 5 5	1 6 2	1 8 3
Coles, Shadbolt, & Co.	1 8 7	1 8 0	1 11 0
Erith, Lisney, & Co.	1 10 0	1 10 9	1 11 6
W. T. Lamb	—	—	1 9 0 van load.
Passmore & Co.	1 7 6	1 8 3	1 9 0
Rosher & Co.	1 8 5	1 10 2	1 12 6
Sankey & Son	1 6 3	1 6 9	—
Wakeley Bros.	1 5 4	—	—
Wm. Gibbs, Ltd.	1 7 0	—	—
Goodman	1 7 9	1 8 9	1 9 0

‡ Anywhere in borough, £1 8s. 11d.

LONDON.—For supplying and delivering drainage materials for year ending March, 1903, for the Metropolitan Borough of Stepney. Mr. W. Jameson, Borough Engineer:—

	Percentage below schedule prices.	Discount.
Albion Clay Co., Ltd.	40 per cent.	2½ per cent.
Byford & Sons	40 per cent.	2½ per cent.
Doulton & Co.	32½ per cent. for best London stoneware. 40 per cent. for best Staffordshire stoneware	2½ per cent. off monthly payments
Erith, Lisney, & Co., 459, Old Ford-road, Bow, E.*	45 per cent.	2½ per cent.
Passmore & Co.	42½ per cent.	—
Sankey & Son	40 per cent.	2½ per cent.
Stiff & Son	40 per cent.	2½ per cent.
Sutton & Co.	40 per cent.	2½ per cent.
J. Gibbs, jun.	30 per cent.	—
Cliff & Son	—	Informal

LONDON.—For supplying and delivering cast iron gully grates, &c., for year ending March, 1903, for the Metropolitan Borough of Stepney. Mr. W. Jameson, Borough Engineer:—

	Per cent.
Carlton Iron Foundry, 25, Leatherdale-st., Mile End, E.*	22½‡
C. & W. Gill	5‡
W. Harris	5‡
Northamptonshire Direct Castings Co.	10§
Pontifex & Co.	24‡
Warner, Ltd.	15‡
E. & F. Wright	18½‡

‡ Below schedule. § Above schedule.

LONDON.—For supplying and delivering colours, varnishes, &c., for the year ending March, 1903, for the Borough of Stepney. Mr. W. Jameson, Borough Engineer:—

E. R. Goodrich	25 per cent. below schedule.
Haines & Co.	17½ ,, ,,
Middleton Bros.	22½ ,, ,,
Miles & Ginn, 43, Mile End-road, E.*	25 ,, ,,
R. D. Stewart	25 ,, ,,

LONDON.—For asphalte paving at Bancroft-road, Old Church-road, and any other new asphalte paving or reinstating the Council may order before Lady Day, 1903, for the Metropolitan Borough of Stepney. Mr. W. Jameson, Borough Engineer:—

	French Asphalte Co., Ltd.*	Limmer Asphalte Co.	Val de Travers Co.
	s. d.	s. d.	s. d.
New Paving.		At per load.	
Take up pitchings, cart to depot	2 6	3 0	2 6
		At per yard cube.	
Break up macadam, screen and cart earth to shoot	6 0	7 0	6 6
Excavate ground and cart to shoot	6 0	7 0	6 6
Concrete (screened granite, ballast, and Portland cement) brought up to receive paving	15 0	18 0	15 6
Concrete (ballast and Portland cement) and as No. 4	18 0	18 0	18 0
		At per yard super.	
Compressed asphalte 2 in. thick	9 10	10 6	10 0
Ditto 1½ ,,	7 9	8 6	8 0
Ditto 1 ,,	5 0	5 9	5 6
Mastic asphalte 1 ,,	5 0	6 0	5 6
Ditto ¾ ,,	4 6	5 0	4 9
Ditto ½ ,,	4 0	4 0	4 0
Repairing Existing Paving.		At per yard super.	
Break up asphalte and cart away	—	0 3	0 2
		At per yard cube.	
Ditto, and concrete thereunder, and ditto	6 0	7 0	6 6
Excavate ground and cart to shoot	6 0	7 0	6 6
Concrete (screened granite, ballast and Portland cement) brought up to receive paving	18 0	18 0	18 0
Concrete (ballast and Portland cement) and as No. 15	18 0	18 0	18 0
		At per yard super.	
Compressed asphalte 2 in. thick	12 0	13 0	12 6
Ditto 1½ ,,	10 0	10 6	10 6
Ditto 1 ,,	6 0	7 0	6 0
Mastic asphalte 1 ,,	6 0	6 9	6 0
Ditto ¾ ,,	5 3	6 0	5 6
Ditto ½ ,,	4 9	5 0	5 0

[See also next page.

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LONDON.—For alterations at Holloway Police Station. Mr. Dixon Butler, architect :—

Credit. £		£
10	C. Ansell	2,929
.....	Grover & Son	3,120
.....	Clark & Bracey	3,198
10	J. Parker	3,200
10	Lathey Bros.	3,239
.....	F. & H. F. Higgs	3,242
.....	Holloway Bros.	3,246
.....	Lascelles & Co.	3,269
10	Higgs & Hill	3,284
100	Allen & Son	3,296
.....	Willmott & Sons	3,491

LONDON.—For new parsonage house, Sbort-street, New-cut, Southwark, for the Rev. G. Robinson Lees. Mr. Ernest E. Fetch, architect, 20, John-street, Adelphi, W.C. Quantities by Mr. J. Jellis :—

H. S. Lee	£1,804 8 6	Burman & Sons	£1,611 0 0
C. Cole	1,792 11 10	Luewin Bros. & Co.	1,603 0 0
Clarke & Manooch	1,753 0 0	Jerrard & Sons	1,524 0 0
Gregar & Son	1,685 0 0	J. W. Jerram	1,444 0 0
Godson & Sons	1,685 0 0		
Adamson & Sons	1,653 0 0		

LONDON.—For the supply of 1,000,000 stoneware ducts required for the electrical cables in connexion with the reconstruction, for electrical traction, of the London County Council Tramways :—

	Rate per 1,000 ducats. £ s. d.	Amount of tender. £ s. d.
Hotea, Tugby, & Co., Ltd.	41 13 2	41,666 13 4
Sharp, Jones, & Co.	37 10 0	37,500 0 0
Hamblet's Blue Brick Co., Ltd.	36 9 2	36,458 0 0
Albion Clay Co., Ltd.	35 0 0	35,000 0 0
Leeds Fireclay Co., Ltd. (W. Ingham & Sons, Ltd., branch)	32 0 0	32,000 0 0
Oates & Green, Ltd.	32 0 0	32,000 0 0
Place & Sons, Ltd.	28 2 6	28,125 0 0
Geo. Jennings, Ltd.	25 9 0	25,000 0 0
Leeds Fireclay Co., Ltd. (E. Brooke & Sons' branch)	25 0 0	25,000 0 0
Stiff & Sons	21 0 0	21,000 0 0
Ensor & Co., Ltd.	20 0 0	20,000 0 0
Ashgrove Brick, Tile, and Fireclay Co.	20 0 0	20,000 0 0
Boothorpe Pipe Co.	19 0 0	19,000 0 0
Wragg & Sons, Ltd.	18 7 6	18,375 0 0
Sutton & Co.	18 7 6	18,375 0 0
H. R. Mansfield, Burton-on-Trent*	11 5 0	18,250 0 0
Skey & Co., Ltd., Tamworth*	18 5 0	18,250 0 0
Stanley Bros., Ltd., Nuneaton*	18 5 0	9,125 0 0

For 500,000 only.

[It was agreed at the meeting of the L.C.C. on Tuesday that the respective tenders (*a*) of Messrs. G. Skey & Co., Ltd., for the supply, in connexion with the reconstruction of the London County Council Tramways, of 500,000 stoneware ducts for the sum of 9,125*l.*, and (*b* and *c*) of Messrs. Stanley Bros., Ltd., and Mr. H. R. Mansfield, each for the supply of 250,000 ducts for the sum of 4,562*l.* 10*s.*, be accepted.]

LONDON.—For repainting Barking-road bridge, for he London County Council :—

Vigor & Co.	£856 3 9	W. Dudley	£584 19 10½
A. H. Inns	629 19 4	E. Proctor*	486 11 6

LONDON.—For the erection of five shops with dwelling-house over, and conversion of four existing houses and shops, at Grove-road, Mile End, for Messrs. Cohen & Berkovsky. Messrs. H. S. and C. A. Legg, architects, 13, Grafton-street, Mile End. Quantities by Mr. W. Hawker :—

F. & F. J. Wood	£4,350 0 0	Kendall	£3,924 0 0
Jackson	4,010 10 9	Yales	3,320 0 0
J. & H. Cocks	3,961 0 0	Barker	3,175 0 0

LONDON.—For the supply, delivery, and erection of a ten-ton overhead traveller at the pumping station which is at present in course of erection at Lots-road, Chelsea, for the London County Council :—

Broadbent & Sons, Ltd.	£650	Henderson & Co.*	£426
Whitley & Co.	504	Jessop & Appleby Bros., Ltd.	420
Booth & Bros., Ltd.	495	Carrick & Ritchie	395
Carrick & Sons, Ltd.	494	Hitchen & Son	390
Larmuth & Co.	465		
Ransomes & Rapier, Ltd.	462		

SAXHAM.—For addition to Saxham Hall, Suffolk, for Mr. C. Morbey. Mr. Jno. Flatman, architect, Newmarket :—

F. Tooke	£4,300 !	H. Plummer	£2,345
Shillitoe & Son	2,685	Wm. Saint	2,331
A. J. Bateman	2,600	H. J. Linzell*	2,129 !
J. G. Cowell	2,420		

WOKING.—For the erection of three shops, Goldsworth-road, Woking, for Mr. S. C. Knight. Messrs. W. G. Jones & Clinton, architects and surveyors, 3, Broadway, Woking, Surrey :—

F. Aylott	£3,600	Ingram & Son	£3,100
Drowley & Co.	3,539	Harris & Son	3,025
W. R. Roake	3,475	Gale & Son	2,996
F. Kemp	3,439	G. Allard, Woking*	2,750

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VOL. LXXXII.—No. 3087. APRIL 5, 1902.

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Italian Hospital, London: Staircase and Chapel ..... Mr. T. W. Cutler, F.R.I.B.A., architect.
New Offices, Aldersgate-street ..... Mr. G. L. Crickmay, F.R.I.B.A., architect.
"Oakfield," Chester ..... Mr. H. Beswick, architect.
Nos. 6, 8, 10, Wigmore-street, London ..... Mr. F. M. Elgood, A.R.I.B.A., architect.

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The Education Bill.

WE have in this journal over and over again insisted, when discussing the system of technical education, that it must be regarded as a portion of the general educational system of the country, and that it was useless to spend money on technical education unless there existed a basis in the shape of an efficient system of primary and secondary education. This argument was very clearly stated by Mr. Balfour when he introduced the Government Education Bill shortly before the Easter recess; and it is to be hoped, though we may doubt it, that the country will at length realise this cardinal point. Mr. Balfour, however, to some extent made the occasion an excuse for introducing a Bill which dealt with primary, secondary and technical education. It does not, however, follow that by jumbling all these three parts of the educational system of the country we are most likely to get the efficient general system which is the desire of all sound educational reformers. The measure rather, indeed, reminds us of the "Tacking Bills" in the time of Queen Anne, when it was endeavoured, by fastening some controversial measure to a Money Bill, to force it through the House of Lords. There is, as regards secondary and technical education, a pretty general agreement, and the Government evidently hope to take advantage of this feeling, and by tacking their legislation in regard to primary schools on to that relating to secondary and technical education, to pull it through Parliament. The radical fault of the measure lies in the neglect of the fact that while there now exists what must be regarded as a fair universal system of primary education—capable, no doubt, of improvement both in regard to teaching and to financial and general management—there is as yet no proper and general system of secondary and technical education, and absolutely no government system at all for training teachers in primary schools. It would, we think, have been far more politic and statesmanlike if the Government had been satisfied during the present session to establish something like a national system of secondary and technical education, and, having constituted the authorities for this purpose and allowed them to get into working order, to have made use of them at a later period, another session or two hence, for the purposes of primary education.

Last year, when the Government Education Bill was introduced, we referred to some of its leading features. As regards secondary and technical education they are pretty much the same, broadly speaking. In counties and county boroughs the county or the borough council was to be the educational authority for the purpose of secondary and technical education. A council, whether of a county or a borough, will have, as it has now, the right to employ the Government grant, for the purpose of these two systems; but this use is optional only, and it should certainly be made compulsory. A council, also, cannot levy a rate of more than twopence in the pound, which is admittedly too low, but which maximum is evidently placed in the Bill in order to placate the anti-educationalists who think it is waste of money to spend money on education. A council may, however, apply for a Provisional Order to enable it to levy a higher rate; but this is a ridiculous proposition, since if a county or borough council is fit to be trusted with secondary and technical education, it certainly ought to have full power to raise the necessary funds. Nothing can be more absurd than that an influential and able county council, such as that of Yorkshire (for instance), if it desires to raise an additional twopenny rate, should actually have to get the sanction of a Government department by a tedious process for this purpose.

One of the great needs in regard both of secondary and technical education is the want in various districts of higher grade and technical schools, and there appears to be no provision in the Bill by which the Local Authority will be able to raise the large funds which may be necessary for building such institutions. It is perfectly clear that the ideal national system of education should be a vast series of primary schools in urban and rural districts; then a lesser number of secondary schools, round each of which, as it were, a larger number of primary schools would be grouped, and in addition a number of technical institutions; so that a pupil could start in the primary school and obtain the beginning of a general education; then, if he had the ability, advance to the secondary school, so as to obtain a higher general education; and then enter a technical institute for the purpose of learning some particular branch of trade. It is to such a systematic course of education in Germany and the United States that the capacity of the mechanic of those countries, or, indeed, of the ordinary clerk, to enter upon new ways of work, is due, rather than to any individual superiority of mental power. It has also to be observed that these Local Authorities in county or borough are to be empowered to co-opt outside persons to serve on Education Committees. We are not sure that this is advantageous, for there appears to be no reason why a person who is interested in education should not offer himself as a candidate for a Council with a view to acting on the Education Committee; it is rather doubtful whether outsiders who are not responsible to a constituency will be found to pay the same attention to the business as those who are elected directly by the ratepayers; and we should prefer to see educational outsiders placed on the Board of Management of secondary and technical schools, rather than forming parts of what may be called the representative governing body.

It is in secondary and technical education, rather than primary, that the readers of this journal are interested, and we have now pointed out the general plan of the measure and its defects in regard to higher education. The subject of primary education, unfortunately, can hardly be touched on without wounding the religious susceptibilities which are aroused by the mere mention of board and voluntary schools. So far as the present Bill is concerned it is sufficient to say that an option is given by it to the local authority (County

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or Borough Council) which has the charge of secondary and technical education, to take over primary education. That in many rural districts the school board area is too small cannot be doubted, but in place both of school board system and the voluntary system, a true educational reformer desires to see some kind of representative body which has power over a considerable area to regulate the secular primary education of the district; but then, unfortunately, comes in the conflict between the old system of voluntary education chiefly conducted by the clergy, (which in its day, no doubt, has done great service), and the new system which is known as the Board system of secular and undenominational religious education. We do not think that the Government Bill contains the best system for reforming the primary education of England which can be devised, and from the point of view of the real interests of national education it would be desirable to leave the primary education for the present in the hands of the present authorities, until the new system of secondary and technical education has not only been established, but got into thorough working order, unhampered by the financial restrictions stated in the Education Bill, which, if they remain unaltered, must be a serious barrier to the fulfilment of a really national system.

ANCIENT CIRCULAR CHURCHES.

THE circular churches of antiquity seem hardly to have been studied as a special class of buildings, notwithstanding the immense mass of ecclesiological literature existing in the world. The present contribution to the history of this curious subject consists of notes made in visiting the buildings here described, together with extracts from such works as incidentally refer to the matter or serve to throw some light upon it.

Circular churches, which may be found all over the provinces of ancient Christendom, have evidently a close relationship, by descent, with the similar edifices built as temples of the older religions, or as tombs; and possibly the form dates back to a prehistoric period. But in the earlier religions of the world, a certain meaning or sentiment seems to have attached to a circular plan for such buildings, which survived in mediæval Christianity long after its origin had been forgotten. The prehistoric stone-circles of the world are supposed to have constituted temples, and if such was the case the circular form presumably refers to sun or fire worship. In the most ancient of civilisations—Egyptian, Assyrian, Jewish—the square plan was perhaps exclusively adopted.

In Greece the earliest circular buildings of any architectural importance and character are to be found. The Tholus, or round monument, surrounded by a peristyle, and the Prytaneum, which existed in every important Greek city, are examples. This latter contained an ever-burning fire, sacred to Vesta (the Greek *Hestia*). A holy fire continually burning was to be found in other Greek temples as well as in the Prytanea, and ever-burning lamps were also common in such buildings.

Greek Choragic Monuments, often in the form of small circular temples, were dedicated to the gods, but they do not seem to have possessed a sacred character.

Circular buildings were used by the Etruscans, chiefly as tombs—such, for instance, as the lower chamber of the famous Mamertine Prison in the Roman Forum—and in Italy we find the circular form of building carried on as a characteristic of the peninsula throughout all ages. The Temple of Vesta is one of the most ancient of the traditionally always circular buildings in existence, and the plan is therefore probably Etruscan, and from an origin closely related to that of the Greek Prytaneum. Circular temples, whether Greek or Roman, were never built over an *adytum*, or chamber of mysteries, like the ordinary square temples.

Fragments of an early (first century A.D.) Roman circular temple exist in front of the east façade of the Parthenon at Athens; it is said to have been dedicated to the goddess Roma and the Emperor Augustus.

The Temple of Vesta in the Roman Forum (the "Sainte Chapelle" of the Roman Kingdom, Republic, and Empire) was probably looked upon as the model for all similar temples and monuments. With the decline of the Empire, and the decay of art, little more than its circular form survived its various rebuildings. It was rebuilt in A.D. 191, and continued to be occupied and used for its original purpose for two centuries after that date, in spite of the public recognition of Christianity. After the entry of Theodosius into Rome (A.D. 395) the temple was closed, and the sisterhood of the Vestals was abolished. In the modern excavations of the Forum very few fragments of this tempie have been found, although it survived in a fairly intact state until 1489; in 1549 it appears to have been completely destroyed.

Many examples of circular temples still survive, and a still larger number has probably perished; of many of these latter we still have traditions. For instance, the Baptistry of Florence is said to be built out of or to occupy the site of an ancient circular temple, and a church in Pisa (St. Michele in Borgo) is supposed to have another such building forming part of its crypt. In the Levant a very interesting example still stands within a short distance of the great temples of Baalbek, in a fairly well-preserved condition, and the Cathedral of Spalato, Dalmatia, is formed out of a circular temple in Diocletian's palace.

The greatest of all the Roman circular temples, and one of the grandest monuments in the world, is without question the Pantheon of Rome, the model of so many of the masterpieces of subsequent ages and differing schools of art. There is now very little doubt this mightiest of temples was built in the reign of Hadrian in A.D. 125. The symbols and insignia of various kinds appertaining to the ancient sacrifices and priesthood on the imposts of the principal doorway appear to be in their original positions (see also Lanciani in "Notizie degli Scavi," 1881). The circular portion of the Pantheon was probably added to the splendid portico of an earlier square temple, which possibly was the only portion completed or preserved. The brickwork of the Pantheon bears the stamp of Hadrian, but the great rotunda, as we now see it, would probably not have been in a finished state until the middle of the second century. At this period the colossal brickwork and concrete style of building of the Romans was in its fullest development. The baths of Caracalla and many of the greater aqueducts belong to this period. In a stony country the Romans employed the same colossal proportions, although in a different material, at Baalbek.

Round about Rome are many monuments of this grandest period of ancient art, and it would be interesting to discover how many of the circular buildings, which are numerous, may have served at this early period as Christian churches, or even been built for the purpose. Mr. Cutts, in his "Turning-points in Church History," states "It is an historical fact there were twenty-five public churches in Rome and fifteen suburban Basilicas connected with the different catacombs before the Diocletian persecution in 303." It is also recognised that the cemeteries of Christians during the first centuries, in the neighbourhood of the catacombs, but not necessarily underground, were studded with buildings and memorial chapels. These cemeteries were used, according to innumerable traditions, as temples and places of prayer, where bishops presided, preached, and administered the Sacraments. It is clear that such usages could not be carried on within the minute chapels of the catacombs; and, in fact, the Roman catacombs have never furnished any satisfactory evidences of early church arrangements.

In buildings of this early age it is difficult to distinguish between the memorial chapel or tomb-house and the temple or church. The "church building," as we understand it at the present day, develops from the "cathedral" of a bishop. The memorial chapel was intended to contain the tomb of a Christian hero, and was used for occasional rites, but the custom of celebrating the Eucharist on the tomb within a sepulchral chapel is probably not older than the third century.

Ancient Roman sepulchres, which are often of circular plan, may have furnished models for circular memorial churches. But these ancient sepulchres are usually quite solid, or with merely a very small chamber in the interior. Roman tombs in the Levant have also exceedingly small chambers within them.

It is not until the fourth century that examples occur of regular circular churches, the dates and character of which are ascertained. But although it may be difficult to identify the earliest churches of the Christians before the recognition of Christianity by Constantine, it seems probable that certain ancient buildings about to be described may belong to this period, and may even have been built for the use of Christians.

The circular building known as the "Tempio delle Tosse" at Tivoli is now generally regarded as having been built for a Christian church. It stands within the precincts of the ancient Villa Mecenate, and is supposed to have been erected for the community of Christian slaves attached to the Villa. It is known that the slaves employed within the great villa estates were permitted to erect, or make use of, buildings for their own rites, and the examples now under consideration were all probably of this character.

The "Torre dei Schiavi" (towers of the slaves), stand within the precincts of the Villa Gordiani, just outside the Porta Maggiore, Rome. One of these remarkable

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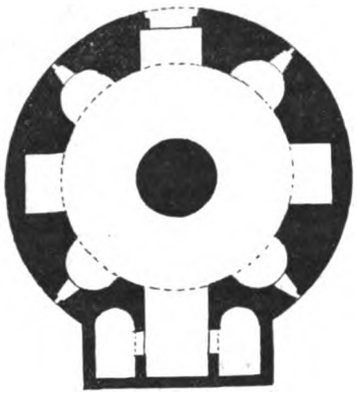


Fig. 1.

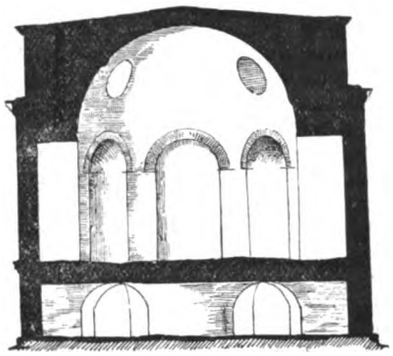


Fig. 3.

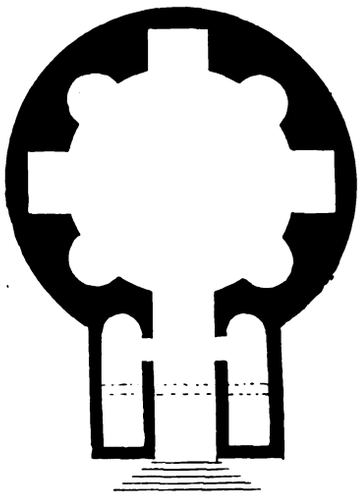
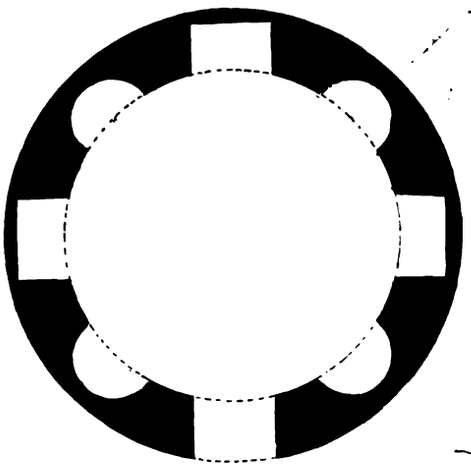
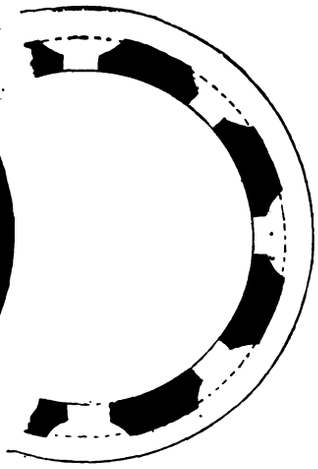


Fig. 2.



Lower Story.

Fig. 5.



Upper Story.

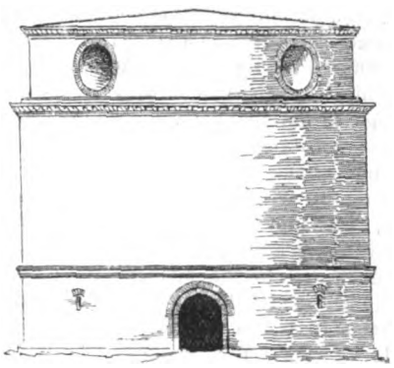


Fig 4.

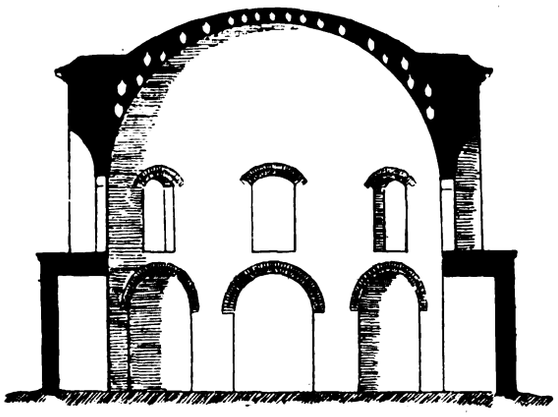


Fig. 6.

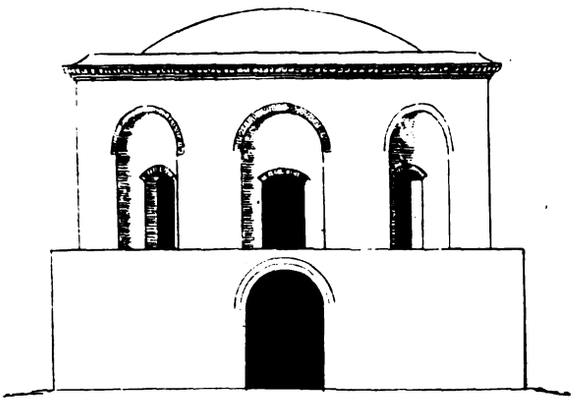


Fig. 7.

edifices may possibly be the church dedicated to St. Andrew, which is mentioned as existing on this site at a very early period. Both the so-called towers appear to belong to the type of building we are now considering. They may be described as in the Pantheon style of construction, of brick walls with concrete domes and filling in; their architectural features are of the simplest description wherever they occur. Records, traditional or historical, of these early buildings are absolutely wanting, so we can only judge by comparison with the Pantheon that they belong to the second century. Both the "Torre" are very much ruined; the fragment of the circular wall, which is all that now remains of one of them, still retains one of the large square niches which are characteristic of this style of building, and in the soffite of the niche are remains of stucco decorations in the style of the Roman Empire.

Of the less ruined of the two "Torre dei Schiavi" we are able to give plans (figs. 1-2), a section, and an elevation (figs. 3-4). The traces of use as a church remain in this building in the form of frescoes representing a row of saints, life size, which stand in a circular manner around the base of the dome. These paintings, although sufficiently clear to be identified as resembling the earliest catacomb paintings, are too much decayed to allow of a precise judgment being expressed on their date. The building may have been restored at a later period, but of this there is no evidence, nor is there any record of its destruction. The memory of a church dedicated to St. Andrew still lingers on the site, but no actual identification is possible after so many centuries of oblivion. The vicissitudes which these buildings, erected probably by the liberality of the Gordian family of Emperors, may have passed through in the lapse of ages, must for ever remain unknown. Being outside the city wall, exposed to all the ravages of barbarian sieges, and probably converted at times into fortresses for the use of the various parties in the eternal strife and bloodshed of the Early and Middle Ages, these massive walls have assumed the usual appearance of the great Roman ruins. As has been said, there are fragments of stucco decoration remaining in a niche of the most ruined of the two buildings, but the neighbouring church, although better preserved as a whole, has lost every trace of plastering and internal decoration, with the exception of the very faded frescoes in the dome. The lower story has probably been in use as a shepherds' refuge for untold centuries.

The "Tor Pignaterra," or Mausoleum of St. Helena (figs. 5, 6, 7), is situated within a few minutes' walk of the "Torre dei Schiavi," but on a different branch of the great highway which passes out of Rome by the Porta

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Maggiore. There is no doubt about this having been one of the very earliest of Christian churches. Tradition makes it the mortuary chapel built by the Empress Helena for herself, but never used for its intended purpose owing to the Empress's death taking place in the Levant. A huge sarcophagus which once decorated it, now removed to the Vatican galleries, is supposed to have been ordered by the Empress for the purpose. As a matter of fact, there is no evidence for these legends, and it is not perfectly certain that Helena was even a Christian. One of the earliest records of this church occurs in the "Liber Pontificalis," a somewhat apocryphal production of unknown but early date. According to this authority, the interior was furnished with the usual splendour of the early Christian style. Its altar (or, perhaps, altar-front) is described as of silver, weighing 200 lbs. The lamps and candlesticks, &c., of silver-gilt, are enumerated, and its general effect, as a whole, must have been sufficiently imposing. According to Ciampini (who gives some very erroneous drawings of the building), the church was surrounded by enclosing walls, of which no traces now remain.

Apparently, within the precincts of this church, perhaps within the walls above referred to, was a basilica (probably of later date) dedicated to the martyrs, Peter and Marcellinus, whose bodies were found in the catacomb which runs underneath the rotunda of the "Tor Pignaterra." This basilica was richly endowed with church furniture, and lands in Italy and Sardinia; but in after ages this church was removed to within the walls of Rome, and it is represented at the present day by a baroque building not far from S. John Lateran.

At some unknown period the "Tor Pignaterra" fell into complete ruin, the ingeniously constructed dome, built of brick, concrete, and large jars, from which latter the whole building takes its name (see section, fig. 6), fell in, and but a very small portion survives to give an idea of its original construction. This dome seems to combine the principles of construction of the older, or Pantheon style, with that which was to be carried to perfection in the domes of Ravenna and Constantinople.

The ruin of this building, which must have occurred at a date beyond any extant records, occasioned the disappearance of some substructures in the catacomb which passes underneath. There is an entrance to the catacomb in one of the great niches near the original entrance to the church, as shown on the plan, but this stairway is probably quite modern, and of the same date as the little modern chapel and curate's house built within the ruins. The present curé who lives in the house states that some years ago, when repairs were being executed in his chapel, a very large subterranean chamber was discovered underneath, probably at one time communicating with the catacomb, and of unknown size and depth, as it was unfortunately not explored at the time. This accidentally-discovered chamber, which suggests a crypt similar to that in the church of the "Torre dei Schiavi," is now inaccessible.

At one side of the church of SS. Cosmo e Damiano in the Roman Forum (the ancient Templum Urbis) is a circular building said to have been built by Maxentius to the memory of his son Romulus. This would date from the beginning of the fourth century. It resembles the above-mentioned circular buildings outside Rome in style of construction. On the opposite side of the Forum stands the ancient circular church of S. Toto, or Teodoro, also in the same style and probably of the same age. Of this latter there is no recorded mention before the year 795, when it was either rebuilt or restored by Pope Leo III. This Pope, who crowned Charlemagne, is also credited with building a circular church of S. Andrew within the city. All these buildings mentioned above are of the usual thin Roman brickwork, with wide mortar-joints (bricks and joints usually the same thickness), with circular arches exactly in the same style as the Pantheon, with brick and concrete domes, and small cornices constructed of brick, with small marble consoles. The bricks in the arches are on an average 2 ft. by 1 ft. by 1½ in.; the walling bricks are sometimes smaller. The walls were, of course, intended to be decorated with marble veneer and plastering in the usual fashion of Roman buildings.* G. J.

* To be continued.

NOTES.

Pile Driving. ATTEMPTS are made from time to time to establish a mathematical basis for the art of pile driving, invariably with indifferent success. The utmost that can be accomplished in the desired direction is the evolution of an empirical rule, vaguely expressing the results of practical experience. But even then the rule cannot be used except with considerable reservation. The fact is that while the practice of pile driving has attained a high degree of development, the theory is not yet established. Engineers are agreed that timber piles of, say, 10-15 in. diameter, driven to a practical refusal, give satisfactory results, but it is not quite certain how many should be driven in any given area. As a rule, the desire to obtain continuity of bearing results in the spacing of piles so closely together that their supporting power greatly exceeds the weight to be carried. Whenever piles of any great length have to be driven in ground of uncertain character, experimental inquiry or expert advice is always preferred to mathematical investigation. So theory is subordinate to practice; rather a reversal of latter-day aspirations. The fact is that pile-driving data are still wanting. The weight of the hammer and the height of fall are readily ascertainable in any case, but the practical effect to be obtained is governed by varying and baffling co-efficients. The very force of the blow is difficult to estimate, for it may be reduced by the man in charge of the machine, and the falling weight has to expend energy in hauling the rope and in revolving the drum, as well as in overcoming the friction of the guides. Further, the stroke is cushioned to a certain extent by the broom-like head of the pile above the collar. Even supposing these uncertainties to be expressible by co-efficients, no one can predict exactly how much of the modified force is expended in actually driving a pile, when several men are holding it in position by jamming handspikes between it and the guides, and by hauling at headlines. Another circumstance, not amenable to mathematical treatment, is the clinging action of the earth through which the pile is forced. This action appears to commence directly the pile is allowed to rest, and it frequently happens that a pile driven easily one day may refuse to budge under the same driving force on the next day. In actual practice, the best course for adoption is to drive the pile rapidly to a practical refusal of about 1 in., when a formula may be used if desired. In every case, however, the expert appears to have the last word.

Agreements as to the Easement of Light. THE case of Easton *v.* Isted, decided at the end of last sittings by Mr. Justice Joyce, shows clearly the necessity of making agreements as to the easement of light so plain and full that they can be capable of no misapprehension. In the case in question the plaintiff's father had, in 1873, erected a conservatory, the vertical side of which had portions of it glazed. When this was erected the plaintiff's father made an agreement to pay to the defendant a nominal rental "as an acknowledgment for allowing the window in my conservatory adjoining to open on to and overlook his property, and do also agree to close the same when required to do so." In 1888 the glass side was bricked up, leaving the glazed sloping roof in its original position, and forming the roof of a corridor, and from such date the yearly payments ceased to be made. The defendant subsequently erected a wall on the servient tenement which obscured the skylight in question, and thereupon the plaintiff claimed an injunction on the ground that the skylight had acquired a prescriptive right to the light, and that the agreement of 1873 referred only now to the brick side. But the Judge held that the agreement referred to the whole of the glazed structure. It is obvious that whatever was the intention of the parties, there was something to be said for both sides, though it would be absurd for the owner of a servient tenement to protect himself against the acquisitions of a right to light in respect of one part only of a glazed structure. If, however, the agreement had been more fully and accurately drawn, the matter would have been placed beyond question from the beginning.

Structural Colour. IN a communication to the *Journal* of the Society of Arts Mr. J. D. Crace makes a comment in regard to the paper on "Structural Colour Decoration of Public Buildings" recently read by Mr. Horsley at a meeting of the Applied Art Section of the Society, of which a résumé appeared in our issue of the 8th ult. Mr. Crace complains that in this as in other papers or lectures by architects on the subject of colour in buildings, so much attention has been paid to mere questions of vehicle or of the special technique of particular methods of producing colour, and so little to the actual effect of colour on the architectural design. "The vehicle," he observes, "is of consequence to the painter, of none to the architect":

"It is of much more consequence to the architect that the general scheme of colour should be founded on recognition of the structural lines, that the colour values should be in the right places, and that the borderings and other ornamental features should be arranged, not with a view of 'breaking up the wall surface,' but with careful consideration

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of their effect in expressing or explaining the surface, and in assisting the perception of structure."

Our own criticism on Mr. Horsley's paper, with regard to its title, would have taken another form. "Structural Colour Decoration" (a phrase not infrequently used) we always took to mean colour decoration obtained by the building-up of materials which have natural colour inherent in themselves — marbles, stones, woods, &c., &c.; a far more durable and monumental way of obtaining colour in architecture than that of applied colour. There seems, however, to have been comparatively little reference in Mr. Horsley's paper to this true form of "structural colour," so that we presume he used the words with a different meaning from that which we have always attached to them.

Cheaper Incandescent Gas Lighting.

The general manager to the Welsbach Incandescent Gas Light Co. has issued a notification stating that on and after July 1 next a reduction will be made in the prices of Welsbach mantles and burners, and that "the revised policy of the Welsbach Co. has for its object relations of an increasingly intimate and cordial nature with the gas and allied trades, and the company has therefore decided to close the retail branches which have hitherto carried on operations in various centres." It is, moreover, rumoured that the long deferred trial of the validity of the 1893 Welsbach patent will not take place, as a compromise has been made. We believe that the radical reductions in prices and changes in policy about to be made are largely due to the strenuous opposition to the existing charges by Mr. George Livesey, the chairman of the South Metropolitan Gas Co. Mr. Livesey also considers that the time has arrived when the public would obtain more benefit from cheap gas of low illuminating power than from the present costly supply of higher-grade gas. He proposes to reduce the illuminating power to eight or ten candles, and the price to 1s. 6d., or less, per 1,000 cubic feet. The change suggested by Mr. Livesey would result in a largely-increased demand for gas, especially for cooking and heating purposes, and would, undoubtedly, be greatly to the advantage of the community in general provided that the interests of the consumers were efficiently guarded with respect to the heating value of the gas. For incandescent lighting the value of gas appears to be mainly dependent upon flame temperature, but for heating, cooking, and power purposes the calorific value is the main factor to be considered. It has been repeatedly demonstrated that, generally speaking, the calorific value of coal gas diminishes with its illuminating power, and gas consumers should not consent to any reduction in the calorific value unless full compensation be allowed therefor in the standard price. We believe that the reduction in price proposed by Mr. Livesey would more than compensate for the reduced calorific value, but the consumers should be protected by the adoption of a heating-power standard.

Nernst Lamps.

Although it is nearly four years ago since we described the electric lamp invented by Dr. Nernst, yet it is only now that the finished lamp is being put on the market. As the inventor claims that very considerable economy can be effected by the use of his lamp instead of the ordinary vacuum bulb glow lamp, consumers have been impatiently awaiting the opportunity of testing its merits. Considerable interest has therefore been excited in the paper on "Tests on the Nernst Lamp," by Mr. R. P. Hulse, read to the Birmingham Local Section of the Institution of Electrical Engineers. The tests on the whole are favourable, and Mr. Hulse concludes that it will furnish 1,000-candle power hours at a cost of 11d., as compared with 1s. 3d., which the same amount of illumination would cost it got from good glow lamps. The light also given out by the Nernst lamps is distinctly pleasanter to the eye and better diffused than that given out by the ordinary electric lamp. We would call attention, however, to the fact that the lamps were tested on a battery circuit, so that the pressure remained very approximately constant during the life of the luminous rod. On an ordinary commercial lighting circuit we doubt it such good results could be obtained. There is also one great drawback to the use of these lamps not mentioned in this paper, and that is that on direct current circuits the current must flow through them always in one direction. If the lamp be put in the socket the wrong way round then the life of the luminous rod is a very brief one. If a building were specially wired for Nernst lamps this objection would not apply, as it would be easy to use screw holders for the lamps and always make the thread of the screw of the same polarity. Another drawback is that Nernst lamps, as at present constructed, take from a half to one minute to light up. The heating coil consists of a clay spiral in which is embedded a very fine platinum wire, and inside this spiral the luminous rod is placed. When switched on the heating coil gradually becomes a dull red, and then the luminous rod suddenly becomes incandescent, and an automatic arrangement finally switches the heating coil out of the circuit.

Mr. Rhodes's House at Cape Town.

In our review (September 22, 1900) of Mr. A. F. Trotter's work—"Old Colonial Houses at the Cape of Good Hope"—which contains a chapter upon the origin of that type of architecture by Mr. Herbert Baker, we directed attention to the architectural treatment of the house "Groote Schuur" (great granary) which Mr. Baker designed for the late Mr. Rhodes. In our number of March 24 of that same year we had published four views, with a plan, of the house, which is a professed reproduction of the style of the Dutch colonial house, as seen, for example, in the home of the Cloetes at Constantia. It stands in the midst of extensive gardens lying by the main road from Cape Town to Wynberg, and has replaced the former Governor's country residence which was consumed by fire in 1896, together with nearly all of a perhaps unrivalled collection of old Dutch furniture. Most of the teak wood employed for the interior lining of the rooms and elsewhere at "Groote Schuur" was grown in Rhodesia. Mr. Rhodes was an enthusiastical collector of examples of old Dutch furniture, and possessed a large number of dower chests of rare workmanship and value. The original "great barn," erected by the Dutch East India Company for storing locally grown grain, was reinstated after a fire about fifty-five years ago, and ultimately purchased by Mr. Rhodes.

Newton Hall, Fetter-lane.

The London Positivist Society have just vacated Newton Hall, which we gather will shortly give way to new buildings to be erected for the Royal Scottish Corporation, after designs by Mr. J. Macvicar Anderson, honorary architect to that body. Newton Hall, entered from what yet remains of Fleur de Lys-court, and standing on the site of the garden of a house that had belonged to the Barebone family, lay at the rear of the premises in Crane-court, which Sir Isaac Newton and Sir Christopher Wren bought for 1,450*l.* on behalf of the Royal Society, and which Wren either rebuilt or greatly altered for the Royal Society who migrated thither from Gresham College in 1710. The Royal Society used Newton Hall for their library and museum. The Royal Scottish Corporation bought the property from the Royal Society in 1782, and removed to Crane-court from their original "hospital" in Blackfriars, on the west side of the offices of the *Times*; they leased Newton Hall to its late tenants about twenty years ago, when it was repaired and decorated. The present Scots' Hall was erected in 1879-80, by Professor Donaldson, being his last architectural work, on the site of the buildings by Wren which had been burned two years previously. A drawing of Wren's hall, and the reputed presidential chair of Sir Isaac Newton have been preserved, but Zucchero's portrait of Mary Queen of Scots, and Wilkie's of George IV. perished in the fire.

The Turin Exhibition.

The "Esposizione Internazionale d'Arte Decorativa," about to be held in Turin, is to be opened on April 26. About 1500 exhibitors, representing Germany, France, England, Holland, Austria, Japan, &c., are contributing, and the well-known American millionaire and virtuoso, Mr. Morgan, is taking an active interest in the show. The buildings have been designed by Sig. d'Aronco, architect, of Udine. The front will be decorated with four colossal plaster statues 14 ft. high representing the modern arts of decoration. These are, of course, in the usual style of Franco-Italian sculpture, and are only remarkable for their size.

Society of British Artists.

The contents of the first two small rooms at the galleries in Suffolk-street seemed to promise a better exhibition than usual. Mr. Boot's "A Corner of Isola Bella" (7) is a fine picture in respect of colour; among other things we notice "The Bridge" (9), a small but effective landscape by Mr. Lenfesty; "The Pier" (1) by Mr. E. Ertz, a curious but clever study of effect; "Sunset and Storm" (4) by Mr. E. Gouldsmith; various landscapes by Mr. Arthur Tucker which have a style of their own, though a rather mannered one; "Lobster Fishing off Guernsey" (113) by Mr. G. S. Walters; and a very fine architectural interior, "The Southern Arcades of Sancta Sophia" (122), by Mr. A. Henderson, whose name is known to many of our readers. Mr. Arthur Stewart's "Bannockburn" (53) is no doubt clever in a way, but reminds one very much of a play-

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ing card. The large room and the further galleries do not, unfortunately, show a collection beyond the usual level at this exhibition, while there are some things that have no claim to public exhibition at all. Among the redeeming features are Mr. C. M. Q. Orchardson's portrait of his father (157); "The Crystal Pool" (179), a good little nude study by Mr. W. H. Byles; Mr. Haynes King's two pretty bits of *genre*, "Waiting for the Tide" and "Drying the Nets" (189, 190); Mr. Borough Johnson's village scene, "Moonlight" (202 — too warm in colour for moonlight, though); Mr. Armstrong's "Stapleton Vale" (206), which may be called a landscape study after Constable; Sir Wyke Bayliss's interior of "The Minster, Aix-la-Chapelle" (233); Mr. R. Christie's "Flora" (244); a good, though rather heavy, landscape by Mr. Walter Fowler (270); Mr. Leonard Watts's portrait of Professor Stuart (296); and Mr. Hans Trier's small landscape, "Appledore, Devon" (318). As to Mr. Lenfesty's large coast landscape in the large gallery, "Wild Clouds of Destiny" (262), one recognises both power and ambition in it, but the artist's real feeling for effect and composition cannot, on this large scale, make us forget the cold and inky tone of the prevailing colour, or want of colour. For smaller landscape studies this may pass, but on a large scale this mass of dingy tone is oppressing.

New Royal Academician.

MR. G. J. FRAMPTON, the sculptor, has been elected a full R.A., an election which will command general approval. Mr. Frampton is one of the most powerful and original English sculptors of the day. His teaching, however, has been on the best French traditions, for he was first a pupil of M. Dalou when the latter was in London, and subsequently studied, we believe, under M. Mercié in Paris. While doing honour to the teaching of these great French sculptors, he has preserved nevertheless a distinctly English character and feeling in his work.

LETTER FROM PARIS.

THE thirtieth annual congress of the Société des Architectes Français will be held at Paris this year, from June 2 to 7. The programme comprises:—The discussion of various questions relating to the profession of architecture; visits to buildings of recent construction; an excursion to the environs of Paris; a meeting reserved to the Caisse de Défense Mutuelle; the distribution of awards; and the usual banquet to wind up the proceedings. The following questions are already on the list for discussion:—The responsibility of architects with regard to dry rot and timber disease generally; the revision of the fees of experts before the law courts; the architect and the law concerning labour accidents; and the question of a diploma.

The ground occupied by a portion of the old Marché du Temple has not yet found any purchaser. The authorities are now dividing up the whole surface into small lots, which it is expected will readily be taken up. The Municipal Council has voted the sum of 210,000 francs for the reinstallation of the market between the Rue des Archives and the Rue de Picardie.

The Senate has adopted the scheme voted by Parliament for the reconstruction of the Imprimerie Nationale in the Rue de la Convention. The cost is fixed at 2,920,000 francs (116,000*l.*).

The Prefect of the Seine is placing before the Municipal Council a proposal to organise a competition for street signs and shop fronts. The Prefect in his report states that it would be his object to organise a kind of permanent and democratic street exhibition, so as to interest the general public and persuade tradesmen and others to help to embellish the streets of Paris and render them more picturesque. The competition will be open to painters, sculptors, architects, art workers, and tradesmen.

The *Journal Officiel* published, on March 14, the new law for the protection of authors' rights for works of architecture, sculpture, and the drawing of ornament. The Senate added the words "designers of ornament" to those of architects and sculptors, and referred the law back to Parliament, which at once confirmed and passed it.

A competition has been opened for designs for a new Mairie at Corbeil. The cost of the building is fixed at 9,000*l.*

The Académie des Beaux-Arts has awarded the Prix Leclerc of the value of 64*l.* to M. Louis Boileau, for his design for the arrangement and decoration of a pier in a seaport.

It has at last been decided, after many years of discussion, to instal underground public conveniences at Paris after the style of those at London, and the first two of this kind will be placed under the Place de la Madeleine and the Place du Théâtre Français. The delay which has been made up to now will largely be atoned for by the luxurious manner and style in which these conveniences will be arranged. The approaches to the staircases will be constructed of marble or some hard stone, ornamented with wrought-iron balustrades in Renaissance style. The floors will be paved with mosaic, and the walls lined with opaline and crystal ceramic ware. The manufactory of Sèvres will provide the decorative porcelain and enamels for the decoration of the ceilings and galleries. Carrara marble will be employed in portions, and all the woodwork will be mahogany. It is to be hoped that this new departure will mean the early disappearance of the ugly and insanitary conveniences which at present spoil the effect of the broad pavements of the leading boulevards.

The portion of the Boulevard de la Madeleine known as the Rue Basse du Rempart is being suppressed. A financial group has purchased the portion in recess on the boulevard with the intention of constructing new buildings in a line with the general frontage. The work of suppressing the roadway in front of the portion close to the Madeleine has been commenced, and very shortly a fine wide pavement, planted with two lines of trees, will take the place of the present ugly footway and little-used carriageway.

The new bridge for the Metropolitan railway to cross the Seine a little above the Pont d'Austerlitz has been designed and accepted. This bridge, which will be employed for railway purposes only, will be something quite unique of its kind; a very light and elegant arch, constructed of a lacework of steel, will form one curve 460 ft. wide, with its extremities resting on the river embankments. The height of the top of the arch above the level of the Seine will be 104 ft.

The first portion of the second line of metropolitan railway from the Place de l'Etoile to the Boulevard Malesherbes was inaugurated last week, but the line has not been put into service yet.

The competition of the façades of houses erected at Paris in 1901 is now opened. Fifty-three houses have been entered for the competition. As usual, the six premiated houses will be exonerated from certain street dues, and the architects and owners will receive awards of medals.

The proposed new bridge over the Seine, in prolongation of the Rue de Rennes, which has caused so much discussion and so many protests from the Société des Amis des Monuments Parisiens, has been abandoned, and the scheme proposed by M. Bouvard, and described in our "Letter from Paris" of February 1, is to be adopted. On his plan the Rue de Rennes will be prolonged towards the Rue de Louvre, and the circulation across the river will take place by the Pont Neuf, and the Pont des Arts for pedestrians. As it is expected that the new line of metropolitan railway will considerably decrease the traffic from the Rue de Rennes, it has been decided that no special bridge will be necessary. The new scheme will have the effect of greatly disengaging the buildings of the Institut, and will also afford good opportunities for new building operations.

The Prefect of the Seine has approved the scheme prepared by M. Foucault, architect, for the installation of the Victor Hugo Museum in the house situated at No. 8, Place des Vosges, (formerly the Place Royale) at a cost of 4,600*l.*, of which sum 2,000*l.* have been offered by the heirs of the late poet.

The Conseil-Général of the Seine has voted an important credit for the purpose of forming an avenue in prolongation of the Avenue de la Grande Armée, which will extend in a direct line of nearly thirteen miles from the Place de la Concorde, past the Monument de la Défense, as far as the centre of the Forest of Saint Germain. The town of Nanterre has offered to abandon to the State the ground necessary for the formation of the principal portion of this fine avenue. The first scheme for this road was originated by Napoleon, who much desired to see the avenue continued to the forest in a straight line from the Rond Point de la Défense, but the necessity of a bridge across the Seine caused the scheme to fall through. The avenue will be 130 ft. wide, planted with lines of trees, and will comprise a line of electric tramways, a carriage road, and a cycling track. The cost to the Department of the Seine will be about 40,000*l.*, with the extra cost of about 32,000*l.* for a bridge to cross the two arms of the Seine at Nanterre.

The Syndicat des Industries du Meuble has decided to organise an exhibition, to be held at the Grand Palais des Champs Elysées towards the end of the summer, and to exhibit therein all the most interesting specimens of works of art attaching to the various sections of this art industry. The cost of the installation is estimated at 12,000*l.*

The Imprimerie Nationale is putting into hand the first half of the report on the 1900 Exhibition; the remaining portion will scarcely be completed before the end of the year. The work will comprise fifty volumes, containing 40,000 pages.

The Duc de Loubat has established a new foundation of 250*l.* annually at the College de France, destined to encourage the study of American antiquities.

The offices of the 1900 Exhibition, situated on the angle of the Avenue Rapp, are about to be rearranged for the purpose of installing, for the present at least, the offices of the Minister of the Colonies, who is about to vacate the Pavillon de Flore at the Louvre.

M. Guiffrey, director of the Gobelins manufactory, has just placed on the loom a piece of tapestry the model for which has been made by M. Olivier-Merson, the well-known painter. The tapestry is destined for the Gobelins Museum. The design is simple, and consists of allegorical figures supporting a scroll carrying the device "Par l'art divin de Minerve l'aiguille peut surpasser le pinceau." This tapestry is interesting in the fact that M. Merson coloured his design to suit the various colours of wool employed by the manufactory, instead of the contrary, as is generally the case. It appears that the result is most satisfactory, and M. Merson is completing on the same principle a piece of work entitled the "Triumph of Art," which he commenced ten years ago.

A curious stone obelisk has been brought to light during some building operations at Nanterre, near Paris. The Commission du Vieux Paris has examined the obelisk, which it appears was erected in 1783 for the purpose of measuring the meridian, by Lamesle, "imprimeur des fermes du Roi."

The new buildings of the Cour des Comptes in the Rue Cambon, are advancing rapidly, and the two stories of cellars will be arranged next month to receive the immense quantity of papers coming from the old Cour des Comptes, and weighing over seven tons. The new building will comprise twelve stories, and 185 rooms for the offices appertaining to this service. The archives are arranged to receive 210,000 cubic feet of documents.

The question of permitting female students at the Ecole des Beaux-Arts to compete for the Prix de Rome, and the four years' studies at the Villa Medicis, is being much debated now that female students are permitted to follow the studies of the Ecole and enter the ordinary school competitions. The question has already been decided as regards students of music, but that concerning architecture will probably demand further consideration.

The ten students of the Ecole des Beaux-Arts chosen to compete for the Grand Prix de Rome, the subject for which this year is "Une Imprimerie Nationale" proposed by M. Pascal (and quite a variation from the usual subjects given, which are far from being practical), are now prisoners for over three months in the separate studios of the Ecole during the preparation of their final plans and designs. The subject of the preliminary competition was "A

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Pavilion for a Minister of Fine Arts," and the students chosen as the result of this competition were allowed to compete in a second eliminatory competition, which decided which ten students were to be allowed to compete for the Grand Prix. The result of this competition will be made known on August 4 next. The winner of the First Grand Prix—who is sent to continue his studies at the Villa Medicis at Rome—is allowed an annual sum of 140*l.*, out of which 48*l.* are retained to pay for his keep and lodging expenses. The student passes four years in Italy, from whence he has to send to Paris each year various drawings and studies from the classical buildings of Italy or Greece. He receives for the following four years an annual sum of 120*l.* to allow him to continue his studies at home or abroad. And after that he is generally sure of obtaining some lucrative official appointment reserved for the winners of the Prix de Rome.

The Municipal Council of Paris, before the close of the session, adopted the schemes of four new metropolitan railway lines. The first, from west to east along the Boulevard de Courcelles to the Place Gambetta, is 7 kilometres long, and is to have seventeen stations; estimated cost, 15,607,000 francs. The second, from the Porte de Clignancourt to the Porte d'Orléans, 11½ kilometres, will be entirely underground with twenty-two stations; estimated cost, 81,844,000 francs, including the completion of the Rue de Rennes and the prolongation of the Avenue Raspail. The third line, from the Boulevard de Strasbourg to the Pont d'Austerlitz, almost entirely underground, will have seven stations in a course of 4,307 mètres; estimated cost, 12,200,000 francs. The fourth, from the Cours de Vincennes to the Place d'Italie, will have eight stations in a length of 5,278 mètres; estimated cost 17,400,000 francs. Thus the realisation of this scheme, discussed for thirty years past, will involve a total expenditure of over 127 million francs, or 5,080,000*l.* sterling.

The retiring Chamber of Deputies has testified the usual dislike of the provinces to Paris by refusing to sanction the reduction in the price of gas proposed by the municipal authorities; but the next Chamber will probably set this to rights.

The intention of the Department of Fine Arts to open a house in the Boulevard des Italiens near the Opéra Comique, for the sale of the productions of the Sèvres ceramic manufactory, has fallen through, mainly owing to the protestations of the leading houses in the ceramic industry, who have persuaded the authorities that it would be unfair to injure private firms by this official competition in Paris. It is admitted that, after all, the manufactory at Sèvres, owing to its limited accommodation, which the Government has been willing to go to the expense of extending, is hardly able to keep pace with its official commissions.

After eighteen months of labour, M. Toché, a painter well known for his decoration of the Château of Chenonceau, has almost completed the cartoon for an immense piece of tapestry of 220 square mètres, intended to be presented to the Emperor of Russia, as a souvenir of the Peace Conference at the Hague of which he was the promoter. In the midst of a Dutch landscape, with its flat meadows and windmills, on a pedestal stands the figure of Grotius, the founder of the "Droit International" in peace and war. On the other side is the statue of a Flemish countryman armed with a partisan. In the rear, against a background of foliage, is an architectural composition forming a frame to the statue of the Czar, who holds in his hand an olive-branch. Beneath is a medallion portrait of Queen Wilhelmine. At the foot of this monument are grouped the figures of the 110 delegates from the twenty-six States represented at the Conference, and descending the slopes beneath them is the allegorical figure of a sower going forth to sow the seeds of peace upon the earth. On the left a female figure, symbolising Arbitration, holds in one hand a pair of scales, and with the other hand checks a horse and rider about to trample on the victims of war. A figure of Peace dominates the whole composition, and on the right, opposite to the Arbitration group, are groups representing the joys of pacific toil.* It is doubtful however whether the official establishment of the Gobelins will be able to complete such an immense piece of work within a reasonable time, and it is probable that it will be carried out by private firms who will get through the work, at all events, much faster.

In a few days the Municipal Service des Beaux-Arts will transport to the Petit Palace the greater number of the pictures preserved at Auteuil and in the Hôtel de Ville, and also the marbles recently kept at the Musée Galliera. The arrangement of the new museum will then be commenced, using at first only a portion of the building, leaving sufficient space for future annual purchases. The space left provisionally free will be easily utilised in the meantime for various special exhibitions; that of the shop signs, for instance, to which reference has already been made, to be followed by an exhibition of portraits of women; and among exhibitions to be organised by private enterprise will be one of French lithographs; one of the works of artists of the North of France and the Pas de Calais; one of marine paintings; and a series of exhibitions of foreign art, commencing with Spain. These are not all, but it will be seen that there are plenty to choose from.

In the Galliera Museum there is to be, in May, an exhibition of artistic book-bindings, and in June one of industrial art (jewellry, silver-work, ceramics, furniture, and wall-papers), in which is to be included a foreign section.

We have to announce the decease of two French architects. One is M. P. Bichoff, who, first educated in the Ecole Speciale of Architecture, was afterwards one of the favourite pupils of the late M. Chipiez. In 1872 he entered the atelier of Vaudremer, of whom he became a devoted assistant, and was an artist of undoubted talent. We learn also of the death, at the age of seventy-seven, of one of the oldest members of the Société Centrale des Architectes, M. Tarlier, a former pupil of the Ecole des Beaux-Arts and of Constant Dufeux, and who subsequently settled at Bourges as Diocesan Inspector of Architecture. He carried out a good many buildings in the provinces, and furnished also the plans for the Cathedral of Quito. M. Tarlier gained many awards in public competitions, as well as one in the Exhibition of 1878, and an Honourable Mention from the Societé Centrale, in 1881, in respect of his works in domestic architecture.

ANCIENT LIGHTS.*

IN designing a building an architect has to consider and determine in the best way he can for his client a variety of questions, such as the plan, style, cost, construction, sanitary arrangement, and decoration, and beside these there are the rights and easements attached to the site on which he is building, and the rights and easements of the surrounding buildings over his site. These two latter do not apply as a rule when building in the country, but in large and populous towns they play an important part. Yet some architects shirk these and design their building as if they did not exist.

This perchance may, in an isolated case here and there, work out without trouble where there is negligence or ignorance on the part of the surrounding owners, but in most cases it will lead to infinite trouble, delay, and cost. I know instances in London and elsewhere where a building has been commenced with walls, piers, and foundations intended to carry a superstructure of 60 ft. or 70 ft. above the ground, but when the questions of light and air were determined it was finished short of this by 20 ft. or even 30 ft., entailing great loss in prospective rental, in law costs, and in useless waste in underbuilding and foundations. The architects who adopt this method (or want of method) take up much the same position as many others do regarding drainage, steel construction, &c., &c., viz., to leave it to be decided by experts. It is true that some may call these subjects the drudgery side of the architect's profession, and there is not much credit or fame attached to their accomplishment, but I contend that if an architect is to be the master workman on his building he should be capable of advising and dealing with all the matters that crop up in its design, construction, and carrying out.

Now with regard to our present subject, do not my remarks apply with much greater force. We all have ideals, and are only too glad when the client comes along and gives us a chance of executing them in brick and stone. Presuming then our ideal is drawn out, a noble creation, and it is approved of—is started to be erected. What pleasure we have in looking upon and elaborating the drawings, what fine suites of rooms the plans show—what a rent roll the surveyor places upon them!

The erection is commenced and all goes well until the height of the new structure approaches nearly to the height of a former structure if such ever existed, and then what happens? Mr. Smith across the street instructs his architect to ascertain the particulars of our proposed erection—and Mr. Smith also takes care to tell his neighbours, Mr. Robinson and Mr. Brown what he has done! After a few weeks of trouble and negotiations our ideal is often most desirously spoilt—our floor area curtailed—and so the rent roll lessened—and our client disappointed.

This surely for the ordinary practitioner is not a happy condition to be in, and I do think therefore that it is the duty of an architect to make himself acquainted as fully as possible with what his clients' rights are under the law as it stands, and to be able to advise him accordingly. Light is so essential an element in all our buildings that we ought to know how we can increase it in our buildings, and where and what rights we have to it as far as practicable. I do not at all advocate our going into the technicalities of the law, as if we do so we are sure to go wrong, but to make ourselves acquainted with some of the general broad lines of the same, and we shall, I know, always have the help of our good friends the solicitors on all technical issues as they arise.

What, then, briefly is the law in England regarding the matter and under which most cases are decided. Previous to the third year of the reign of William IV. the rights of owners of property were found in previous Acts and in local usage and custom, but at that time Parliament thought it wise to crystallise, as it were, and embody in one Act and determine so far as an Act of Parliament can what the law should be affecting the subject matter before us, and I think I cannot do better than quote the words of the Act passed in that year and known as the Prescription Act. The words of the Section referring to the matter are:—

Section 3. "When the access and use of light to and for any dwelling-house, workshop, or other building shall have been actually enjoyed therewith for the full period of twenty years without interruption, the right thereto shall be deemed absolute and indefeasible, any local usage or custom to the contrary notwithstanding, unless it shall appear that the same was enjoyed by some consent or agreement expressly made or given for that purpose by deed or writing." Section 4 states, "Each of the respective periods of years hereinbefore mentioned shall be deemed and taken to be the period next before some suit or action wherein the claim or matter to which such period may relate shall have been or shall be brought into question, and no act or other matter shall be deemed to be an interruption within the meaning of the Statute unless the same shall have been or shall be submitted to or acquiesced in for one year after the party interrupted shall have had or shall have notice thereof, and of the person making or authorising the same to be made."

Although this Act was passed in 1832, few actions and very little notice seems to have been taken of the effect of its clauses until thirty years after it came into force, when the increasing prosperity of the country and the consequent increase of the value of land, especially in towns, forced the subject on the minds of holders of landed property. In centres of population and trade land is sold and bought at a keen competitive price, and the owner or his leaseholder is anxious to obtain as much rent as he can out of the building erected upon the site; that, in point of fact, means he wants to go as high as he can, and with rapid and easy means of access by lifts he can rely on getting a good return for his capital outlay.

What the Act does is this, it gives as an absolute right the access and use of light to any building, if such has been enjoyed for twenty years previous, and if this is interfered with and the amount of light which was formerly enjoyed materially reduced, there is a just cause for complaint, as the complainant has been deprived of what the law says he has a right to enjoy. Before the Act was passed there was an old local custom in the City of London that new buildings might be built to

* One might ask the painter, however, whether he never heard of such a thing as "The joy of battle."

* A paper read before the Bristol Society of Architects, on March 10, by Mr. Howard Chatfeild Clarke.

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any height on old foundations, and Lord Cranworth said: "The growing necessity for lofty buildings is shown by the great multiplication of them in all parts of the metropolis, and I cannot but fear that serious inconvenience may be felt by the abolition of the alleged custom." How true his lordship's words have now become!

I believe the Act does not bind the Crown, and no right in respect to light can be acquired against it under the Act. A case on this point was that of "Perry *v.* Eames," where certain land in the City of London became vested in 1820 in Trustees for the Crown. In 1886 it was sold to the Corporation of the City of London, and in 1890 it became vested in the defendant under a building agreement. The defendant erected upon it buildings which obstructed the ancient windows of various adjoining owners, the plaintiffs. In actions they brought it was held by Mr. Justice Chitty that previous to 1820 that there could have been no prescription, owing to the custom of London: That Section 2 of the Prescription Act does not apply to light, and that the Crown not being mentioned is not bound by Section 3, and that therefore the plaintiffs failed.

This being the law in England, I think it may be useful to see for a moment the position of similar matters elsewhere. In Scotland the Prescription Act does not apply as set out in Section 9, but the Act was extended to Ireland by the 21 and 22 Vict., cap. 42.

In the United States, I understand, no right of light is obtained by prescription.

In Australia, I believe, twenty years' enjoyment does give a right to light.

In India, right of light are prescriptive in both British territory and in the Native States.

In British territory the English law on the subject applies, and to some extent in Native States also.

In Sweden no window or opening is allowed in a wall facing a neighbouring plot unless it be distant at least 7 ft. 9⅛ in. to 14 ft. 6 in. from the boundary, except by consent of the owners of that plot. His consent does not bind a subsequent owner unless the latter ratify it.

No window or opening is allowed in a party wall adjoining another and lower house so as to overlook the roof except by special permission of the Building Committee, consent of adjoining owner, and provision of fireproof shutters to openings. The consent of the adjoining owner shall not prevent him from subsequently raising his own building higher, even though this should obstruct or build up such openings.

In France there are no prescriptive rights attaching to windows. The code provides that neither windows or balconies may be formed parallel to the boundary at a less distance than 6 ft. 2 in., nor in a wall at right angles or oblique to the boundary at a less distance than 1 ft. 11 in. In streets, these being public property, no rights of light accrue.

No openings or windows may be made in a party wall by one owner without the consent of the other, but the owner of a wall abutting on the boundary line is permitted to make openings for light on sufferance provided such openings are fitted with stout iron bars and furnished with sashes glazed with obscure glass.

Notwithstanding the easier laws elsewhere, however, during the last forty years in England actions have largely increased during a period of great building activity, and often much serious loss has been the result to all parties concerned.

When any one is building or rebuilding in a town, he is soon made aware of the fact that he has, quite unsolicited, gained the earnest attention of his surrounding neighbours, who are all up in arms to defend their right, or what they think are their rights. If the building owner desires to live at peace with all men, he will do well to keep his new building to the height of the old one unless he can agree with all parties to increase the same. But there are many cases in which a building owner can increase his building without making himself liable to his neighbours by damaging their "use and access of light." I can give no general advice on this, as each case depends entirely upon the special circumstances in which it is placed, but additions should only be erected on competent advice.

The most common cause of complaint of infringing the access of light is by a building owner raising his building higher immediately opposite; this is what is termed "direct" interference. If the building is not immediately opposite, then the infringement is not considered so great, but is still an interference, and is called "lateral." The occupier or owner of an ancient light is entitled to have and enjoy the light that his window receives; that is his indefeasible right given him by law. But, on the other hand, he must be careful to make sure that his opposing neighbour's new building will damage his light, and this damage must also be a "substantial interference," for without that there is no right of action. If he can prove that there has been a substantial interference, he will get redress from a court of law; if not, he will be sorry he tried to stop his neighbour's work: for, supposing that he has put the law in motion in the manner that a number of claimants do, by applying for an *ex parte* injunction, this will be granted to him if the judge thinks the evidence sufficient, but only upon the plaintiff giving his undertaking in damages, and if the injunction has been wrongly applied for, to pay for the defendant's loss and damage.

A number of actions to restrain neighbours in rebuilding are entered upon without counting the cost and without first ascertaining if substantial damage is going to arise. The difficulty is that the law fixes no standard of light to which alone a plaintiff is entitled; and, as a learned judge has recently said, "he must not be fanciful or fastidious, and must recognise the necessity of give-and-take in matters of this nature."

Where there is good ground for proceeding I should advise a plaintiff (*i.e.*, assuming that all friendly negotiation has failed) to issue a writ, and to endeavour to have the case heard forthwith. It is a better and safer course to pursue than the *ex parte* method. The latter method, of course, is useful where time is of importance; but the rushing up of a building is in itself the sign of a weak case, and is not a safe course to adopt, as the judges' decisions so often remind us.

I hope I am not treading upon dangerous ground when I say on this subject of "Light and Air" we could do with a good deal less law and a little more of open negotiations. A few years ago there was a change made in the method of conducting the business of—I think it was—the Colonial Office, and to which was given the name of the "new diplomacy," or showing your hand and saying what you intended to do. I do not know what success attended it, nor am I very much concerned to know; but I think we might take a suggestion from it in dealing with a subject-matter like the one before us. I do not see what good is done by keeping your intentions secret; of the evil that is done I can assure you I have seen enough! I propose, therefore, we should consider for a short time some of the cases bearing upon the subject, especially some of the more recent ones, and then to set forth the suggestions recently made by the joint committee of the Royal Institute of British Architects and the Surveyors' Institution for the amendment of the law as it now stands.

I do not know that a building has ever been definitely defined under the Acts, but in "Harris and De Pinna" it was held that a place for storing timber on stages erected on timber uprights resting on brick piers with a roof and open sides was not a building within the third section of the Prescription Act. The judge of first instance made the following suggestion, although he admitted it was not a decisive one: "Would this structure be such as would put a reasonable man on his guard against the acquisition of the easement of light so that he might thus, being put on his guard, protect himself against the acquisition of the right? It appears to me that it would not."

Then, with regard to the extent of the right to light when it has been enjoyed for twenty years. The words of the Act are, "When the access and use of light to and for any dwelling house, workshop, or other building shall have been actually enjoyed therewith for the full period of twenty years without interruption, the right thereto shall be deemed absolute and indefeasible." It would thus seem that the right of the dominant tenement is a right to enjoy exactly what it has hitherto enjoyed, and Lord Cranworth says: "The right conferred or recognised by the statute is an absolute indefeasible right to the enjoyment of the light, without reference to the purpose for which it has been used. Therefore, even if the evidence satisfied me—as it does not—that for the purpose of their present business a strong light is not necessary, and the plaintiffs will still have sufficient light remaining, I should not think the defendant had established his defence unless he had shown that, for whatever purpose the plaintiffs might wish to employ the light, there would be no material interference with it."

In the great building development in the country of recent years this clear statement of the law would have, indeed, dealt great hardships, and I think that to find a middle course has often been the endeavour especially of defendants, and so arose the rough rule-of-thumb scheme that if the owner of the dominant premises received an uninterrupted angle of 45 deg. of sky from the zenith, that such was sufficient. It cannot be too clearly pointed out that this is not the law, and to act upon may throw the parties into serious trouble. The case of "Theed *v.* Debenham," as far back as 1875, clearly illustrates this. The plaintiff was a sculptor, and had a lease of a studio, and the defendants were the well-known silk mercers. They desired to raise their buildings some 8 ft. higher in a roadway 31 ft. from wall to wall, with the ridge of a roof 7 ft. above the new parapet. The plaintiff claimed that for his work a clear uninterrupted horizontal light was necessary, and Vice-Chancellor Bacon held that, having enjoyed for more than twenty years the light, the property in such light belonged to him, and no one had a right to take it away from him, although the angle of 45 deg. would be left to him. The Vice-Chancellor added: "In my opinion, the defendants have no more right to take away the light which the plaintiff has been enjoying than they have a right to take away the front wall of his house."

What, then, is the position of the matter if windows which have already acquired rights of light are altered—if they have been enlarged, for instance, so increasing the burden over the servient tenement? In the case of "Tapling and Jones," heard by the House of Lords in 1865, this point was clearly dealt with and settled. The plaintiff made various alterations in his premises, 107, Wood-street, by lowering the first and second floors, and by lowering the windows in such floors to make them correspond to his adjacent floors in Nos. 108 and 109, Wood-street, and he erected additional stories, in which he placed new windows. These new lights it was impossible for the defendants to block out without obstructing that portion of the windows which occupied the site of the ancient windows in No. 107. The defendant built up his premises so as to obstruct the whole of the windows of the plaintiff's. It was held that the plaintiff had not abandoned his rights, and the Lord Chancellor said:—

"Suppose, then, that the owner of a dwelling house with such a window, that is with an absolute and indefeasible right to a certain access of light, opens two other windows, one on each side of the old window, does the indefeasible right become thereby defeasible? By opening the new windows he does no injury or wrong in the eye of the law to his neighbour, who is at liberty to build up against them, so far as he possessed the right of building on his land, but it must be remembered that he possesses no right of building so as to obstruct the ancient window—for to that extent his right of building is gone by the indefeasible right which the statute has conferred."

I think, however, each one of us should be very careful when altering ancient lights to see that the altered light is coincident with, and contains either the whole of the light of that which has acquired the right to the light or a substantial part of it.

Does the destruction of a building necessarily destroy the right to light its apertures have enjoyed? The well-known case of "the Ecclesiastical Commissioners *v.* Kino" dealt with this point. It was a case where an old City church had been removed and the site was unoccupied. The defendant was about to build to a height which would have obstructed the light to the windows of the church if it had been standing. In the Court of Appeal, to which the case was taken, Lord Justice James said: "It appears to me that when a building in which there are ancient lights has been taken down, though the actual enjoyment of the lights has been suspended, there is nothing to prevent the owner from applying to the Court for an injunction to restrain an erection which would interfere with the easement of the ancient lights where the Court is satisfied that

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he is about to restore the building with its ancient lights."

The further question of what is abandonment is interesting. Some years back I was interested in the case of "Cooper *v.* Straker," which dealt with this point. The plaintiffs were wool brokers, and had large warehouses off Bishopsgate-street Without. Their windows were fitted with external iron shutters, which were largely kept closed, but were capable of being opened, and were opened at times. Lord Justice Kay, in his judgment, says: "I take 'enjoyed' to mean having had the amenity or advantage of using the access of light, that is nearly equivalent to 'having had the use,' the intention being that the owner of a house may acquire the right to have the access of light over an adjoining land to an opening which he has used in such manner as suited his convenience for the passage of light during twenty years." It was thus held that there was no abandonment in this case, and the plaintiffs were successful in their action.

There are, of course, many other alterations of ancient lights which have been dealt with by the Courts from time to time, but I think the above-named are some of the most important, and ones which are likely to be met with in daily practice.

The question of lateral light is one of great importance, and often the most difficult to deal with, and I think every architect must be especially careful in these cases to consider the access from which the light to the dominant windows is obtained and to advise accordingly. If the access of light is limited on two sides and is mainly derived from the third side, which is being interfered with, then any interference must be in proportion greater than if the access is equal from all three sides. In a recent case in this city of lateral light I endeavoured to clearly show this on a diagram of which I exhibit a copy, and after a long trial Mr. Justice Farwell held there had been a material obstruction of light to the plaintiff's premises. In this judgment also the judge held that because an aperture now only gave access of light to a water-closet, that this apartment was capable of being adapted for other purposes such as for the use of a couple of clerks, and added, "nor am I disposed to say as a matter of law that small rooms used as a convenience as those are, are not entitled to the access of light."

Recently two important cases have been decided by the Court of Appeal, and as they are the most recent exposition of the law as it now stands, I venture to quote them rather fully.

The first case is that of "Warren and Others *v.* Brown," tried before Mr. Justice Wright in August, 1900. "The facts are these. The plaintiffs, as the owners and the tenant of a building in the town of Leicester, claim damages and an injunction in respect of the obstruction of the access of light to windows more than twenty years old. At the trial the claim was limited to two rooms, one on the ground floor, and the other above the former, both facing the south. For a length of about 17 ft. in front of these rooms the defendant had raised his own building from a height of about 20 ft. 6 in. to about 26 ft., but has set it back about 2 ft. or 3 ft., so that the width of the street between the two buildings, which was about 17 ft., is now about 19 ft. Four out of the five windows in each of the two rooms are opposite to that part of the defendant's building which I have mentioned. These windows are large and high. Those of them which are on the ground floor are and have been glazed with fluted glass for about half their height from the bottom. In addition to the front light, both rooms receive much side light, especially from the east and east-south-east, from a wide street running north and south at a distance of about 50 ft. to 70 ft. Light is not in any direction cut off by very high buildings. To the south-east the defendant has taken down a high chimney stack which to some extent used to intercept the light from that quarter. I find that the defendant has not obstructed or diminished to any material extent, if at all, the light coming to the upper of the two rooms in question. As regards the four windows on the ground floor, I find that the defendant has materially diminished the light which the plaintiffs enjoyed for those windows for twenty years past, but that abundant light remains for all ordinary purposes of inhabitancy or business. The room in its present state is better lighted than the ground floor rooms in many of the principal streets. In my judgment, no sufficient case for a mandatory injunction is made out in any view of the plaintiffs' rights. The question is whether the plaintiffs are entitled to damages. If they are I assess the amount at 100*l.* for the tenant and 200*l.* for the reversioners." Judgment was accordingly entered for the defendant with costs.

The appeal was heard on October 29, 1901, and the judgment given on November 13, 1901, by Lord Justice Romer, on behalf of the Lord Chief Justice and Lord Justice Vaughan Williams and himself. Having set out the facts that Mr. Justice Wright has found that the plaintiffs had in fact suffered substantial damage which he assessed as above set out, had made an additional finding, and by reason of that he had dismissed the action. Lord Justice Romer goes on to say: "After consulting Mr. Justice Wright, we have no doubt as to the meaning of the additional finding. It means that though the light coming from certain of the ancient lights has been substantially diminished, although the rooms hereby lighted have been so darkened that both the tenant of the reversioners have suffered substantial damage, yet the darkened house is still as useful for purposes of habitation or business at what we may term the average run of houses. In other words, the learned Judge appears to think that as a matter of law there is a sort of standard in the matter of light, and that if a particular house is by its ancient lights extremely well lighted, those lights may with impunity be substantially interfered with so long as the house in its darkened condition does not fall below the standards. In our opinion that is an erroneous view of the law. The precise point arising in this case was clearly dealt with by Lord Justice Mellish in 'Kelk *v.* Pearson,' where he says: 'I cannot think that it is possible for the law to say that there is a certain quantity of light which a man is entitled to and which is sufficient for him, and that the question is whether he has been deprived of that quantity of light. It appears to me that it is utterly impossible to make any rule or adopt any measure of that kind. It is essentially a question of comparison whether by reason of deprivation of light the house is substantially less comfortable than it was before.' This statement has been since approved of and followed in many cases, and we believe it accurately states the existing law on the subject. The case has been treated before us by both parties as one turning solely on the findings of Mr. Justice Wright. He has found substantial interference with light and substantial damage to the plaintiffs, and that being so, there should be judgment for them for the damages assessed. The defendant ought to pay the costs of the action and this appeal."

The second case is that of The Home and Colonial Stores (Limited) *v.* Colls. This action was tried before Mr. Justice Joyce late in 1900. The plaintiffs claimed an injunction to restrain the defendant from erecting on the site of 44, Worship-street, any building so as to darken any of the ancient lights of the plaintiffs, as the same were enjoyed previously to the taking down of 44, Worship-street. The plaintiffs were entitled for the residue of a term having about seventeen years unexpired to a considerable block of buildings situated on the east side of Paul-street, at the corner between that street and Worship-street, which runs westward from Paul-street, so that the plaintiffs' building had a west front to Paul-street and a south front of about 150 ft. in length to Worship-street; Worship-street being about 41 ft., or thereabouts, across. Opposite a portion of the south front of the plaintiffs' premises in Worship-street was the site of some buildings recently removed which was about 36 ft. in width and numbered 44 in the street. The buildings which formerly stood on this site were 19 ft. 6 in. in height, and the defendant had entered into a building agreement to erect on this site a building which, if and when completed, would be 42 ft. in height.

On the west of the defendant's premises, and at the corner between the south side of Worship-street and the east side of Wilson-street, there was a public-house 33 ft. in height, and none of the buildings in Worship-street on the east of the defendant's premises exceeded that height. Mr. Justice Joyce thought it tolerably clear and he found as a fact that the defendant's building if erected to the height of 42 ft. as proposed would not materially interfere with the access of light to any window on the first floor of the plaintiffs' premises or with any light to which the plaintiffs were entitled in respect to their basement. The real only question in his lordship's opinion was with respect to apprehended injury to the third and fourth windows counting from Paul-street on the ground floor of the plaintiffs' building. Those windows were of a large size, but although the top light was said to be the most valuable and important the uppermost part of each of the windows was filled with coloured glass to a depth of 20 in. from the top, and there were wire blinds fixed at the bottom of each window.

The portion of the ground floor of the plaintiffs' building which were opposite the defendant's premises, was used as an office. It consisted of a large room 11 ft. 10 in. high and of unusual depth, and the back wall being upwards of 50 ft. from the north of the front, and it had no window nor source of natural light at the back. This room contained several desks used by about ninety clerks in the employment of the plaintiffs for the purpose of their business.

His lordship held upon the evidence that the plaintiffs' premises would still, after the erection of the defendant's building, be well and sufficiently lighted for all ordinary purposes of occupancy as a place of business, and that the action therefore failed. Immediately upon his lordship's judgment the plaintiffs gave notice of appeal, whereupon the defendant proceeded with the completion of his building.

The Court of Appeal gave judgment on December 20, 1901, allowing the appeal.

Lord Justice Cozens-Hardy said: "The true law with reference to the interference with ancient lights has been authoritatively laid down thus: 'If ancient lights are interfered with substantially and real damage thereby ensues to tenant or owner, then that tenant or owner is entitled to relief.'" His lordship quoted Chief Justice Tindal in Parker *v.* Smith. "It is not every possible, every speculative exclusion of light which is the ground of an action, but that which the law recognises is such a diminution of light as really makes the premises to a sensible degree less fit for the purposes of business." Lord Justice Cozens-Hardy added, "In our opinion, on the balance of evidence, substantial interference and real damage will result, and the proper judgment would have been to grant an injunction in the settled form known as the 'Yates *v.* Jack' form. But immediately after the action was dismissed with costs the plaintiffs gave notice of their intention to appeal. Notwithstanding this, the defendant has proceeded with and completed the erection of his building. Under these circumstances there is only one course open to us. We must reverse Mr. Justice Joyce's judgment and give the plaintiffs the judgment to which according to our view they are entitled, and we must grant a mandatory injunction requiring the defendant to pull down anything erected in breach of the terms of our injunction. This point was really decided by the Court of Appeal in 'Parker *v.* First Avenue Hotel Company.' The defendant must pay the costs here and below."

Lord Justice Vaughan Williams said: "The judgment which has just been read is the judgment of the court; but I wish to add for myself that so far as the rule of 45 deg. is concerned, I doubt very much whether that rule, as the law is now settled, can be regarded even as a rough measure of the right of the owner or occupier of ancient lights."

These two very important judgements, so recently delivered, take us as far as we can go with the law of our subject, and by them you will see the Court of Appeal have given very full scope to the rights of the dominant owner. I should, however, advise any practising architect not to rely too much on any judgment, but to use also his common-sense in each case, and in many cases he would do well to see if he is not able to make some arrangements with the servient owner.

You will have seen by the foregoing paper, and you will know by your own practice the great expense and the still greater trouble of delay which arises in light and air actions. As the trouble has been increasing so much of recent years, and the dominant owner has so often used his rights in an improper manner, the Council of the Royal Institute of British Architects and the Council of the Surveyors' Institution each appointed three of their body as a joint committee to go carefully into the matter and report. This committee also had the valuable assistance of Mr. Fletcher Moulton, K.C., M.P., and of Mr. George Freeman, K.C.

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The joint committee recommend that the law and practice in respect of ancient lights be amended as follows:—

1. The right to ancient lights shall, in all cases where such rights have not been already acquired, be limited to a right to receive light sufficient for all ordinary purposes, but shall not include a right to light of extraordinary amount for special purposes.

2. After the passing of the Act the owner of any tenement not at the time servient to some neighbouring tenement, but over which such neighbouring tenement would in course of time acquire dominant rights, may serve upon the owner of such neighbouring tenement a formal notice, in form and manner prescribed by the Act, and may advertise the same in the daily papers, and register the same at the Land Registry, where one exists, of the district, or where no such Land Registry exists at the offices of the County or Municipal Council of the locality. Such notice shall have the same effect as though an interruption had been submitted to for one year, and such notice shall run with the land.

3. The owner of a building which is about to be taken down may cause plans, sections, and elevations to be prepared, and such drawings if they be attested by the District Surveyor in London, or the County or Borough Surveyor elsewhere, shall be accepted as legal evidence. Such drawings shall on demand be certified and registered by the officers above named, who shall be paid fees on a scale appended to the Act.

4. No building erected after January 1, 1905, shall acquire any fresh rights of light or air where it abuts on any street, highway, road, court, or alley used by the public, or as an access to various tenements, either held in the same ownership or in various ownerships.

5. The owner, lessee, or occupier of any tenement, who considers that his ancient lights will be or have been interfered with by the erection or proposed erection of new premises or alterations to old ones, shall have the right to inspect (or have inspected on his behalf) the drawings which shall be prepared by the building owner of the premises which cause such interference; or if no drawings are in existence to be informed of the intentions of the building owner, and to take or have taken such particulars from the drawings or information or from the building itself, if erected, as may enable him to ascertain where there is ground for complaint.

6. If such neighbouring owner, lessee, or occupier, considers that the lights of his premises will be interfered with, he shall, within seven days from obtaining such information as aforesaid, give notice in writing by registered post of his objection to the building owner, together with the name and address of a surveyor who shall have power to act on his behalf.

7. Within seven days of the receipt of such notice the building owner shall acknowledge the said notice, by registered letter, and inform the person from whom he received notice of objection of the name and address of his surveyor, who shall also have power to act on his (the building owner's) behalf.

8. Such two surveyors so appointed shall, within ten days of the date of the appointment of the last of them, select and appoint an umpire under their hands in writing, such umpire being a member of the Royal Institute of British Architects or of the Surveyors' Institution. The first-named two surveyors shall within the like period meet and discuss the points raised by the owner, lessee, or occupier, with a view of settling the same, and failing coming to a settlement they shall refer the matter to the umpire appointed as aforesaid. The said umpire shall view the site and buildings of both plaintiff and defendant, and shall have power to take such evidence upon oath as he may think necessary, and he shall, within twenty-one days from the date of the matter being placed before him, or within such extended time as he may from time to time determine, issue his award, in which he shall determine either or all of the following points: the right of the building owner to carry out his intended works, the alteration (if any) necessary to be made in carrying out the proposed new buildings or alterations to prevent or lessen the obstructions complained of, and the amount (if any) of compensation of every description to be made to the owner, lessee, or occupier, the alterations or improvements to the adjoining premises by light-reflecting surfaces, enlargement of lights, heightening of

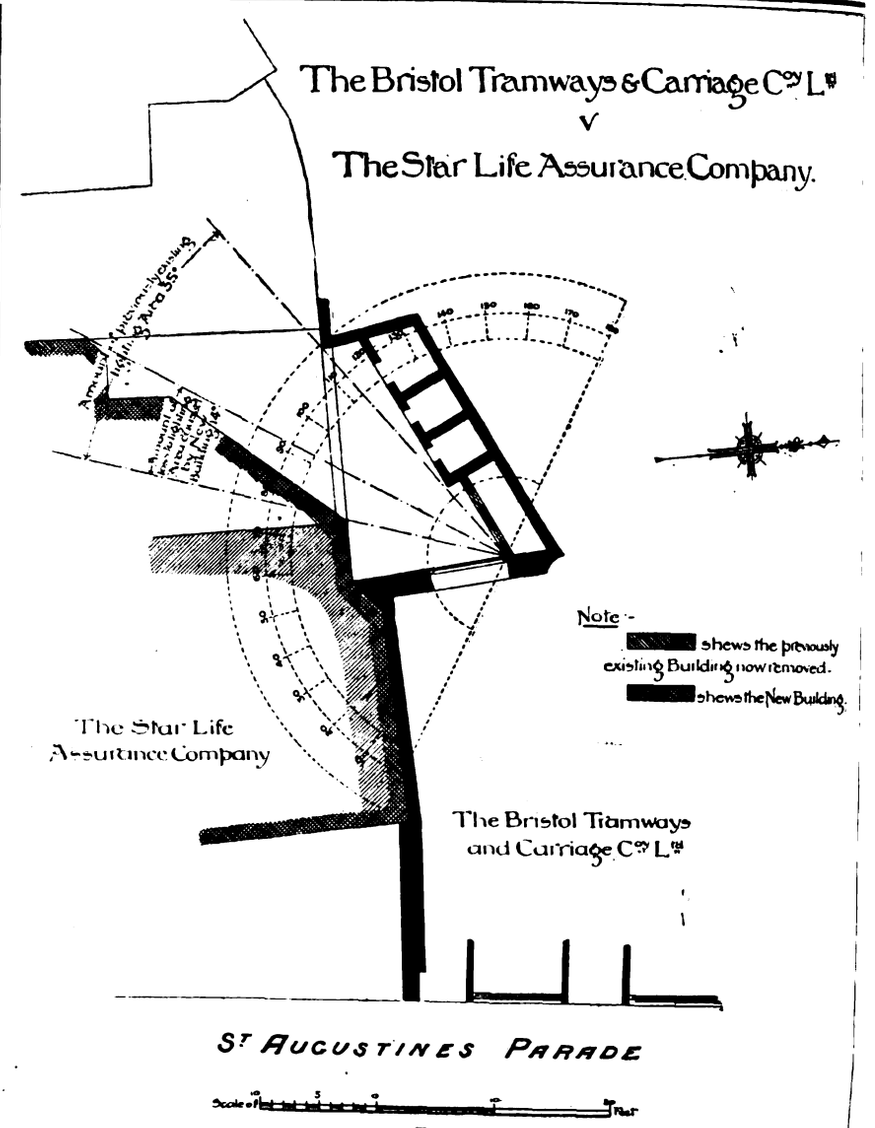
The Bristol Tramways & Carriage Co^y L^d
v
The Star Life Assurance Company.
Note:-
shews the previously existing Building now removed.
shews the New Building.
The Star Life Assurance Company
The Bristol Tramways and Carriage Co^y L^d
St Augustines Parade

Fig. 1.

premises, or other means, the amount of costs to be paid by each or either party, and generally all matters required to arrive at a settlement.

9. In the event of either party neglecting to appoint a surveyor within the time prescribed, or of the unwillingness of the umpire appointed to act, and no other umpire being agreed upon within a further period of ten days, either party shall apply to the President for the time being of the Royal Institute of British Architects, or the President of the Surveyors' Institution, who shall appoint an umpire forthwith, with all the powers as before described.

10. If either party shall be dissatisfied with the decision of the umpire, he may appeal to an Appeal Committee to be formed of nine persons, appointed annually, viz., three architects to be appointed by the Royal Institute of British Architects, three surveyors to be appointed by the Surveyors' Institution, and three barristers to be appointed by the Home Office. Three members, of whom one shall be an architect, one a surveyor, and one a barrister, shall form a quorum. The decision of this Committee, save as hereafter mentioned, shall be final, and they shall have full discretion as to costs. Before giving a decision, the members sitting on the case shall personally visit the premises of the plaintiff and defendant, and shall have power to decide whether, and, if so, to what extent the proposed new buildings shall be amended or the dominant premises altered.

11. In the event of either party refusing to accept the decision of the Committee in all cases in which a larger sum than 500*l.* is awarded either in money, damages, or works, or in which the interference with the proposed works exceeds 500*l.* in value, he shall have power within one month from the publication of the said decision to bring the matter before the High Court of Justice by a summary process. The Court shall have the full powers set out in Clause 9 aforesaid.

12. In any action to restrain building on the ground of its interference with the rights of light, and whether an interim injunction has been obtained or not, either party may apply to the Judge by summons, either to hear the same with an assessor or assessors, or to refer the same to arbitration in accordance with Clauses 9 and 11. If at the hearing of such application or motion for injunction it appears to the Judge that the claim may be satisfied by damages, he may himself refer the case to such arbitration, and if he considers that the action for an injunction has been commenced unreasonably or unnecessarily, may order the party bringing such action to pay the defendant's expenses and costs on such scale as he may deem fit.

This Report has had the approval of both Councils, and a Bill has been drafted and submitted to each Council. I sincerely trust it will at an early date be introduced into Parliament. By it you will see the whole scheme has been to prevent the rights of dominant owner being used in any unfair way against the servient owner, and to set up a simple professional tribunal to deal with the matter—quickly and with little cost. I believe myself if this Bill were made law we should have little further trouble in erecting our buildings on a fair and equitable basis to all parties concerned.

You will notice by this report that the whole idea is to limit as much as possible the rights of the dominant owner, and to set up a fair and easy tribunal to deal with the cases as they arise. Clause 1 is intended to limit the light a man is to acquire to a sufficient amount for all ordinary purposes, and that he shall not acquire light for special purposes. This you will see is largely on the lines of the two cases above quoted as decided by the Judges of First Instance, and it does appear to me to be a fair provision, as a man always has the remedy in his own hands when building for a special purpose, and can erect his lights accordingly.

No. 2 is suggested to obviate the absurd

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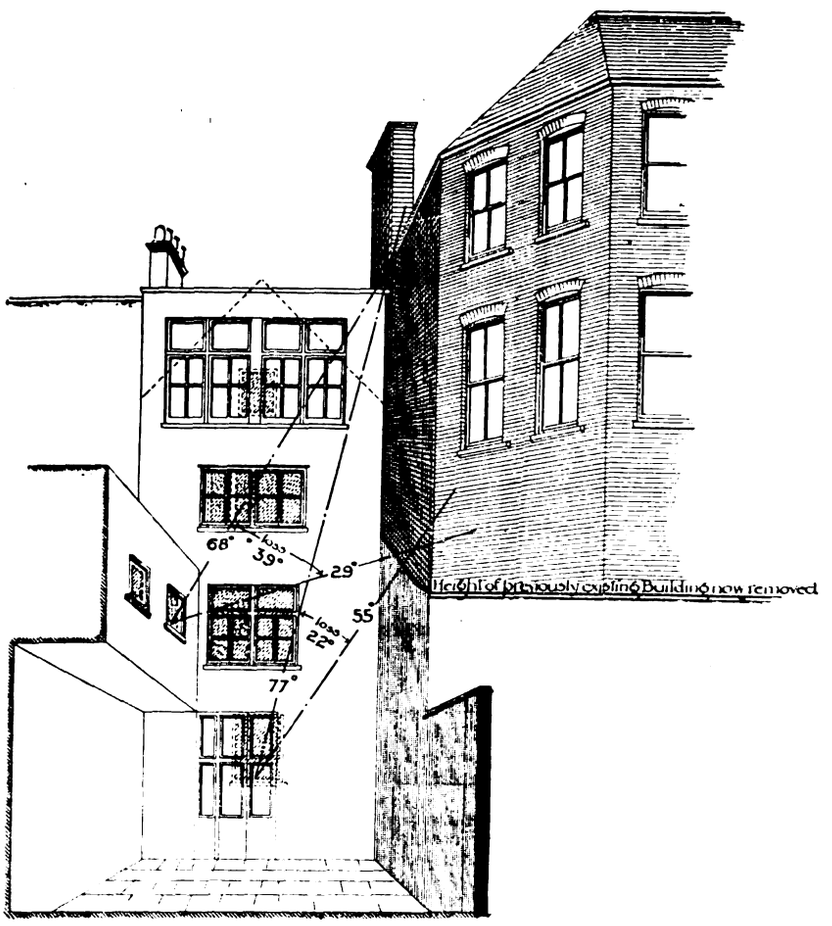

View of Back or West wall of The Bristol Tramways and Carriage Co^ys Premises shewing the Ancient Lights by Dotted lines.

Fig. 2.

steps one now has to take of erecting a screen—often at great cost and always most unsightly—by the service of a written notice duly advertised and registered—such notice running with the land. I think we shall all feel this is a simple and practicable suggestion. It is quite extraordinary the trouble one has to get owners to enter into a simple agreement not to acquire rights over one's property. I recently had a case at the edge of London where backing into the gardens of some almshouses a whole row of fifty or more houses were erected with windows overlooking the gardens about 5 ft. distant from the boundary wall. After much trouble I obtained an agreement from all the parties except some three houses—these belonging to some ladies. These good women absolutely refused to enter into an agreement, and I had to erect a permanent screen in front of their windows at the boundary of my client's property at a cost of upwards of 100*l.* Nos. 3 and 4 speak for themselves, but I think No. 4 is important, as we all surely ought to have common rights into streets and roads; and of course the height we can build on these is now often limited by local Acts and by-laws. Nos. 5, 6, 7, 8, and 9 set up a procedure practically upon the same lines as the procedure under our London Building Act regarding party-wall matters; that is to say, leaving the matter to our surveyors or their umpire to deal with.

Do you not agree that this would be a reasonable and fair way of dealing with the matter? It would give the dominant owner the opportunity of seeing what is proposed to be erected, and the two surveyors will for their own sakes select their umpire with every care. Do we not know, as a matter of fact, how extremely well this course works in party-wall cases? Look at the hundreds of party-wall awards which are entered into in every year, and then try and find any reported cases of party-wall disputes. They are few and far between. No. 10 sets up a tribunal of appeal somewhat on the lines of the Building Act Tribunal, to which a litigant can appeal, by which tribunal he would have his case heard before a legal mind, helped by expert advice and assistance—a really practical tribunal, and one which I believe would be able to deal with these technical cases which so often turn on matters of fact. This tribunal would have to view the premises under the Committee's suggestion. This simple procedure has been urged by all architects for so many years, and it would be feasible with such a tribunal, although it is impossible for a Chancery Judge to do so at the present time.

No. 11 gives the litigant full power to go to the Courts if he is dissatisfied, but personally I should have no fear of many cases ever being taken to this stage. It will be noted in the eighth suggestion that the umpire shall determine not only as to the right of the building owner to carry out his intended works and any alterations necessary to be made in them, to prevent or lessen obstruction, but the umpire shall also have the power to award compensation for alterations and improvements to the plaintiff's premises, by light-reflecting surfaces, enlargement of lights, raising of premises, &c. This, I think, is also a very fair suggestion, as often the enlargement of a window or skylight will give more light than formerly was enjoyed, even with some obstruction caused to the ancient part of the same.

Many large estates have adopted the plan first suggested by the late Mr. Arthur Cates, when acting for the Crown Estates, viz., that all leases contain a proviso, taking away from the lessee all right of light over adjacent Crown lands. Mr. Cates wrote, in April, 1900:—"This proviso has worked admirably, litigation has been prevented, the development of the estate has not been impeded by rapacious or cantankerous owners of dominant lights the rents obtained have not being affected, and no one has been injured by its operation."

A recent case has been before the Courts upon one of these restrictive covenants; it is "White *v.* Harrow. Harrow *v.* Marylebone District Property Company." White was the lessee from the trustees of the Howard de Walden estate of 24, High-street, Marylebone for a term expiring in 1932. By a deed of August 3, 1899, White demised the house to the defendants Harrow for a term of twenty-one years, together with all yards, areas, vaults, ways, lights, easements, water-courses, and appurtenances to the said premises belonging. The lease contained a covenant by the lessee that he would not "object to any works to adjoining premises which may be sanctioned by or on behalf of the lessor or the superior landlords or landlord." It appeared it was the recognised practice of the estate to insert such a covenant in all leases of property on the estate. The lease also contained a covenant by the lessor for quiet enjoyment of the premises. The above-named Marylebone District Property Company had acquired an interest in certain property adjoining to No. 24, High-street, and forming part of the same estate, and were proposing to erect thereon certain buildings which as Harrow alleged would obstruct the access of light hitherto enjoyed by his premises. He accordingly brought an action to restrain the company from building so as to obstruct his light. The proposed buildings had been approved by the surveyor of the Howard de Walden estate. Under these circumstances White, who, it appeared, was also interested in the company, took proceedings to restrain Harrow from prosecuting his action, on the ground that it constituted a breach of the above-mentioned covenant; she now moved under Section 24, Sub-Section 5 of the Judicature Act, 1873, for a stay of proceedings in that action. Mr. Justice Joyce came to the conclusion that the covenant was a covenant which precluded the lessee from raising objection to any building works on the adjoining premises which might have been so sanctioned. His lordship thought, therefore, that White would before the Act have been entitled to an injunction restraining the action. That being so, having regard to Section 24, his lordship thought that White was entitled to have the proceedings stayed, and he made an order to that effect accordingly. The case came before the Court of Appeal, and their lordships allowed the appeal. Lord Justice Vaughan Williams said he thought that "adjoining" meant "adjoining" in the sense in which the word was used in the London Building Act, 1894. A narrower meaning must be put on the word "adjoining." His lordship's opinion was that in this covenant "adjoining" was used in the sense of "in physical contact with," and the Court ought not to construe a covenant as giving a lessor the power to derogate from his own part if the words were fairly capable of another construction. This case has since, I believe, been settled by the parties without further aid from the Courts.

In the foregoing paper I have endeavoured, very imperfectly I know, to set out some of the guiding principles on this difficult subject, but I can imagine your remark, "Well, a number of cases have been quoted, but how have they helped us at all to advise in the cases which daily come before us?" I know too well how often papers on technical matters leave that point unsettled. I will, however, make the following remarks on the practical side:—

1. Never advise on a light and air case from drawings alone. Make a golden rule always to make a most careful inspection of the premises. So many points arise as to the relation on plan of one building to the other, the limitations of the light already received, the height and position of adjacent properties, &c.

2. Make your inspection with the greatest care regarding details—as it is absolutely necessary to have them in your mind if you are giving evidence at a trial. I once heard a surveyor admit in cross-examination that he was not sure if the blind was up or down when he was testing the alleged loss of light to his client's ancient light.

3. If you are acting for the building owner do not endeavour to keep from any objectors the general lines of your new building regarding its position or plan, or its height—you do no good by such a course, and may do great harm.

4. If you are gaining any advantage for your client's building by taking something from his neighbour, give the neighbour some fair cross arrangement to aid him in the future if such a course is practicable. You must always remember you have to erect the new building—the neighbour is indifferent as to whether it proceeds or not—and your client looks to you to erect his new premises, and to

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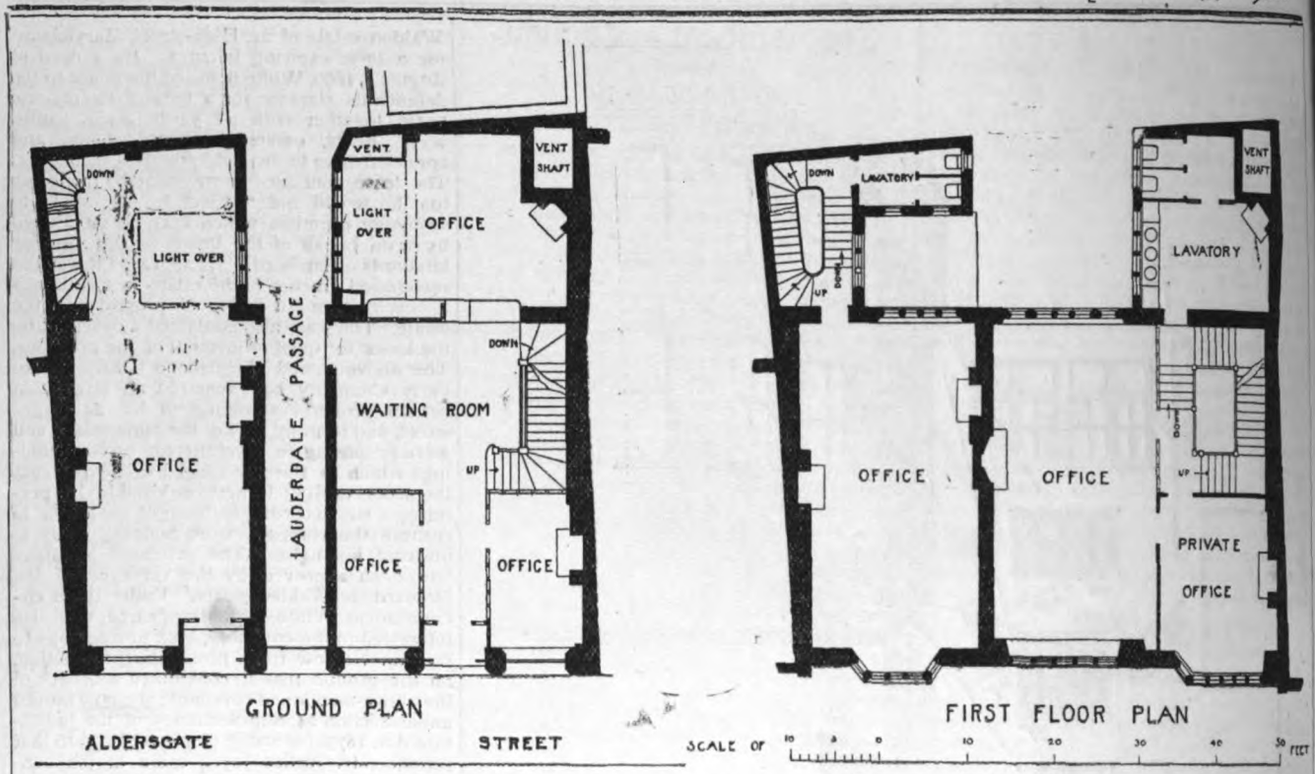


Offices, Aldersgate-street.

keep him out of lawsuits if by any reasonable means you can do so.

5. If you are driven to a fight—and no arrangements are possible—pursue the matter as one of business solely and do not make it a personal one with your adversary—for such it is not.

6. The use of models in light and air cases has, of recent years, largely increased. If the action is going to be fought out in the Court of Chancery, a strong model well made to scale is, I think, a great aid to all parties concerned, and is helpful to counsel in placing his case before the Judge, as well as to witnesses in further explanation of their evidence. However, if you are defendant it is not always wise to produce a model yourself. And in such a case you need have no fear that the Court will be unaided by the plaintiff.

I have on the screen beside me some diagrams which illustrate some of the typical problems which arise.

The diagrams marked Fig. 1 and Fig. 2 were used in a case against the new buildings of the Star Life Office in Bristol. The diagram fig. 1 shows that without taking into consideration any increased vertical interference, there was a serious horizontal diminution of the access of light to the plaintiff's windows. The diagram fig. 2 shows the elevation of the same and the obstruction caused by the vertical additions put to the Star Office buildings. This is drawn in a pictorial manner, but is correctly delineated and to scale. Fig. 1 is a convincing and strong statement of the facts of the case, and I recommend this method in similar cases.

Illustrations.

DESIGN FOR A ROYAL MEMORIAL CHAPEL.

THIS design was submitted in competition for the Tite prize of the present year. The plan which was set by the Institute made the design a very attractive one to work out.

The three drawings here illustrated do not require explanation, though a word regarding the style chosen may perhaps be permissible, as the design was adversely criticised in this respect. The prize is offered for the study of Italian architecture, and there was no word in the conditions of the competition referring to any special period, or of Tite's preference for a particular period of the Renaissance. The order employed throughout is that of Vignola. Marble seemed the material proper to a Royal chapel, and this material suggested the panelled surface treatment used by the Italians at the time that Leonardo da Vinci designed the plan which the Institute chose for the subject of design.

The official criticism of the student's work refers to the plan as being the work of Palladio, which, I believe, is incorrect.

W. CURTIS GREEN.

*** The plan was from one of Leonardo da Vinci's sketch books.—ED.

STAIRCASE AND CHAPEL, ITALIAN HOSPITAL.

THE staircase is built of red brick, the chapel of Monk's Park stone, and the dome covered with 8 lb. lead. This staircase is semicircular on plan, and the chapel on top grows naturally out of the plan. The work was executed by Messrs. Holloway Brothers, of Belvedere-road, Lambeth.

The architect is Mr. T. W. Cutler, and the drawing was exhibited at the last Royal Academy.

OFFICES, ALDERSGATE-STREET.

THESE plans explain themselves. The building on the right of Lauderdale-passage is occupied by Mr. H. C. Stephens (for whom the block was erected), and the building on the left of the archway is to be let as a bank or offices.

The front facing Aldersgate-street, shown in the illustration, is built on the ground floor with granite, the upper part with Edwards' Ruabon thin red bricks and Portland stone. The roofs are covered with Westmorland green slates. The back portion is faced with white glazed bricks and Portland stone dressings.

The floors are of teak, and the whole of the interior is fitted up in teak and mahogany, the stairs being of solid teak so as to be fire-resisting. The whole of the furniture in the building has been specially designed by the architects, and is also in teak.

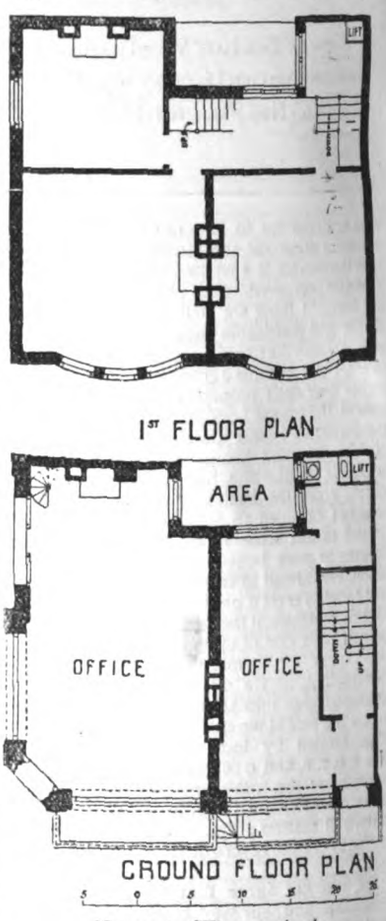
The rooms and staircases have Belgian antique marble dados. Great care has been taken to make the heating and ventilation satisfactory, and the building as far as possible fire-resisting.

The building has been fitted with fire mains and hydrants throughout by Messrs. Merryweather & Co., and a gallery has been constructed at the ridge of the roof so that firemen can command both this and the adjoining buildings.

The architects are Messrs. Crickmay & Sons, and the builders Messrs. E. Laurence & Sons.

NOS. 8 AND 10, WIGMORE-STREET.

THESE premises were erected by Mr. George R. Shaw, builder, to provide offices on the ground floor with a residence above for himself, part of the ground floor being arranged



Houses in Wigmore-street.

for separate occupation. The materials used were Lawrence's bricks and brown Portland stone, the circular bay windows being in rubbed and gauged work.

Mr. F. M. Elgood is the architect.

SURVEYORS' INSTITUTION.—In our report last week of the discussion on Mr. Bedell's paper on "The Insurance of Buildings against Fire," the remarks attributed to "Mr. Howard" were, we are informed, by Mr. Philip F. Brooks.

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ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION.—A large party of the members of the Edinburgh Architectural Association travelled to Glasgow on the 22nd ult., and, under the auspices and leadership of the Glasgow Architectural Association, inspected a number of recently-erected buildings. The programme was arranged by the President of the Glasgow Association, and among the buildings visited were the Mercantile Chambers, Bothwell-street (Messrs. James Salmon & Son, architects); Waterloo Chambers, Waterloo-street (Messrs. J. Burnet & Son, architects); Savings Bank, Ingram-street (Messrs. J. Burnet & Son, architects); School of Art, Renfrew-street (Messrs. Honeyman & Keppie, architects; Belmont Church (Mr. James Millar, architect); and Stevenson Memorial Church (Mr. John J. Stevenson, London, architect). Several private residences were also visited. At the close of the afternoon's proceedings the company dined together in the Lansdowne Restaurant. Mr. Charles E. Whitelaw, President of the Glasgow Association, was in the chair, and Mr. Henry F. Kerr, President of the Edinburgh Association, was also present.

COMPETITIONS.

CLUB HOUSE, LOWESTOFT.—The first premiated design in this competition was that submitted by Messrs. G. J. & F. W. Skipper, London-street, Norwich. The second premiated design was by Mr. H. W. Cotman, 133, Amesbury-avenue, Streatham Hill; and the third design by Messrs. Bisshopp & Cantley, Museum-street, Ipswich.

Correspondence.

BUILDING CONTRACTS.

SIR,—In reply to "Country Architect" I would advise him to ignore legality and do to others as he would have others do to him. The fact that the builder's men worked overtime is sufficient to prove that he was anxious to complete within the time agreed. Builders have quite enough difficulties to contend with without the "time" clause being put into operation for non-completion. I should judge in this case, as in some works I have carried out, that reasonable time was not allowed to carry out the work, and the contractor is to blame for signing such a contract agreement; but, as in pricing out items in bills of quantities, "risk it" is sometimes inserted, so, I presume, the contractor risked it. It is now the opportunity for "Country Architect" to show his clemency.

FREDK. TAYLOR (Builder's Manager).

STANDS TO VIEW THE CORONATION PROCESSION.

SIR,—I wish to suggest that stands covering open spaces of large area would be safer and cheaper constructed partially of steel, viz., rolled joist, which could be used afterwards, there being no necessity for holes being drilled or other damaging treatment. Seats could be well constructed 30 ft. long without any intermediate supports by using deep-webbed tees, with planks 1½ in. or 2 in. thick, 11 in. wide; there would be no question of danger of such a structure giving way.

AN ENGINEER.

THE SMALL DWELLINGS ACQUISITION COMPANY.—Mr. Sydney W. Cranfield is appointed architect and surveyor to a limited company which it is proposed to establish for the purpose of assisting purchasers to obtain loans from the local authorities where the Small Dwellings Acquisition Act of 1899 has been adopted, as well as of providing sanitary and well-built dwellings suitable for labourers, artisans, clerks, &c, and enabling tenants to become owners of their dwellings at reasonable prices, to be payable in instalments not generally exceeding the rent payable to a landlord. The directors (of whom Sir Thomas Wrightson, Bart, M.P., is chairman) have under their consideration the purchase of sites, mostly in the suburbs of London, and will extend their operations to the provinces. The Act of 1899 empowers any local authority, on conditions, to lend an occupant four-fifths of the market value of the house to the extent of 300*l.* in the case of a freehold or a leasehold interest with ninety-nine years unexpired, and for a term, of the advance, which must not exceed thirty years at a rate of interest that must not exceed by 10*s.* per cent. the rate at which the local authority can at the time borrow from the Public Works Loan Commissioners. The charge to the borrower is estimated to amount to not more than 3*l.* 15*s.* per cent. yearly.

The Student's Column.

PART II.—DRAINAGE.

CHAPTER 12.—DISCONNEXION.

DISCONNECTING traps are placed at the inlets of drains (with certain exceptions), in order to prevent aërial communication between the drains and waste-pipes, and to prevent drain-air from being discharged in close proximity to the building. The Model By-laws (both Urban and Rural) specify that every person who shall erect a new building "shall cause every inlet to any drain, not being an inlet provided in pursuance of the by-law in that behalf as an opening for the ventilation of such drain, to be properly trapped." This is amplified in the new London Drainage By-laws by the addition of the following words—"by an efficient trap so constructed as to be capable of maintaining a sufficient water seal; he shall not construct or fix in or in connexion with any such drain any trap of the kind known as a bell-trap, a dip-trap, or a D-trap."

The bell, dip, and D traps have been so often condemned that it is unnecessary to describe them in detail. The depth of seal should be from 2 in. to 3 in., and the body of the trap should be formed with easy curves in order to prevent deposits. The volume of standing water should be reduced to the smallest possible amount consistent with an efficient seal. As a general rule disconnecting traps are simply modifications of the P and S traps, but the inlets vary according to the purposes they have to serve. A convenient classification is—(1) Surface-water gullies, and (2) Waste-water gullies.

1. *Surface-water Gullies.*—These include gullies for the reception of the discharges from rainwater pipes, and for the drainage of areas, yards, paths, &c. The Model By-laws do not contain any special provisions regarding drains from rainwater pipes, but the London By-laws specify that every such pipe or channel shall be made "to discharge in the open air over a properly-trapped gully or into such gully above the level of the water in the trap thereof." The simplest and cheapest type of gully (fig. 48) consists of a P or S trap, surmounted by a dish into which an iron grate is loosely fitted; the rainwater pipe discharges directly over the dish. The disadvantages of this arrangement are the splashing of the water, and the overflow of the water when the grate is choked with leaves, &c. Hence the modification shown in fig. 49, in which a 3-in. or 4-in. socket A is provided for the rainwater pipe, so that the water is discharged into the trap below the grating. This gully is also made with an additional side connexion as shown by the dotted lines at B. It is a disadvantage that the outlet of the trap cannot be turned in any direction without fixing the grate askew, but this difficulty is easily overcome by making the trap itself in a separate piece, with a socket joint between it and the inlet piece, as shown in fig. 50. In many cases the number of traps may be reduced by fixing simple shoes (somewhat similar to the upper part of fig. 50, but with the outlet horizontal instead of vertical) at the feet of the rainwater pipes, and laying drain-pipes from these to a trap placed in a convenient position under a yard gulley or inspection-shaft. Thus, in fig. 51, the three rainwater pipes R R R may be drained to a single trap under the yard gully G. Winser's disconnector for this arrangement is shown in fig. 52. The junction piece is made with one, two, three, or four inlets, either 2 in. or 4 in. in diameter.

Stoke's gully-trap, of which a sectional view is given in fig. 53, has an access arm (with air-tight cover and stopper) for clearing the drain. The illustration shows the simplest type with grated inlet only, but other inlets can be provided by means of socketed junctions at the back and sides; the inlet portion is also made in a separate piece, so that the trap can be turned in any direction. Winser's access gully (fig. 54) is simple and convenient; the clearing arm cap is of brass, screwed into a brass socket, which is cemented to the gully. Doulton's "Lambeth" and "Universal" gullies are on similar lines, the former having a galvanised iron cover to the clearing arm, fixed with gun-metal screws, and the latter having a stoneware stopper with Stanford joint; both gullies are also made with bends for rainwater pipes, as shown at A in fig. 49.

For garden paths and other places where there is a considerable amount of detritus, silt gullies may be advantageously used in order to prevent sand and gravel entering the drains. These gullies are often provided with a galvanised iron bucket to facilitate the removal of deposits, and may be trapped as shown in fig. 55, or (if the separate system of drainage is adopted, or if two or more gullies are drained to a single trap in the manner illustrated in fig. 51), may be made without trap as shown by the dotted lines at A. Side inlets can also be formed in the upper part of a trapped gully to receive the drainage from an untrapped rainwater pipe or an untrapped gully.

2. *Waste-water Gullies.*—These are intended to prevent foul drain-air from entering buildings, either by way of waste-pipes or of doors or windows. It is a cardinal rule that all inlets to drains should be outside the building. The Model By-laws make an exception in the case of water-closets and slop-sinks, but the exception is verbal rather than real, as the soil-pipes must be external. The London Drainage By-laws except water-closets, slop-sinks, and urinals. The waste-pipes from baths, lavatories, and sinks (other than slop-sinks) must, according to the Urban Model By-laws, be made to "discharge in the open air over a channel leading to a trapped gully grating at least 18 in. distant." The same provision is made for the discharges from the overflow pipes of cisterns and of safes under sanitary fittings and "from every pipe in such buildings for carrying off waste water." This by-law, although appearing in the re-issue of 1899, is out of date; overflow pipes ought not to be carried down to a gully, but ought simply to be carried through the nearest wall at as high a level as convenient, the open ends being protected by flaps. The Rural By-law on this subject is more satisfactory: A person who shall erect a new building "shall cause the waste-pipe from every bath, sink (not being a slop-sink . . . .), or lavatory, and every pipe in such building for carrying off foul waste water to be properly trapped, and to be taken through an external wall of such building, and to discharge in the open air over a channel leading to a trapped gully grating." Note that the length of the channel is not specified, and that the intention appears to be that the waste-pipe must discharge at a higher level than the grating, and not under it. The London By-law allows greater lattitude: A person who shall erect a new building "shall cause every pipe in such building for carrying off waste water to a sewer to be taken through an external wall of such building, and to discharge in the open air over a properly trapped gully, or into such gully above the level of the water in the trap thereof, or over a channel leading to such gully."

The discharge of waste water over a channel at a point at least 18 in. distant from the gulley was formerly advocated on the ground that foul air emanating from the trap might otherwise pass directly through the waste-pipe into the building, but if the waste-pipe is properly trapped (as it ought to be), aerial communication between the external gulley and the interior of the building is almost impossible. Channels are also objectionable, as, unless they are of special design, they are easily choked with leaves, grease, &c., and in frosty weather the discharges congeal in them and block the entrance to the gulley. The dish and trap shown in fig. 48 are often used for receiving waste water from baths, lavatories, and sinks, but the dish is generally too shallow to prevent the overflow of rapid discharges, and it is, therefore, a good plan to set the dish from 3 in. to 6 in. below the surrounding paving and to form a cemented slope around it, or to fix a raised stone or cement curb around the dish. Gullies of the types shown in figs. 49, 50, 53, and 54 are also used for waste water.

The plan of connecting two or more short untrapped drains to a single trap, as shown in fig. 51, may also be advantageously adopted for foul waste water as well as for rain-water. Fig. 56 shows a cast-iron gully-bottom of this kind with stoneware junction pieces above. The traps are made with P or Q outgo; 4-in. traps are made with 4-in., 6-in., 9-in., or 12-in. inlets, and 5-in. and 6-in. traps with 6-in., 9-in., or 12-in. inlets. The clearing arm A is continued to the surface and finished with an air-tight cover.

Duckett's modified form of channel gulley (fig. 57) has a special nozzle to prevent damage to the end of the waste-pipe. Sykes's channel or slipper is made with one or more inlets at a distance of 18 in. from the trap; the variety

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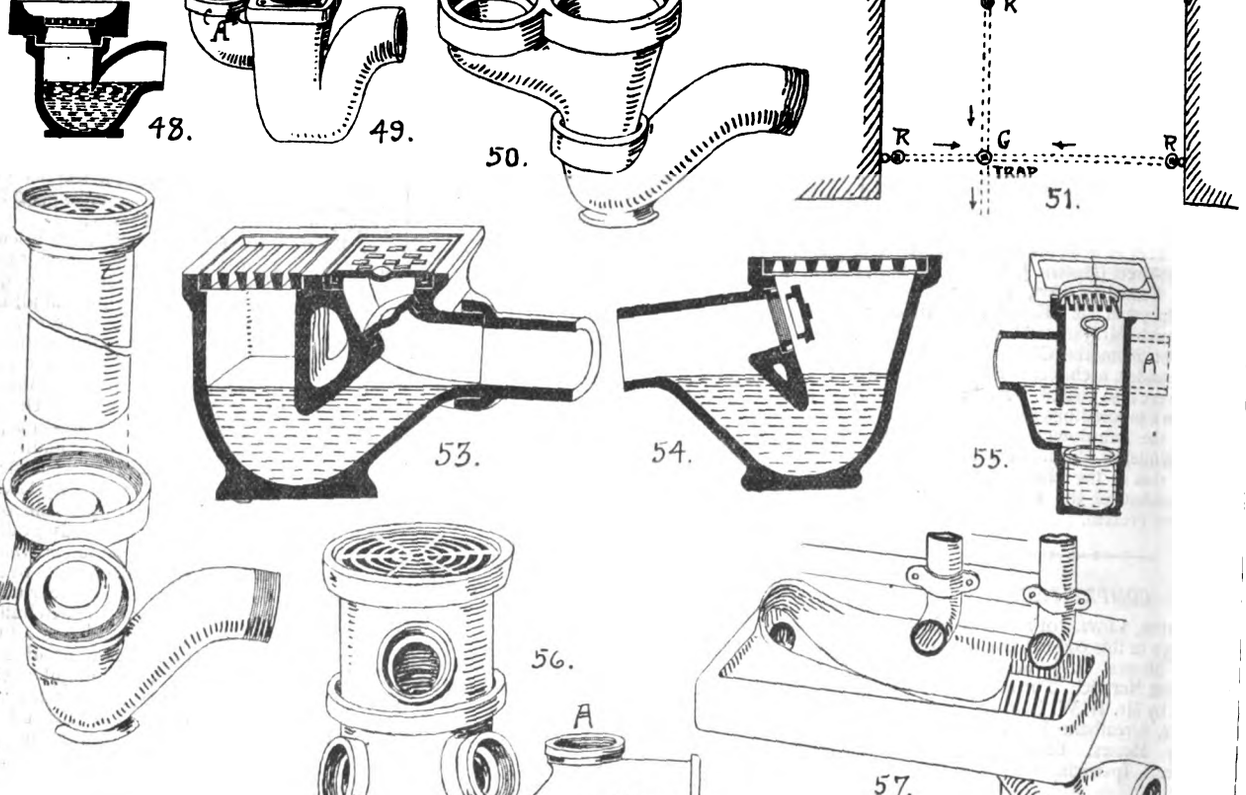

illustrated in fig. 58 has three inlets, for bath-waste, sink-waste, and rain-water pipe respectively. The channel A (of which a transverse section is shown at B) is covered with a grating to prevent the access of leaves, and the discharges from the bath and rain-water pipes serve to break up any grease from the sink which may collect in the trap and to carry it forward into the drain.

For kitchen sinks in large houses, hotels, and other buildings where much cooking is done, grease traps or gullies are often used. At one time it was a common practice to adopt a trap containing a large volume of water and a number of compartments, in order that the grease might be congealed and retained in the trap; the grease floats on the water, and is periodically removed. The trap shown in fig. 55 is also used for this purpose. Traps of these kinds often become a nuisance, as servants neglect to remove the grease, but if they are properly attended to they may be used with advantage in systems where the sewage must be privately treated, as grease interferes to a considerable extent with processes of purification. Under other circumstances, it is much better to adopt a trap of more ordinary shape, with some kind of flushing apparatus. Bowes-Scott & Western's automatic flushing grease-trap contains a large volume of water for congealing the grease, and has two side inlets for sink wastes. An automatic flushing tank is fixed 6 ft. above the grid, and is connected with it by a 3-in. pipe. Solidified grease collected in the trap is broken up by the periodical flushes and carried through the drain. Other wastes and rain-water pipes may, of course, discharge into or over this trap.

A flushing-cistern of this kind must, of course, be fed with clean water, and where this is scarce, the sewage itself may advantageously be utilised to give the necessary flush; this can be done by making the sink waste discharge over a Duckett's "tipper" or "tumbler," containing from five to ten gallons or more; when the waste water reaches a certain level the tumbler is overbalanced, and discharges its contents through the trap with considerable velocity. Any grease which has solidified in the trap is thus broken up and flushed through the drain.

For the drainage of cellars different plans may be adopted. An iron pipe may be laid through the external wall to discharge over a trapped gully in the area outside, the invert of the pipe being level with the bottom of a dish formed in the floor. A grate can be fixed in the socket of the pipe to prevent the ingress of rats and other animals; or a trapped gully may be fixed in the floor and a drain carried thence to discharge over a trapped gully in an external area. Or, if there is no area, the drain must either discharge over an intercepting trap with an air-shaft carried to the surface of the ground after the manner shown in figs. 40 and 41, or into a ventilated intercepting chamber of the kind illustrated in fig. 43.

Soil-pipes from water-closets are usually connected to drains by means of simple bends with foot-rests supported on flags or concrete. The "loco" bend for this position has been illustrated in fig. 33 Traps at the feet of soil-pipes are not allowed by the Model By-laws or by the London By-laws. The untrapped soil-pipe serves the purpose of a drain-ventilator, and it is a mistake to trap such a pipe; drains cannot be too well ventilated. The Rural Model By-laws specify that the waste-pipes from slop-sinks must be treated as soil-pipes, and the London By-laws apply the same rule to the waste-pipes from slop-sinks and urinals.

GENERAL BUILDING NEWS.

PRIMITIVE METHODIST CHURCH, PEMBERTON, LANCASHIRE.—New church and schools for the Primitive Methodists have been opened at Pemberton. The buildings have been erected in Woodford-street, off Ormskirk-road, Lamberhead-Green. Owing to the shape of the land the church and schools are detached. The church is 27 ft. from the street, and has two entrances, each with double vestibule. Two aisles divide the pews, and the floor is made sloping down to the rostrum. At the end of the church is placed the choir gallery, with the minister's vestry on each side. In front is the rostrum and communion table. Interior woodwork is of pitchpine. The school has two entrance from Woodford-street, and the infants' room has an extra door from a side-street. At each end of the large schoolroom are three classrooms; one set of these is partitioned off by revolving shutters, and may, when required, be thrown open to the main room. The school is provided with a platform and the infants' room with a gallery. There is also a room fitted as a kitchen. There is seating in the church for 500, and the school accommodates 400. The buildings are of brick and stone, faced with pressed bricks. The church and school throughout are warmed with hot-water pipes and radiators; the infants' room, classrooms and vestries having fireplaces in addition. Both church and school are fitted throughout with electric light. The contractors are Messrs. Walter Hirst & Son, of Wigan, who have carried out the work under the personal supervision of the architect, Mr. Richard Pennington.

CHURCH, TONYREFAIL, GLAMORGANSHIRE.—The foundation-stone of the new Church of St. David's, Tonyrefail, was laid recently by the Bishop of Llandaff. The contract for the erection of the church has been let to Messrs. C. Beames & Nephew, Cardiff. The architect is Mr. Bruce Vaughan. The church is designed to seat 359 people. It will consist of a nave 65 ft. long by 25 ft. 8 in. wide, with a north aisle 65 ft. long by 11 ft. 8 in. wide, divided from the nave by a stone arcade. The chancel is 34 ft. long

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by 25 ft. wide, vestry 13 ft. by 18 ft., and organ-chamber and choir-vestry 18ft. by 18 ft. The church is to be built of stone. The chancel has a five-light window in the east gable, and the principal feature of the west gable is a stone bell cote carried on a central buttress. The roofs will be covered with green slates. It is hoped, if funds will admit, to line the church walls internally with brickwork. The roof of the nave is to be open to the apex, with pitch-pine timbers unvarnished. The chancel, which is divided from the nave by a moulded stone arch, will be roofed with a pitch-pine panelled ceiling and moulded ribs.

WESLEYAN CHURCH, WALLSEND.—A new Wesleyan church erected at the corner of Laburnum-avenue and High-street East, Wallsend, was opened on the 31st ult. It has been built by Mr. Macharg, contractor, from designs prepared by Mr. J. Walton Taylor, architect, of Newcastle. The total cost of the undertaking is 6,500*l.* In the church there is seating accommodation for about 800 persons. The pews and all the woodwork of the interior is of pitch-pine, the rostrum, communion table, and chairs and baptismal font being the gift of the members of the church. The building is lighted throughout by electricity.

PRIMITIVE METHODIST CHURCH AND SCHOOLS, MARLEY HILL, DURHAM.—On the 31st ult. the foundation-stones for a new Primitive Methodist church and schools to be erected at Marley Hill, in the Burnopfield circuit, were laid. The projected structure is a stone building, consisting of the main vestibule, lecture hall, two classrooms, and a minister's vestry. The plans for the building have been prepared by Mr. T. E. Davidson, architect, Newcastle, and the contract let to Messrs. A. & R. Davis, of Burnopfield.

SCHOOLS, LEYTON.—The memorial stone has just been laid of new schools at the rear of the County Cricket Ground, Leyton. The site comprises an area of about two acres, with the principal frontage to Farmer-road and a shorter frontage of about 80 ft. to Brewster-road. The schools are designed to accommodate:—On the ground floor, 532 infants; on the first floor, 480 girls; on the second floor, 480 boys; giving a total of 1,492 school places. The infants' department has ten classrooms, two rooms being specially set apart for the younger children. The boys' and girls' departments each have eight classrooms. The contract for the works amounts to 24,761*l.*, and is being carried out by Mr. F. J. Coxhead to the designs and under the supervision of Mr. William Jacques, the Board's architect.

CLUB, KIRKCALDY.—The Old Philp's School in Thistle-street, Kirkcaldy, has been converted into a club for the Kirkcaldy Burgh Unionist Association. The architects were Messrs. Williamson & Inglis, Kirkcaldy; the contractors being: builders, Messrs. Alexander Fraser & Son, Pathhead; joiner, Mr. David Wishart, Pathhead; painter, Mr. A. Simpson, Kirkcaldy; plumbers, Messrs. A. M'Connochie & Son, Kirkcaldy; heating apparatus, Messrs. Meikle & Philip, Edinburgh; plaster work, Messrs. J. Easton & Son, Kirkcaldy; glaziers, Messrs. J. Haxton & Co., Kirkcaldy.

HOUSING, BRIDE'S-ALLEY AREA, DUBLIN.—The first contract in connexion with the improvement in Bride's-alley area has now been completed by Mr. Donovan. In this contract there are nine blocks, containing seventy-two separate dwellings. Sixteen of these dwellings are two-roomed, and the remainder three-roomed, and it is expected that the latter will let at from 5s. to 6s. per week, and the two-roomed dwellings at from 3s. to 4s. per week. Contract No. 2 consists of a number of blocks containing sixty-six separate dwellings. These dwellings will face on the new street which will be formed running from Bride-street to Nicholas-street. This contract is now far advanced, the walls being completed and the buildings roofed, and they will be ready for occupation about June next. The third Corporation contract in this direction has been temporarily suspended. This will consist of nine blocks, containing seventy-two further dwellings, and which will face the new street which separates the Bride's-alley area from the Bull-alley area. The plans are all provided by Mr. C. J. MacCarthy, City Architect. The dwellings which are now being erected in the Bull-alley area, through the munificence of Lord Iveagh, for the accommodation of artisans and their families, have been recently commenced, the contract being in the hands of Mr. Bolton, of Rathmines. The scheme includes, besides the dwellings proper, a model lodging-house on the plan of Lord Rowton's London houses of that class.

CHURCH, SHERFIELD ENGLISH, HAMPSHIRE.—Mr. F. Bath, of Salisbury, has been appointed architect for the rebuilding of the parish church of St. Leonard at Sherfield English, near Romsey, for Louisa, Lady Ashburton, who is patroness of the living. The present church was erected in 1857-8, on a site by the high road to Salisbury, in place of the former church, which of late years has fallen into decay, some little distance northwards, near the old manor-house.

WORKHOUSE, BARTON REGIS UNION, WESTBURY-ON-TRYM, BRISTOL.—On the 25th ult. the business offices of the Barton Regis Guardians were opened at the new offices adjoining the Workhouse, Southmead, Westbury-on-Trym. The extension of the city boundaries made it desirable for the Guardians to provide a new workhouse and offices, and so it came about that a site of 13½ acres was secured by the Guardians at Southmead, where the work of the main building is now going on under the direction of the contractor, Mr. H. A. Forse. The work of the new offices has been pushed on and completed, but it is not anticipated that the workhouse proper will be ready for the reception of inmates until the end of July. The cost of the site was 3,700*l.*, and the outlay for the new building, furnishing, and machinery will amount to 29,000*l.* As regards the new workhouse, the buildings are divided into five main blocks, and the architects are Mr. A. P. I. Cotterell, Bristol, and Mr. W. H. Thorpe, of Leeds. The first block (A) comprises the boardroom, 26 ft. by 24 ft. in dimensions, and the clerk's offices. This block is distinct from the workhouse buildings, and is situate to the left of the main entrance, and a separate entrance is provided for persons having business with the clerk. Block B consists of the porter's lodge, and the male and female tramp wards, providing accommodation for sixteen males and eight females. At the rear of these premises is the stone-yard. Block C consists of the master and matron's apartments, and accommodation for eighty-two inmates. This section of the workhouse is arranged on the pavilion system. To the rear of the master's rooms there are a number of storerooms, and an inmates' dining-hall, 40 ft. by 26 ft. Provision is made for the women inmates on the right side of Block C, and for the men inmates on the reverse side. Quarters are also supplied in this section for two married couples, and at the rear there is a laundry, carpenter's and shoemaker's shops, and a boiler-house. The infirmary is comprised in Block D, provision being made for twenty-four patients, viz., twelve male and twelve female. On either side of the corridor there are three wards, which will afford the means of dealing with doubtful cases. Ample provision is made for the medical men and the nurses, and at the end of the corridor, and reached by a covered way, are two rooms for maternity cases. The mortuary and stables are comprised in Block E. A boundary wall, nearly half a mile in length, surrounds the new workhouse. It is not proposed to keep any children at the new workhouse. Two cottage homes have been acquired for some of them half a mile away from the union, and others will probably be housed out. The total accommodation of the new building is for 110 inmates and twenty-four casuals.—*Bristol Times.*

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. F. G. Knight, architect, has removed his office from 6, Great College-street to 13, Victoria-street, Westminster, S.W.——Messrs. H. Young & Co., engineers, founders and contractors, have removed from Eccleston Iron-Works, Pimlico, to Nine Elms Ironworks, S.W.——Mr. Augustus E. Hughes, architect, 28, Mortimer-street, W., has taken his son into partnership, and the practice will be carried on under the style of Augustus E. Hughes & Son. ——Mr. A. E. Mullins, architect and surveyor, has removed his offices from 16, Church-street, Camberwell Green, to 48, Peckham-road, S.E.——Messrs. Watts Johnson & Co., builders and contractors, have removed from St. Anne's Wharf, Commercial-road, to Burdett and Liddiard Wharves, Thomas-street, Burdett-road, E.

LOWESTOFT ELECTRIC LIGHTING.—The Lowestoft Town Council having made application to the Local Government Board for sanction to borrow sums amounting to 7,143*l.* for the purposes of electric lighting, &c., an enquiry was held at the Town-hall recently by Mr. J. C. Pottinger, M.Inst.C.E. Mr. G. A. Bruce, the resident electrical engineer, explained to the inspector that they had at present 10,400 eight-candle power lamps, and applications were coming in for nearly 1,700 more. No incandescent lamps were included in the present application. The present charge for electricity was 7d. and 3d. per unit for lighting and 7d. and 1½d. for power. Mr. W. J. Roberts, the architect, having answered several questions relative to the buildings, the inquiry closed.

READING AND DISTRICT BUILDING TRADES MASTERS' ASSOCIATION.—The third annual dinner of this Association was held at the Queen's Hotel, Reading, recently, Mr. J. T. Bottrill presiding. The Chairman proposed the loyal toast, which was duly honoured. Mr. H. A. Lewis submitted "The Architects and Surveyors." With regard to the Municipal Buildings scheme, he deprecated the giving of the commission of 100 gs. to an outside architect, as he believed they had architects in Reading who were equally capable of developing the scheme.—Mr. W. R. Howell, in responding, expressed pleasure at the good feeling existing in Reading amongst the architects and their fellow men in the craft. During his short experience in the town he had seen very great developments, not only in the quality of the architecture, but also in the quality of the building. When the history of Reading at the beginning of this century was written, the verdict, on the whole, would be a favourable one, but in one or two instances, he thought, they would be blamed. It was not for him to apportion the blame to any one, but fifty years hence people would wonder what the people of Reading were doing when they allowed the improvement of Queen Victoria-street to be carried out in such a splendid way, yet with the fatal blot of being too narrow. Another matter that future historians would blame the present age about was the old question of overcrowding. One had only to walk along the Tilehurst-road and look down upon the sea of houses on the Elm Park estate. Many people blamed that wicked man "the speculative builder" for the overcrowding, but he (Mr. Howell) would blame the system under which they lived. The chief cause was the want of locomotion and privacy. Within the next fifty years they would get vastly improved means of locomotion, which would allow "the speculative builder" to erect houses far away from the centre of the town. He also thought that the chief means of locomotion would take the form of motor-cars rather than trams. As to the municipal buildings, many people thought the architects of Reading had been hardly dealt with, but seeing that many of them got more than half their practice outside the town they could not complain about an outsider coming to the town. The logical conclusion to the argument was that if they objected to outsiders the architects of Reading would have to confine their work to the town.—Mr. J. Catley gave the "Town and Trade of Reading," Mr. Barnard Messer replying. The Mayor (Mr. A. H. Bull) proposed the toast of the evening, "The Association." From the report of the Association he gathered that they were banded together to protect their own interests, and also the interests of their customers and the welfare of the men they employed. The more employers combined the better it was for those whom they employed; in fact, it was better for both sides to be combined, with proper organisation, so that they could meet each other and discuss any questions of difference that might arise. He believed they had established a Conciliatory Board, so that before any strike took place in connection with the building trade they could jointly discuss the matter before the men took any definite action.—Mr. G. S. Lewis, in responding, said the Association was formed three or four years ago, and was for employers of labour in the building and kindred trades. The object was to meet together and discuss with the men any disputes, and to have arbitration. When he looked back a few years, it was surprising to him how they got on before the Association was formed. Since it had been formed, they had done some useful work. From time to time, as occasion required, they met the men's representatives, and matters had been amicably arranged. He was very pleased that the depression so general last year over England, more especially in the North, did not touch this part of the country. If the depression had come here he would have been in favour of weeding out the inferior workmen, instead of decreasing the wages all round. If they decreased the wages they took the heart away from a man, and he could not go on with his work with the same earnestness. The weeding out of the inferior workmen had been done in the north, and had proved a great boon to the trade. The Association had also tried to get fair contracts. This year they approached the Corporation on an unfair contract sent out for the electric tramway generating station. He was very sorry they were not successful in getting it altered. Had the contract been sent out in a reasonable way undoubtedly a Reading builder would have had the job. The Chairman proposed "The Visitors," for whom Mr. Williams responded.

DAVID LEWIS NORTHERN HOSPITAL.—Messrs. Pennington & Son write to say that Mr. C. W. Harvey, whose name was given in our columns as architect for the above hospital, is the resident architect superintending the building on their behalf, the working drawings and details having been prepared by Messrs. Pennington & Son in their own office.

BARIUM HYDRATE FOR THE MANUFACTURE OF PIGMENTS.—Barium hydrate has hitherto been too costly for general use in the manufacture of pigments, but the sulphate of barium, known to commerce under the name "barytes," has been used as a pigment from time immemorial. Barytes is an insoluble compound of barium, which is found abundantly distributed in different parts of the world, and simply requires grinding and washing to convert it into a saleable pigment. Barium hydrate is a soluble compound of barium which is manufactured from the insoluble barytes. In a paper recently communicated to the New York Section of the Society of Chemical Industry Mr. Charles Jacobs describes a new process which has been adopted by the United Barium Co., of Niagara, by which barium hydrate is produced in an almost pure condition at a much lower cost than has hitherto been possible. The process consists in heating a mixture of coke and barytes in an electric furnace, whereby a mixture of oxide and sulphide of barium is produced. The material removed from the furnace is dissolved in hot water, and the insoluble impurities are removed by filtration. The filtrate consists of a solution of barium hydrate containing a small proportion of barium sulphydrate. From this solution almost pure barium hydrate is obtained by crystallisation. The barium hydrate is largely used in many industrial processes. Its value for the manufacture of pigments is due to its strong affinity for the sulphuric acid of soluble sulphates, and with certain

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sulphates a precipitate of insoluble hydrates with barium sulphate in intimate molecular mixture is produced. It is claimed that by a reaction of this description a permanent white pigment has been produced which is superior to zinc white or barium sulphate in its natural or artificial form, and which has the valuable covering powers of white lead without its liability to discoloration by sulphuretted hydrogen. It is stated that although the new process has not yet been working for a year on a commercial scale, it has already been found necessary to increase the manufacturing capacity of the plant to a basis of 60 tons of barium hydrate per day.

TWO THEATRES FOR SALE.—On May 8 will be offered for sale at the Mart, the Ealing Theatre, Lyric Restaurant, and Assembly Rooms, which were erected two or three years ago, after plans and designs by Mr. George Pargeter, in conjunction with Mr. W. Emden as consulting architect for the theatre block, on the site of the old Lyric Theatre in the Broadway. The existing buildings occupy a site of about 20,000 ft. superficial, and the restaurant block comprises a large ballroom, an assembly-room known as the "Perceval Room," a masonic temple, the "Leopold Room," tea-rooms, and so on, which adjoin and extend over the main entrances of the theatre from which they are separated by fireproof floors and partitions. On April 16 will be offered for sale the new Theatre Royal, in St. John's Hill, Shrewsbury, which was reconstructed, with a capacity for nearly 1,000 persons, in 1898, from plans and designs prepared by Mr. John P. Briggs. The property includes three shops and some licensed premises adjoining the theatre.

THE ENCLOSURE OF STONEHENGE.—On the 26th ult. an inquiry was held in the Council Chamber, Salisbury, by the Hon. Percy Wyndham, the Marquis of Bath, and Mr. J. M. F. Fuller, M.P., on behalf of the Wilts County Council, into the enclosure of Stonehenge and the alleged obstruction of public rights of way leading thereto. Mr. Birkett represented the petitioners, the Amesbury Rural District Council; Mr. G. J. Shaw Lefevre appeared on behalf of the Commons and Footpaths Society, the National Trust Fund, the Kyrle Society, and a number of scientific gentlemen who sent a petition to the County Council asking them to vindicate the rights of the public in respect to Stonehenge; and Mr. J. Hammond appeared for the owner of Stonehenge, Sir Edmund Antrobus. Mr. Birkett called a number of witnesses, who stated that from time immemorial the tracks across the Down leading to Stonehenge, which had been obstructed by the wire fence erected by Sir Edmund Antrobus, had been used by the public without interruption of any kind. Mr. Shaw Lefevre said he visited Stonehenge over the tracks described more than fifty years ago, and he did not think anybody could look at the tracks without seeing that they had been used from time immemorial. On the part of the societies he represented he disclaimed any hostility to Sir Edmund Antrobus, who, he thought, had been actuated in what he had done by public motives. He was apparently advised that it was necessary to protect Stonehenge for two reasons. In the first place, it was feared that the sale to the Government of land in the vicinity of Stonehenge would introduce a number of bad characters into the district, and that the stones might be damaged; in the second place, it was thought necessary to effect certain improvements and to replace certain stones in their original position. And, to give further protection, a barbed wire fence was erected around the stones. These things cost Sir Edmund Antrobus considerable expense, and it was to recoup himself that he charged 1s. per head for admission to the stones. Two evils had resulted from his action. The erection of the fence was unsightly, and it had altered the character of the monument and destroyed much of its charm and beauty. The erection of the fence had also interfered with rights of way which had been enjoyed by the public from time immemorial. In his opinion, if Sir Edmund Antrobus was anxious to preserve the monument, he should have placed it under the Ancient Monuments Act. He would have remained the owner still, and the cost of protecting and preserving the monument would have been borne by the State. He ventured to say that Sir Edmund should be reimbursed for the expense he had already been put to on the understanding that the monument was to be placed under the protection of the Act he had referred to.—Mr. Hammond pointed out that for many years Sir Edmund Antrobus and his father before him had employed a custodian to look after Stonehenge, and showed that they had always been regarded as the owners of the stones. He denied that the motive attributed to Sir Edmund Antrobus for the erection of the wire fence was a correct one. It was true that the public had used tracks over the Downs to reach Stonehenge, but it was by Sir Edmund's permission that it was done and not as a public right.—The committee of inquiry will in due course report to the county council.

STONE EXCHANGE, BRADFORD.—The new Exchange premises in Sunbridge-road, Bradford, were opened on the 25th ult., the members of the Bradford Building Trades and Stone Exchange celebrating the occasion with a dinner in the new building. Mr. Julius Whitehead, President, occupied the chair. The loyal toasts having been musically honoured, the Mayor (Mr. W. C. Lupton) declared the new premises open. He referred to the several building trade disputes which had arisen during the past twelve months, and remarked that he was happy to inform his hearers that another of these disputes would be settled in the course of a few days. It was very difficult, he said, to diagnose the position between masters and men in Bradford, but from assurances he had it appeared that the real intention of that institution was not to amalgamate the masters into a union which would operate to the detriment of the men, but, rather, the institution was intended to be a means for the interchange of products, of ideas, and, he hoped, of sympathy one with another. As for himself, as long as he remained in office he meant to do all he could to pour the oil of kindness upon any trade dispute that came before him, and he hoped to perpetuate a better feeling between masters and men than had under certain circumstances existed. He concluded by wishing the institution every success. On the motion of Mr. Whitehead, a vote of thanks was accorded to the Mayor. Mr. Vickers then gave "The Mayor and Corporation of Bradford." The toast was responded to by Alderman O'Flynn and Alderman Crossland. Alderman Holdsworth proposed, and Mr. Watson supported, "Our new Exchange, and the Committee and Secretary." In responding, Mr. Gadie, secretary, referred to the fact that he had resigned his position as secretary to the Bradford Master Builders' Association, which was an office quite distinct from the secretaryship of the Stone Exchange. The latter institution existed purely for the purpose of facilitating business transactions between the various trades connected with the building industry, and had nothing to do with matters which arose between employers and employed. He was pleased to think that before vacating his position as secretary to the master builders the recent dispute had been amicably settled, and that masters and men were now working on the very best terms. Other toasts followed.

A CORRECTION.—Mr. F. W. Macey writes to point out that in reviewing, in our issue of the 22nd ult., his book on "Building Contracts," we omitted a word in a quotation from the book as to the position of the clerk of works—"Heretofore he has always been an educated man." It should have read, "Heretofore he has not always," &c.

A "GARDEN CITY" IN LONDON.—It is stated that the Ecclesiastical Commissioners, as the ground landlords, have decided to deal in quite a novel manner with some property in Lambeth. The site lies within the angle formed by the junction of Webber-street and New-cut, between Waterloo and Blackfriars roads. The Commissioners propose to clear away the houses in two streets that lead from Webber-street into Short-street and to replace them with rows of two-storied cottages, with garden-strips, a children's playground, and open spaces planted with trees. The scheme, if perfected, will be in contrast with the adjacent Peabody-buildings between Webber-row and the Surrey Theatre, and we understand that the Commissioners declined many offers to take a lease of the ground for the erection of industrial dwellings after the ordinary kind.

PROPOSED SCULPTURE GALLERY FOR ABERDEEN.—A meeting of citizens was held in Aberdeen on the 27th ult. in the Town Hall, under the presidency of Lord Provost Fleming, for the purpose of promoting a sculpture museum in connexion with the Aberdeen Art Gallery. Dr. John Forbes White, Dundee, moved:—"That in the best interests of the community of students attending the University, and specially of the great granite industry, it is desirable that a museum be established in connexion with the Art Gallery to contain casts of the finest examples of Classic, Gothic, Italian, and other art; and that this meeting approves of the establishment of such a museum." Dr. White emphasised the influence of such a museum on the young workers in the granite trade. Connected with that industry, he was told, there were nearly one hundred establishments in Aberdeen, where the wages paid were larger than those in any other industry in the city. That showed what an amount of thoughtful labour must be bestowed on the production of works in granite.—Mr. Arthur Taylor, sculptor, seconded. Mr. R. F. Martin having spoken of the advantage that such a gallery would be to all sections in the community, the motion was cordially adopted. Professor Ramsay, D.C.L., Aberdeen University, moved the appointment of a large and influential committee consisting of noblemen and gentlemen in the city and county, to carry out the negotiations, and of a small committee of management, with Mr. James Murray as convener. Professor Ramsay pointed out that Greece attained its high level in artistic productions not because of any special or peculiar genius of the people, but because of the circumstances in which they were placed. They were a great artistic people because they had to buy a great deal, and had no other means of paying for it except in artistic productions. These artistic products were not the work of a great number of great sculptors and painters, but were the work of the ordinary artisans. He thought there was every reason to think that there was an inherent quality in the population of the north-east of Scotland to create such work as he was speaking of. Mr. Arthur Clyne, architect, seconded. After some remarks by Colonel Innes, of Learney, the motion was adopted.

FOUNTAIN, BERMONDSEY.—The Mayor of Bermondsey (Colonel Bevington) recently unveiled the fountain erected in Bermondsey Churchyard to the memory of his father, J. B. Bevington. The fountain, which was constructed by Messrs. Fenning & Co., of Salters-court, Cannon-street, E.C., was designed by Mr. R. J. Angel, the Borough Surveyor. It consists of a Portland stone body set upon a granite base, and surmounted by a canopy, which is supported by polished Scotch granite shafts. Under the centre of the canopy there is a copper bowl, from which springs a jet of water. There are two granite bowls arranged as drinking fountains.

APPOINTMENT.—Mr. Henry Price, chief of the Architectural Department and Surveyor of Buildings to the Birmingham Corporation, was on the 26th ult. recommended by Manchester Town Hall Committee for appointment by the City Council to the newly-created office of City Architect. Mr. Price has been five years in Birmingham, and was prior to that time in Liverpool. There were thirty-nine applicants for the Manchester appointment, and the selected candidates from whom final choice was made included, besides Mr. Price, Mr. George Hutchins, of Higher Broughton, managing assistant to the County Architect of Chester; and Mr. J. H. Swainson, of Egremont, managing assistant to a firm of architects. The Architect will have charge of the Architectural Department, and his commencing salary is to be 600*l.* a year.

THE LABOUR MARKET IN THE COLONIES.—The last quarterly circular of the Emigrants' Information Office (31, Broadway, Westminster) notes that in some parts of Canada there is a demand for miners, navvies, and general labourers. There is a good demand for men in the iron and steel works at Sydney (Cape Breton), Hamilton, Sault St. Marie, and elsewhere; and some demand throughout Canada during spring and summer for carpenters, painters, masons, and others in the building trades. In New South Wales the building trade is not so brisk as it was, and less wages are being accepted. The engineering trade continues good with full rates of pay. In Victoria there is no general demand for more labour, but a competent mechanic has not much difficulty in finding work. In South Australia considerable numbers of mechanics and labourers, more especially those in the engineering trades, have been out of work at Gawler, and at Port Augusta men have been thrown out of employment by the closing down of the smelters. There is practically no demand for more mechanics in other towns, but a skilled hand such as a mason, bricklayer, engine-fitter, blacksmith, joiner, or carpenter can generally find employment after looking about for a little. Reports received at the Government Labour Bureau in Western Australia at the end of last year show that there was a good demand for men at Perth, especially for those in the building trades; that there was no demand at Fremantle, Geraldton, Collie, or Busselton; that there were many unemployed at Coolgardie, Kalgoorlie, Kanowna, and neighbouring goldfields; that at Northam there was a very good demand for mechanics and unskilled labourers. In Tasmania, miners and mechanics at Zeehan, Queenstown, and Gormanston, on the west coast, and in the surrounding districts, are well employed; good fitters can generally get work without difficulty. In other parts of the State there is no general demand for more mechanics, but there is an opening for them if they have a little money. In New Zealand the building trades have been busy generally, especially at Auckland, Gisborne, Napier, New Plymouth, Westport, Christchurch and Invercargill; but at Dunedin many men are out of work. In South Africa, both in Cape Colony and Natal, there is a good demand for skilled mechanics, especially those in the building trades, if they have a little money to live on at first, but no one is now allowed to land in South Africa without a permit. This must be applied for at the Permit Office, 47, Victoria-street, S.W. The applicant must possess 100*l.*, or prove that he is in a position to maintain himself in South Africa. Applicants living within fifty miles of London must apply in person. These permits are no guarantee that the holders will be allowed to proceed inland.

RESTORATIONS AT ALNWICK CASTLE.—The south-west tower of the barbican of Alnwick Castle being considerably weathered and needing repairs, his Grace the Duke of Northumberland ordered its restoration, and the work is now going on. For some time it had been noticed that the flagging in the barbican on the north side was sinking, midway between the entrance gate and the porter's lodge, and the flags were taken up to relay them on a concrete foundation. A couple of feet or so below the surface the corbels of some building were discovered, and orders being given to continue the work of excavation, the wall to which the old drawbridge was lowered was exposed, and further excavation revealed the course of the old moat at a depth of about 10 ft., which was through a pointed chamfered arch, strongly constructed, the roof being built in the same style as the roof of the barbican beyond the portcullis. A short time since, there being traces of a portion of the wall below Hotspur's

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Chair having at one time been built up, his Grace ordered the masonry to be pulled down, with the result that two large recesses in the wall were disclosed, these having stone seats inside. The recesses were evidently the windows to some building which had been razed, but the foundations of which were traced to form large apartments. A curious feature is that the lintels of both windows outside are traceried as in chapel windows.—*Newcastle Journal.*

A SIMPLE ROOF TRUSS.—In the design of workshops, sheds, and other buildings, where fairly large areas have to be covered at a minimum cost, the adoption of the Holt roof truss may frequently be advantageous. Although no new theory is involved, the truss is an ingenious combination of cast-iron, steel, and timber, having greater strength and lightness than timber alone, while costing less than steel. Taking, as an example, a truss of 40 ft. span, there are two principal rafters, joined at the ridge by means of a cast-iron saddle and fitted at each end with a cast-iron shoe; four timber struts; four diagonal ties, each formed of steel rods, and a main tie consisting of eight steel rods. Each strut is received at its lower end by a cast-iron shoe having lugs into which the diagonal and horizontal rods are screwed. The upper ends of the struts are joined to the rafters in the ordinary manner, and the upper ends of the diagonals by means of connecting bosses, while the extreme ends of the main ties are screwed into lugs cast on the rafter shoes. The principals are usually spaced 10 ft. apart, and timber purlins can easily be fixed for carrying slate, glass, or other roof covering. One special feature of the system is that the trusses can be readily erected and fixed without the aid of skilled labour.

LEGAL.

ALLEGED INJURY TO LAND THROUGH TUNNELLING OPERATIONS.

THE cases *in re* the Great Northern and City Railway Co. and Mr. Richard Long came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Romer and Mathew, on the 25th ult., on the appeal of Mr. Long from an order of Mr. Justice Bucknill in Chambers, under Section 41 of the Regulation of Railways Act, 1868, directing that an issue should be tried in the High Court before a Judge of the King's Bench Division and a special jury. It appeared that a question arose between the Company and Mr. Long in respect of lands of Mr. Long which he alleged had been injuriously affected by some tunnelling operations carried out under the Company's statutory powers. In the ordinary course this question would be heard and determined by the Under Sheriff of Middlesex and a jury, under the Lands Clauses Consolidation Act, 1845.

On the case being called on Mr. Danckwerts, K.C. (with him Mr. Geo. Caber), took the preliminary objection that this Court had no jurisdiction to entertain the appeal, the appeal laying not to the Court of Appeal, but to the Divisional Court.

Their lordships, after hearing Mr. C. C. Scott on behalf of Mr. Long, upheld the objection and dismissed the appeal, the costs to be costs in the proceedings.

BUILDING DISPUTE TO BE TRIED AT LEEDS.

THE case of Mr. P. Hogg *v.* W. Gray, came before the Court of Appeal, composed of Lords Justices Vaughan Williams, Stirling, and Cozens-Hardy, on the 20th ult., on the appeal of the defendant from an order of Mr. Justice Kekewich in the Chancery Division, dated February 24, 1902.

The action was brought by the plaintiff to restrain an alleged infringement of the light and air coming to the plaintiff's premises, and the order appealed from was the refusal of Mr. Justice Kekewich to strike out part of the statement of claim.

Mr. Upjohn, K.C. (with him Mr. Ashton Cross) in support of the appeal, contended that the paragraph in question ought to be struck out, as it was unnecessary and tended to prejudice and embarrass the fair trial of the action. The plaintiff was asking for a mandatory injunction and the case had been remitted to Leeds for trial with a jury.

Mr. Renshaw, K.C. (for the plaintiff), was not sure that it had.

Mr. Upjohn said that, at any rate, the action was to be tried at Leeds, and the defendant was very anxious to keep off the pleadings anything that was likely to affect the minds of the jury though it would not perhaps affect the mind of a judge. The paragraph in question was to the effect that the defendant and his architect, and subsequently his solicitor, had entered into negotiations with the plaintiff's solicitors for the purpose of preventing the plaintiff from commencing proceedings, notwithstanding which the defendant had continued to build. Shortly afterwards the defendants' solicitors broke off the negotiations, and had it not been for them the plaintiff would have applied for an interlocutory injunction. It was admitted that these negotiations were without prejudice, and in order for the paragraph complained of to be of any use to the plaintiff the negotiations would have to be disclosed. They commenced on November 5, and concluded on November 28, and the defendant was willing to undertake not to plead any delay on the part of the plaintiff subsequently to November 5, 1901.

In the result their lordships without calling upon Mr. Renshaw dismissed the appeal with costs.

A CORPORATION'S BY-LAWS.

MR. JUSTICE JOYCE in the Chancery Division on the 25th ult. delivered judgment in the case of the Mayor of Devonport *v.* Tozer & Son, an action by the plaintiffs claiming:—1. An injunction to restrain the defendants from erecting or continuing the erection of any building upon, and from laying out any new street intended for use as a carriage-road upon or in connexion with the defendants' building estate known as "Great Three Corners" without having previously delivered to the plaintiffs, in accordance with the Corporation's by-laws, and obtained their approval to, proper plans and sections of such building and street, respectively, and from laying out or constructing any such street, as aforesaid, so that the width thereof shall be less than 36 ft., or being a street exceeding 200 ft. in length, and intended to form the principal approach or means of access to any domestic building, public building, or building of the warehouse class with a carriage road of less than 24 ft. in width or without a footway on each side thereof of a width not less than one-sixth of the entire width of such street, or otherwise in contravention of any of the provisions of the said by-laws; (2) an order on the defendants to remove, alter, or pull down all works begun or done by the defendants as aforesaid contrary to the said by-laws or any of them; and (3) alternatively a declaration that the plaintiffs were entitled to remove, alter, pull down, or otherwise deal with any works begun or done by the defendants as aforesaid contrary to the provisions of the by-laws or any of them. The facts sufficiently appear from the following judgment:—

His lordship, in the course of his judgment, said that the action was by the Corporation of Devonport, as the urban authority of the district of the borough, against the defendants, the owner of a piece of land described in the statement of claim as a building estate known as "Great Three Corners." This piece of land contained a little more than three acres, and was in the shape of a triangle, one side abutting upon a public highway for all kinds of traffic, known as Ham-lane, and another side upon a similar public highway, known as Tavistock-road, which road was, prior and down to November, 1900, a main road leading from Devonport to Tavistock, and, as such, vested in the County Council. The roadway of Ham-lane was within the Borough of Devonport, the fence of the defendants' land being down to November, 1900, the boundary of the borough there. But the defendants' land, together with the portion of Tavistock-road upon which the defendants' land abutted, was within the rural district of Plympton St. Mary, the land on the opposite side up to the fence of the road being in the borough of Plymouth. Within the rural district of Plympton St. Mary there were and are certain by-laws with respect to new streets framed under Section 157 of the Public Health Act, 1875. Such by-laws provide *inter alia*:—1. "Width applied to a new street, means the whole extent of space intended to be used, or laid out so as to admit of being used as a public way." "With respect to the level of new streets:—3. Every person who shall lay out a new street shall lay out such street at such level as will afford the easiest practicable gradients throughout the entire length of such street for the purpose of securing easy and convenient means of communication with any other street or intended street with which such new street may be connected or may be intended to be connected, and as will allow of compliance with the provisions of any statute or by-law in force within district for the regulation of new streets and buildings." "With respect to the width and construction of new streets:—4. Every person who shall lay out a new street which shall be intended for use as a carriage-road shall so lay out such street that the width thereof shall be 36 ft. at the least." "5. Every person who shall construct a new street which shall exceed 100 ft. in length shall construct such street for use as a carriage-road, and shall, as regards such street, comply with the requirements of every by-law relating to a new street intended for use as a carriage-road." "7. Every person who shall construct a new street for use as a carriage road shall comply with the following requirements,"—then follow specifications as to the mode of construction, levels, and so on. Then By-law 90 provides that every person who shall intend to lay out a street shall give to the Sanitary Authority certain notices and deliver plans and sections of such intended street, and By-law 97 provides that "Every person who shall offend against any of the foregoing By-laws shall be liable for every such offence to a penalty of 5*l.*, and in the case of a continuing offence to a further penalty of 40*s.* for each day after written notice of the offence from the Sanitary Authority. Provided, nevertheless, that the Justices or Court before whom any complaint may be made or any proceedings may be taken in respect of any such offence may, if they think fit, adjudge the payment as a penalty of any sum less than the full amount of the penalty imposed by this By-law." And 98: "If any work to which any of the By-laws relating to new streets and buildings may apply be begun or done in contravention of any such By-law, the person by whom such work shall be so begun or done, by a notice in writing, which shall be signed by the clerk of the sanitary authority, and shall be duly served upon or delivered to such person, shall be required on or before such day as shall be specified in such notice by a statement in writing under his hand or under the hand of an agent duly authorised in that behalf and addressed to and duly served upon the sanitary authority to show sufficient cause why such work shall not be removed, altered, or pulled down; or shall be required on such day and at such time and place as shall be specified in such notice to attend personally or by an agent duly authorised in that behalf before the sanitary authority and show sufficient cause why such work shall not be removed, altered, or pulled down. If such person shall fail to show sufficient cause why such work shall not be removed, altered, or pulled down, the sanitary authority shall be empowered, subject to any statutory provision in that behalf, to remove, alter, or pull down such work"; the statutory provision there referred to being Section 158 of the Public Health Act, 1875. By Part 5 of the Devonport Corporation Act, 1900, it was enacted that, as from November 9, 1900, the boundaries of the borough should be extended so as to comprise the defendants' land and the portion of Tavistock-road adjoining thereto, the land on the opposite side of that road remaining in the Borough of Plymouth. The defendants' land, though now within the Borough of Plymouth, was at a considerable distance from any town. The by-laws of the Borough of Devonport were for all practical purposes to the same effect as the by-laws of Plympton. It was alleged that the defendants, prior to November 9, 1900, had commenced to lay out and construct, and were then laying out and constructing, Ham-lane and Tavistock-road as "new streets" in a manner which contravened the by-laws of Plympton and also of the borough of Devonport. What the defendants had done and were doing was to erect certain houses upon their own land without removing the fence on either side, but making the necessary openings here and there so as to provide means of entrance to and exit from the houses that were being built. They had done nothing more than this. In particular, they had not attempted to alter or interfere with the roadway either of Ham-lane or Tavistock-road; and as it appeared to his lordship the defendants would have been liable to be indicted, and to an action for an injunction, if they had done so, or had in any way intermeddled with the laying out or construction of either of these highways. In reference to the erection of the defendants' houses, considered merely as houses, proper plans had been deposited with, and all necessary notices, if any, given to, the Rural Authority under the by-laws relating thereto. Such authority, in fact, did not formally either approve or disapprove of these plans, but they instituted no proceeding for penalties under the by-laws, nor did they do anything under the ninety-eighth by-law and Section 158 of the Public Health Act. Upon the transfer effected by the Act of 1900 the previous right, if any, of the Rural Authority to take proceedings for penalties under the by-laws was transferred to the Corporation of Devonport, the plaintiffs in the action. They had not taken any proceedings before the justices for penalties, but had instituted the present action. It was admitted during the course of the argument that there was no case of an injunction as to building, except if, and so far as the buildings might contravene the by-laws as to the laying out of a new street. He might, therefore, treat paragraph 1 of the claim as a claim to an injunction to restrain the defendants from laying-out Ham-lane and Tavistock-road, or either of them, as new streets in contravention of the by-laws, and the question to be determined was whether the defendants had commenced and threatened, or intended to do this. He thought it was clear that there had not been any laying out or constructing by the defendants of a new street in the ordinary, popular, and natural sense of the words, and that the defendants never intended to do anything of the kind. In fact, it was the one thing of all others which they intended not to do. They had not done and had no power to do anything outside the fence of their own land. They had simply begun to build within their own boundary. He was unable to see now what the defendants had done or were doing in laying out or constructing a new street or anything of the kind within the meaning of the by-laws unless there was some judicial decision which compelled him so to hold. His lordship did not think there was any such decision. As to paragraph 1, therefore, of the relief claimed, the case of the plaintiffs failed on the merits. With regard to the rest of the claim, his lordship said it would suffice for him to say that the defendants had not in his opinion been shown to have contravened any by-law. He was further of opinion that the action could not have been maintained by the Urban Authority even if it had been right on the merits, the action for an injunction not being the proper

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remedy. He considered that the action was misconceived, and must be dismissed with costs.

Mr. Macmorran, K.C., Mr. Hughes, K.C., and Mr. R. J. Parker appeared for the plaintiffs; and Mr. Danckwerts, K.C., and Mr. A. Glen for the defendants.

CASE UNDER THE PUBLIC HEALTH (BUILDINGS IN STREETS) ACT, 1888.

THE case of the Corporation of Blackpool *v.* Johnson came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Darling and Channell, on the 26th ult., on the appeal of the Corporation of Blackpool from the dismissal by the justices of the borough of an information preferred by the Corporation against the respondent under Section 3 of the Public Health (Building in Streets) Act, 1888, the charge being that a building in Yates-street, Blackpool, had without the consent of the Urban Authority been unlawfully erected and brought beyond the general building line, and that the respondent allowed the offence to continue after written notice on June 3, 1901. The question to be decided was raised in the form of a special case, from which it appeared that in October, November, and December, 1900, and January, 1901, plans of the premises in question consisting of a shop, house, and cellar, or workshop, were submitted to the Building Plans Committee of the borough by George Hardman, the then owner, who had built the premises. Notwithstanding that the plans were disapproved on each occasion, Hardman erected the premises. The cellar was 12 ft. beyond the building line, and 1 ft. 9 in. above the level of the street adjoining, this being the contravention complained of. It then appeared that Hardman became bankrupt, and then the premises passed to the respondent, to whom the appellants, on June 3, 1901, gave notice that he had committed an offence under Section 3 of the Act, and was liable to a penalty of 40s. for every day during which the offence was continued after the receipt of the notice. There was no evidence that the respondent was aware that Hardman had brought the building forward without the consent of the Urban Authority. On behalf of the respondent it was contended that he was not liable, as he had committed no offence. The case for the appellants was that if the successive owner were not liable the Act would become ineffective. The Justices held that the respondent had not, without the written consent of the urban authority, erected or brought forward a building in a street beyond the front main wall of the house or building on either side thereof in the same street, and was not therefore liable to the penalty, and dismissed the information. Hence the present appeal of the Corporation.

At the conclusion of the argument of Mr. Pritchard for the appellants (the respondent was not represented), the Lord Chief Justice, in giving judgment, said that what was suggested was that, inasmuch as the purchaser of a house from a builder continued to keep the house up after he had notice that the building projected too far, he was therefore liable. His lordship, however, did not think that the case of a person who had bought a house which caused an obstruction was dealt with by the section. After dealing with the cases bearing on the subject, his lordship said he thought the magistrates had taken the right view of the section. Much more stringent words would be necessary in order that a person might be convicted in circumstances such as those they had before them. He thought the appeal should be dismissed.

Mr. Justice Darling and Mr. Justice Channell concurred.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

21,465.—HOT WATER APPARATUS (DOMESTIC): *F. F. Simmance and F. Abady.*—The water is caused to flow through a cross tube from the one portion of an outer chamber into the other, and thence down and up other chambers into one above. A central flue is provided for the products of combustion. A constant head is maintained with a tank which is joined with a feed-pump to the overflow-tank, and for calorimetrical purposes the heated water is conveyed through a swinging funnel into a measure during the consumption of any ascertained amount of oil that has been measured with a balance, or whilst a gas meter records the consumption of a certain volume of gas.

21,483.—A MATERIAL FOR FIRE-BRICKS, FURNACE-LININGS, CRUCIBLES, &C.: *W. S. Rawson and R. D. Littlefield.*—A refractory and impervious material is compounded of finely-powdered magnesium oxide and a highly-basic borate, or of magnesia, dolomite, and a fusible compound of boron, the moulded articles being baked at a high temperature; they will, it is claimed, resist the chemical action of molten lead, oxide, &c. For preparing the highly-basic borate, either calcined lime at a high temperature is mixed with boron, trioxide, or boracic acid, or a mixture of borates is used.

21,506.—ROCK-DRILLS: *R. D. Harris.*—The frame carries bevel-wheels which drive another bevel-wheel that turns a tube which slides within it and on which are mounted a drill-socket and a split feed-nut, the nut, working over a feed-screw secured in the frame, is to be opened and closed with a right and left-hand screw, or by other means, racks and pinions serve for an adjustment of an extensible standard made in two parts and notched for engagement with projections from the frame.

21,515.—METALLIC FENCING: *R. R. Main.*—Notches are cut near the upper ends of the vertical bars in order that after the bars have been inserted through openings in an upper horizontal bar, and turned therein, the latter bar will sustain them, and the vertical bars can then be locked in position with a horizontal bar beneath having similar openings. For supporting and steadying the vertical bars, wedge-plates are inserted into slits in the bars, and are then fastened to the horizontal bar by screw bolts. Angle-plates secure the upper and lower horizontal bars to the standards, and recesses in the horizontal arms of the plates take rollers or balls that will allow for contraction or expansion caused by variation of temperature.

21,527.—A METHOD OF GLAZING: *F. Allen.*—Clips attach the panes to non-rebated sash-bars, and no woodwork is exposed to the action of weather. One side of the clip is secured to the sash-bar. A connecting-bar, which overlaps one pane, constitutes a stop for the intermediate pane, whilst the pane above is clipped by the overlapping rebated cornerpiece. For the ends of the roof, greenhouse, &c., simple cranked clips will serve, but the clips may be fashioned in various shapes.

21,553.—PREPARATION OF PAINTS: *F. Gerhardt.*—A coating or wash for plaster, stucco, and similar work, as well as a medium for water-paints, consists of an admixture of equal parts of casein freed from grease and Portland or other cement with water and some antiseptic from which the sediment has been separated. The liquid will form a vehicle for paints, and the sediment, having been ground and mixed with liquid, will serve either as a paint or as a coating for stucco, plaster, &c.

21,559.—BRICKS AND BLOCKS FOR BUILDERS' USE: *C. G. Picking.*—Refractory and sound-deadening bricks and blocks are made hollow and with middle interlocking ribs and recesses. They are also divided into cells, and may be either pierced or closed at the bottom.

21,574.—BLADES FOR PICKS: *H. Davies.*—A shoulder of the blade bears against the head, in the eye of which the blade is secured by the end of a spring screwed on to the head; a bolt and a nut clamp the cheeks tightly against the handle. In another form the handle is pierced for the blade, and so extends to the top of the head.

21,580.—A LIFT-VALVE: *A. Morrison.*—The spindle of the tap, which is intended for the supply to sinks, &c., has a double-threaded screw in order that the valve shall become fully opened with a half-turn of the handle. The inlet is set at a right angle to the outlet, and in order that the handle may be rendered adjustable for wear the handle end of the spindle is fashioned with a polygonal cross-section.

21,591.—A SLOW-COMBUSTION FIRE-GRATE: *F. F. Chavasse.*—Firebrick slabs, corrugated on their faces, constitute the inclined sides of the grate, and at the back are chimney-draught passages, whereof the lower ends communicate with other passages that are regulated with slides, and the upper ends with an outlet into the chimney. The bottom of the grate may be fitted with a registering air-regulator that slides upon bearers against the corrugated slabs, and with an ordinary air-regulator at its front.

21,596.—ROOFING MATERIALS AND APPLIANCES: *G. Bruck.*—The inventor fixes wire-netting over the rafters or framework of the roof, or stretches wires from the wall-plates to the ridge, or from one rafter to another, or in both those two directions, and affixes tiles, slates, or plates to the wires or battens with nibs, wires, clamps, or pins. The wires are either cemented in grooves in the tiles, or are taken by holes made in them. Horizontal rings, wires, or braced frames are employed for the building up of spires and cupolas, wires being extended from a middle pole over the frames or rings. Wires fastened to the walls and a middle ring, or diagonal cross-wires, serve to sustain a flat roof.

21,598.—MEANS OF ESCAPE FROM FIRE: *F. M. Swift.*—The inventor devises a light bridge that will afford escape from one building to another. He disposes four cables at the corners of a rectangle, and joins them to plates that are fixed in the walls, &c., with eye-bolts, to be tightened with nuts, the bridge can be gained from balconies at its ends, and wire-cloth fastened to the cables constitute its bottom and sides.

21,614.—IMPROVEMENTS IN PAINTERS' BRUSHES: *G. A. Siday.*—In order to vary the stiffness of the bristles is provided a metallic bridle, in either sheet or wire, fitted with fixed broad hooks, or eyelets, or lacing hooks and studs, which are to be pulled together with a cord that is tied around the handle and secured to a hook upon the opposite side of the bridle; when the hooks or eyelets are thus laced closely together one end of the bridle will overlap the other.

21,631.—WINDING MACHINES: *M. T. Kane and F. E. Kane.*—A ratchet wheel and two side flanges that guide two blocks fitted with pawls linked together in pairs are fitted at the end of a winding-barrel; a rack upon the upper one of the blocks engages with a pinion on the boss of a rocking lever; the two blocks will thus be moved in opposed directions around the ratchet-wheel with the rocking of the lever; at a down stroke of the lever the lower block will slip and the upper block will drive, but with its up stroke those two actions will be respectively reversed. For a positive lowering of the load there are arranged projecting pins that will work the pawls automatically and throw them into disengagement when they are moved in the direction for raising the load.

21,637. — WALL FASTENINGS FOR PIPES, &c.: *T. B. Sauer.*—The spike of a hook or staple is made detachable from its hook; in one shape of the contrivance the pointed end of the flat spike is passed through a slot cut in the hook, which is retained in its place by the head of the spike. In another shape the head of the spike is inserted through a long slot in the hook and a pin or screw holds the latter in its place.

21,667. — APPLIANCES FOR BALL-AND-FLOAT VALVES AND LIFT VALVES: *C. C. Lapsley.*—Fluid pressure maintains the lift valve (which is worked with a handle or float lever) against a seating that consists of two parts, surrounded with a coupling ring, attached between the inlet portion and the outlet portion of the casing, which has an inner flange within its lower portion; the valve stem is in engagement with a recess in a wing which lies loosely upon an eccentrical shaft mounted upon trunnions, which are passed through the casing and are slotted for the ends of the working lever.

21,692.—CONSTRUCTION OF URINALS: *J. Duckett & Son and J. W. Bullock.*—Discarding the customary copper sprinkling-pipes, the inventors fasten an earthenware scroll between the caps and the back of each stall. The joint between the caps is covered with a conduit-block which is extended downwards to meet the scroll.

21,792.—A CONTRIVANCE FOR TESTING DRAINS: *J. Macdonald and A. Macdonald.*—In place of the combustion chamber specified in Nos. 14,056 of 1884, and 7,965 of 1898, a spiral of wire is secured to the plug and the combustible material is packed into it. An apparatus for the determination of low pressures comprises a delivery pipe fitted with hand bellows in communication with a chamber, of which the outlet has a water-sealed bell for its covering, the rising whereof marks the amount of pressure which is derived from an air-pump. For high pressures a water or other gauge is provided, the cover of the casing being screwed on.

21,799.—IMPROVEMENTS IN STEPS AND RISERS: *J. B. Sangwin.*—The risers and steps are moulded in concrete, artificial stone, or other composition, with apertures or ventilation-holes for the flow of air into chambers or cellars behind them; at the back of the step are guides for a ventilator or slide-valve.

21,913.—PROCESS OF MOULDING BRICKS: *A. Clemens.*—A horizontal screw propels the common clay for the body of the brick through a chamber into the die or mouthpiece, whilst a vertical screw forces the better facing-clay downwards into the mouthpiece; between the feeding-chambers is set an adjustable dividing-plate which controls the amount of the supply of the facing-clay.

21,948.—CONCRETE-MIXING MACHINERY: *S. P. McKelvey.*—Pivoted scoops upon the drum, which is open at both its ends, force the material upwards to a certain point, as the drum turns, after which they fall over and throw the material down and across the drum. The scoops may be mounted obliquely, or the material may be worked from the feed to the point of discharge by means of inclined deflectors arranged within the drum.

21,960.—ROOFS AND ROOFING: *G. A. Nebeling.*—Cardboard, cloth, oil-paper, or similar sheets, are used for caulking tiled roofs; to one edge of each sheet is affixed a channel strip or clip of metal, which will fasten the edge of the next sheet over the rib of the next tile. Metallic clips fasten the tiles on to the battens.

21,967.—A PANTOGRAPH OR COPYING INSTRUMENT: *N. Kotko.*—The instrument is devised for making many copies at once, and, it may be, to different scales. Two sets of links connect two parallelograms together; a bar, which is pivoted at its middle point to a fixed bar, is linked adjustably to the outer sides of the parallelograms, the links being rendered adjustable with screws and sleeves. At various points along the sides of the links and parallelograms are disposed the holders for the copying-pencils.

22,007.—MECHANISM FOR CRANES: *R. A. Needham and R. L. Kemp.*—The inventors contrive that the travelling crane shall, as it reaches a certain point on the rails, receive a trolley from a side-rail mounted in a frame, and shall transfer the trolley at another point of its course on to an opposite side-rail; provision is made for preventing the trolley from running over the ends of the crane gantry when it is not opposite to either transfer-point; at those two points are notched plates which engage with the hooked end of a rod, whilst at intervening points a plate will keep the rod down and so stop the trolley, the rods are carried by pivoted levers at the inner ends of which are friction-wheels for engagement with the top of the trolley; on the descent of those ends—as the trolley passes on to a side-rail—the gantry will remain locked by the lever until the trolley has been returned.

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22,014.—WATER SUPPLY FOR BATHS: *H. L. Doulton.*—Two disc-valves, carried by spindles which, under normal conditions, are supported by springs in cylinders, control the supply of hot and cold water, respectively. Two plugs upon a cross-bar engage with the cylinders, and are to be lifted and lowered with a key that acts through a nut upon the stem of the handle. For cutting off either one or the other supply a disc is fitted upon the spindle, and for the opening of one valve before the other its spindle is made longer.

22,041.—A METHOD OF CASTING PIPE-BENDS: *F. P. Fullerton.*—The invention relates to the casting of pipe-bends for closets, sinks, &c., with a metal core, which shall insure a smooth inner surface; the screwed ends of the core, which is bent to the arc of a circle, are fixed with collars which, after the bend has been cast, are firstly unscrewed and next screwed on again over the bend for keeping the two halves of the mould in position, then a collar is screwed on the top of the bend, and a screw-plug is inserted and screwed in, whereupon the core will be expelled. A mould serves to form the flange on the bend.

MEETINGS.

FRIDAY, APRIL 4.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. E. Worth on "Sewerage." 7 p.m.

Institution of Mechanical Engineers. — The four papers on "The Fencing of Machinery" will be further discussed. 8 p.m.

Institution of Civil Engineers.—(Students' Meeting). Mr. L. G. Crawford on "Compressed Air, and its Applications." 8 p.m.

Institute of Sanitary Engineers, Ltd.—Examination for admission.

SATURDAY, APRIL 5.

Sanitary Institute (Demonstrations for Sanitary Officers). — Inspection at the Sewage Outfall Works, Barking. 3 p.m.

Edinburgh Architectural Association.—Visit to the Lauder Technical School, Dunfermline.

Incorporated Association of Municipal and County Engineers.—Midland district meeting, to be held at Birmingham.

British Institute of Certified Carpenters.—6 p.m.

Institute of Sanitary Engineers, Ltd.—Examination for admission to the Institute.

MONDAY, APRIL 7.

Royal Institute of British Architects.—(1) Election of candidates for membership. (2) To read papers on "Inlay and Marquetry," by Messrs. Heywood Sumner and W. Aumonier, with practical demonstrations. (It is hoped that a loan of a number of specimens of inlay and marquetry will be granted for the occasion by the South Kensington Museum authorities.) 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. E. Worth on "Sewage Disposal." 7 p.m.

Society of Engineers. — Mr. H. E. Bellamy on "Australian Timber Bridges and the Woods used in their Construction." 7.30 p.m.

Dundee Institute of Architecture.—Visit to Aberdeen.

TUESDAY, APRIL 8.

Society of Arts (Applied Art Section).— Professor Beresford Pite on "Street Architecture." Mr. T. G. Jackson, R.A., will preside. 8 p.m.

Institution of Civil Engineers.—Papers to be further discussed—(1) "The Greenwich Footway-Tunnel," by Mr. W. C. Copperthwaite; (2) "Subaqueous Tunnelling through the Thames Gravel: Baker-street and Waterloo Railway," by Mr. Arthur H. Haigh, B.Sc. 8 p.m.

WEDNESDAY, APRIL 9.

Society of Arts.—Major-Gen. John F. Crease, C.B., on "Ceuta and Gibraltar." 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—(1) Inspection in the District of Islington and at the Borough Disinfecting Station, 2 p.m. (2) Mr. J. E. Worth on "Scavenging, Disposal of House Refuse." 7 p.m.

Institute of Sanitary Engineers, Ltd.—Examination and Literary Committee at 3.30 p.m. General Purposes and Finance Committee at 4 p.m. Election Committee at 5.15 p.m. Sessional meeting at 7 p.m.

Institution of Civil Engineers.—Students' visit to the works of Messrs. Doulton & Co., Ltd., High-street, Lambeth, S.E. Assemble at the Works at 2.30 p.m.

THURSDAY, APRIL 10.

Institution of Electrical Engineers.—Discussion on the paper by Messrs. J. Swinburne and W. R. Cooper, entitled "Problems of Electric Railways." 8 p.m.

Society for the Encouragement of the Fine Arts.—Lecture by Mr. E. Doran Webb, F.S.A.

FRIDAY, APRIL 11.

Architectural Association.—1. Special meeting to consider some alterations and additions to the by-laws. 2. Mr. W. D. Caröe on "The Preservation of Ancient Buildings." 7.30 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. J. I. Little on "The Sewage Disposal of a Country House." 8 p.m.

Royal Institution.—Professor Dewar, M.A., on "Problems of the Atmosphere." 9 p.m.

Sheffield Society of Architects and Surveyors.—Annual meeting.

SATURDAY, APRIL 12.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage and Destructor Works, Ealing. 2.15 p.m.

WEDNESDAY, APRIL 16.

Society of Arts.—Ordinary meeting. Mr. J. Bridges Lee, M.A., on "Photographic Surveying." 8 p.m.

THURSDAY, APRIL 17.

Society of Arts (Indian Section).—Mr. Sidney Preston, A.M.Inst.C.E., on "Recent Developments in Punjab Irrigation." 4.30 p.m.

WEDNESDAY, APRIL 30.

Society of Arts.—Ordinary meeting. Mr. Edward T. Scammell on "The Timber Resources of the Australian Commonwealth." 8 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

March 24.—By BARKER & NEALE.

Hampstead.—23, Belsize-pk-gdns, u.t. 50 yrs., g.r. 30*l.*, e.r. 120*l.* £525

Belgravia.—Wilton-cres., i.g.r. 65*l.*, u.t. 22 yrs., g.r. 15*l.*, with reversion 2,100

March 24.—By BEALE & CAPPS.

Notting Hill.—216 and 218, Lancaster-rd., u.t. 62 yrs., g.r. 16*l.*, e.r. 100*l.* 875

142 Walmer-rd. (S), u.t. 49½ yrs., g.r. 6*l.* y.r. 45*l.* 540

By J. H. BETHELL.

East Ham.—170, Browning-rd., f., e.r. 35*l.* 480

By BROWETT & TAYLOR.

Lee.—277, High-rd., u.t. 55¾ yrs., g.r. 14*l.* e.r. 65*l.* 480

Beckenham.—39, Kent House-rd., u.t. 81½ yrs., g.r. 5*l.*, e.r. 32*l.* 320

By FISHER, STANHOPE & DRAKE.

Stamford Hill.—No. 101, u.t. 81 yrs., g.r. 15*l.* y.r. 90*l.* 950

By MESSRS. KEMSLEY.

Chigwell.—High-rd., Oak Farm House, and 1 a. 3 r. 25 p., c., p. 920

Navestock Common, Essex.—Sheep House and 2 a. 3 r. 20 p., f., y.r., 13*l.* 10s. 315

By G. A. MCDOWELL (at Stratford).

Plaistow.—20, 22, and 24, Adine-rd., u.t. 75½ yrs., g.r. 9*l.*, w.r. 58*l.* 10s. 425

March 25.—By BRADSHAW BROWN & CO.

Poplar.—32 to 40, Well-st., u.t. 61¾ yrs., g.r. 35*l.*, w.r. 213*l.* 4s. 1,400

By MOSS & JAMESON.

Wandsworth.—42, Devereux-rd., u.t. 88½ yrs., g.r. 7*l.*, e.r. 35*l.* 325

By NOTT, CARTWRIGHT, & ETCHES.

Pimlico.—66 and 68, Hanover-st., u.t. 23 yrs., g.r. 16*l.*, y.r. 90*l.* 630

35, Hanover-st., u.t. 22¾ yrs., g.r. 7*l.* 7s., y.r. 50*l.* 385

104, Alderney-st., u.t. 26 yrs., g.r. 8*l.* 10s., y.r. 55*l.* 475

21, Moreton-ter., u.t. 28½ yrs., g.r. 8*l.*, w.r. 83*l.* 4s. 430

1A, Ranelagh-cottages, u.t. 10¾ yrs., g.r. 5*l.* y.r. 35*l.* 120

Fulham.—435, North End-rd. (S.), u.t. 55 yrs., g.r. 9*l.*, y.r. 100*l.* 420

Norwood.—79, Harrington-rd., u.t. 49 yrs., g.r. 8*l.* 2s. 6d., y.r. 26*l.* 205

By RUTLEY, SON, & VINE.

Kentish Town —2, Rhyl-st., f., e.r. 42*l.* 600

Kilburn.—196, Carlton Vale, u.t. 64½ yrs., g.r. 9*l.* 9s., e.r. 50*l.* 420

Hampstead-rd., 44, Mornington-cres., f., y.r. 55*l.* 700

Marylebone —42, Langham-st., u.t. 37 yrs., g.r. 48*l.*, y.r. 130*l.* 925

Caledonian-rd.—No. 80, u.t. 32 yrs. g.r. 8*l.*, y.r. 40*l.* 400

By A. W. TAYLOR & CO.

Old Kent-rd.—Rotherhithe New-rd., The Royal George p.-h., u.t. 49½ yrs., g.r. 6*l.*, y.r. 100*l.* .. 1,570

By FREDK. WARMAN.

Holloway.—€2, Holloway-rd., with land adjoining, f., p. 1,000

Highbury.—67, Highbury Hill, u.t. 60 yrs., g.r. 12*l.* 10s., e.r. 70*l.* 565

Canonbury.—32, Canonbury Pk. South, u.t. 35 yrs., g.r. 9*l.*, e.r. 65*l.* 600

38, 40, and 42, Canonbury Pk. South, u.t. 34 yrs., g.r. 21*l.* 15s., y.r. 190*l.* 1,595

83, Marquess-rd., u.t. 44 yrs., g.r. 10*l.*, e.r. 70*l.* 540

March 26.—By DYER, SON, & HILTON.

Poplar.—50 and 51, Wells-st., f., w.r. 37*l.* 14s. .. 330

By MARK LIELL & SON.

Stratford.—87 to 111 (odd), Livingstone-rd., u.t. 65 yrs., g.r. 40*l.* 19s., w.r. 243*l.* 2s. 1,175

By ROBINS, GORE, & MERCER.

Marylebone —66, Bolsover-st.; and 216 and 216a, Great Portland-st., u.t. 7¾ yrs., g.r. 40*l.*, w.r. 306*l.* 16s. 420

South Kensington.—6, Prince Teck-bldgs. (S), f. y.r. 112*l.* 16s. 1,530

By WRIFORD & DIXONS.

Vauxhall.—1, Auckland-st., f., y.r. 70*l.* 1,040

By BELCHER, ADKIN, & BELCHER (at Wantage).

Challow Hill, Berks.—Hill House Estate, 60 a. 2 r. 13 p., f., p. 4,350

By T. LAVINGTON (at Pewsey).

Pewsey, Wilts.—High-st., freehold business premises, y.r. 40*l.* 610

North Newnton, Wilts.—Enclosure of meadow, 3 a. 2 r. 10 p., f., y.r. 7*l.* 250

By T. WOODS (at Hanworth).

Hanworth, Middx.—1 to 6, Portland Cottages, f., w.r. 57*l.* 4s. 795

1 to 5, Elder Cottages, f., w.r. 26*l.* 270

1, 2, and 3, Mary's Cottages, f., w.r. 32*l.* 10s. .. 340

By T. WOODS (at Hounslow).

Hounslow, Middx.—99 and 101, High-st., c., p... 400

Hanworth-rd., a building site, c., y.r. 4*l.* 205

1 and 2, Rose Villas, f., w.r. 33*l.* 16s. 500

March 27.—By A. H. TURNER & CO.

Twickenham, Middx.—Cambridge-pk. - gdns., Burley, f., y.r. 150*l.* 2,025

Contractions used in these lists.—F.g.r. for freehold ground-rent; gdns. for gardens; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; yd. or yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 11 6	per 1,000 alongside, in river.
Rough Stocks and Grizzles	1 9 6	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 5 0	,, ,, ,,
Flettons	1 8 0	,, at railway depôt.
Red Wire Cuts ..	1 12 0	,, ,, ,,
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,, ,, ,,
Best Blue Pressed Staffordshire ..	4 6 6*	,, ,,
Do., Bullnose	4 10 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 5 6	,, ,, ,,
GLAZED BRICKS		
Best White and Ivory Glazed Stretchers.....	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers..	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers..	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	14 0 0	,, ,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,, less than best.
Thames and Pit Sand	7	3 per yard, delivered.
Thames Ballast	6	0 ,, ,,
Best Portland Cement	32	0 per ton, delivered.
Best Ground Blue Lias Lime..	25	0 ,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. od. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depot
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 3	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks ..	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2	7 per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1	2½ ,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	12 0 0	per 1000 of 1200 at ry. dep.
,, best seconds ,,	11 10 0	,, ,,
16×8 best ,,	6 15 0	,, ,,
20×10 best blue Portmadoc	11 5 0	,, ,,
16×8 best blue Portmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green....	12 2 6	,, ,,
16×8 ,, ,,	7 5 0	,, ,,
20×10 permanent green	10 5 0	,, ,,
16×8 ,, ,,	5 17 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles..	41 6	per 1,000, at rly. depôt.
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,

[*See also p. 355.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Memorial to Queen Victoria, Guildhall, York	The Committee	50*l.*	May 1
*Infectious Disease Hospital	Harrogate, &c., Jt. Isol. Hosp. Com	100*l.* and 50*l.*	June 1
*Police and Fire Brigade Buildings	County Borough of Sunderland	100*l.*, 50*l.*, and 25*l.*	Aug. 30

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*New Roads, Muswell Hill	The Company	Vigers & Co., 4, Frederick's-place, Old Jewry, E.C.	April 7
Institute and Public Hall, Beaminster, Dorset	.....	Kitson & Trotman, Fleet-street, Beaminster	April 8
Four Villas, Whiteabbey, Belfast	.....	J. G. Lindsay, Architect, 1, Glengall-place, Belfast	do.
Reservoir, Cononley, near Keighley	.....	J. W. Broughton, Surveyor, High-street, Skipton	do.
*Granite Kerb and Setts	Edmonton U.D.C.	Council's Engineer, Town Hall, Edmonton	do.
Laying Water Main, &c., Conway-road to Rhos	Colwyn Bay U.D.C.	W. Jones, Civil Engineer, Council Offices, Colwyn Bay	do.
Additions to Schools, Lagland-street, Poole	Trustees of the British Schools	H. F. J. Barnes, Architect, Towngate-street, Poole	do.
Bridge Works, Skewen	Glamorgan County Council	T. Mansel Franklen, Westgate-street, Cardiff	do.
Portland Cement, &c. (18,000 tons)	Swansea Town Council	J. Thomas, Guildhall, Swansea	do.
Road Metal, &c.	St. Mellons R.D.C.	I. Thomas, Union Offices, Queen's Hill, Newport, Mon.	do.
Villa, Resolven, Wales	Mr. John Owen	Smith & Davies, Architects, Aberdare	do.
Paving Works, &c., Union-road	Dover Town Council	H. E. Stilgoe, Civil Engineer, Town Hall, Dover	do.
Granite Road Metal	Shoreham R.D.C.	E. Cripps, Council Offices, Ham-road, Shoreham	do.
Road Materials	St. Mellons (Cardiff) R.D.C.	I. Thomas, Union Offices, Newport, Mon	do.
Paving, &c., Marlborough-lane	Cardiff Corporation	W. Harpur, Civil Engineer, Town Hall, Cardiff	do.
Church, Lismullen, Ireland	.....	Fred Shaw, Architect, Drogheda	April 9
House, Carlton, Lowestoft	.....	R. S. Cockrill, Architect, Lowestoft	do.
Paving, &c., Hunslet Goods Yard, Leeds	North Eastern Railway Company	W. J. Cudworth, Engineer, York	do.
Additions to Schools	Griffithstown School Board	Lansdowne & Griggs, Architects, Newport, Mon.	do.
Granite Road Metal (2,000 tons)	Worksop U.D.C.	G. H. Featherston, Town Hall, Worksop	do.
Granite Road Metal	Mutford R.D.C.	F. G. Marsh, Surveyor, Victoria-road, Lowestoft	do.
Post Office, Omagh, Ireland	Office of Public Works, Dublin	J. L. Donnelly, Architect, Town Surveyor, Omagh	do.
Wall, &c.	Derby Corporation	J. Ward, Civil Engineer, Babington-lane, Derby	do.
Villa, Wood Top, Slaithwaite, Yorks	.....	J. Berry, Architect, Market Place, Huddersfield	April 10
Organ Chamber, St. Peter's Church, Mansfield	.....	C. Hodgson Fowler, Architect, Durham	do.
Chapel, Hawksworth, Yorks	.....	Walker & Collinson, Architects, Swan Arcade, Bradford	do.
Sewerage Works	Wilmslow U.D.C.	A. S. Cartwright, Surveyor, Council Offices, Wilmslow	do.
Cast Iron Pipes, &c.	Bingley (Yorks) U.D.C.	H. Bottomley, Surveyor, Town Hall, Bingley	do.
House, Burnopfield, Durham	Mr. J. Watson	G. T. Wilson, Architect, 21, Durham-road, Blackhill	do.
Road Materials, &c., Oakham	Rutland County Council	B. A. Adams, Council Offices, Oakham	do.
Laying Water-Main, Harehills	Leeds Corporation	City Engineer, Town Hall, Leeds	do.
Paving King's Quay-street	Harwich Town Council	H. Ditcham, Borough Surveyor, Harwich	do.
Cast-Iron Pipes (400 tons)	Chester Gas Co.	J. C. Belton, Engineer, Roodee, Chester	do.
Two Villas, Malone-road, Belfast	.....	Blackwood & Jury, Architects, 41, Donegall-place, Belfast	April 11
Road Works, Garstang-road, and Others	Preston Corporation	Borough Surveyor, Town Hall, Preston	do.
Paving Ruskin and Trower-streets	do.	do.	do.
Road Metal, &c. (1,700 tons), near Barnsley	Hoyland Nether U.D.C.	W. P. Young, Surveyor, Town Hall, Hoyland	do.
House and Cottage, Parkgate, Rotherham	Trustees	J. Platts, Architect, High-street, Rotherham	do.
Nurses' Home, Eccles Old-road, Pendleton	Salford Guardians	H. Lord, Architect, 42, Deansgate, Manchester	do.
Road Works, Sydney-road, Cradley Heath	Rowley Regis U.D.C.	D. Wright, Council Offices, Lawrence-lane, Old Hill	do.
School, Manchester-road, Swindon	.....	R. J. Beswick, Architect, 35, Regent-street, Swindon	April 12
Road Metal (3,500 tons), Sheffield	Kiveton Park R.D.C.	J. P. Evans, Surveyor, Council Offices, Kiveton Park, Sheffield	do.
Additions to Business Premises	Treorky Industrial Co-op. Society	J. Rees, Architect, Pentre	do.
Sewerage Works	Bathgate (N.B.) Town Council	P. C. Hart, Civil Engineer, 134, St. Vincent-street, Glasgow	do.
Refuse Destructor	Loughborough Town Council	A. H. Walker, Civil Engineer, Town Hall, Loughborough	do.
Works at Hospital, Claverton Down, Bath	.....	F. W. Gardiner, Architect, Barton-street, Bath	April 14
*Erection of Schools	Old Brentford School Board	Nowell, Parr & A. E. Kates, Archts., 5, Brent-rd., Brentford, W.	do.
Schools &c., Rhosllanerchrugog, Wales	.....	Rev. R. Roberts, Laurel House, Rhosllanerchrugog	do.
Granite Setts (2,700 tons)	Coventry Corporation	J. E. Swindlehurst, Civil Engineer, St. Mary's Hall, Coventry	do.
Granite Road Metal, Sudbury	West Suffolk County Council	A. A. Hunt, County Surveyor, Sudbury, Suffolk	do.
*Additions, Leavesden Asylum, near Watford	Metropolitan Asylums Board	Office of Board, Embankment, E.C.	do.
*Heating, &c., Works, Leavesden Asylum, nr. Watford	do.	do.	do.
Road Metal, &c.	Midsomer Norton U.D.C.	Surveyor, Market Hall, Midsomer Norton	do.
Steel Girders, &c.	Coventry Corporation	J. E. Swindlehurst, Civil Engineer, Town Hall, Coventry	do.
Road Stone, &c., West Parade	Bexhill U.D.C.	G. Ball, Civil Engineer, Town Hall, Bexhill	do.
Promenade Works	do.	do.	do.
Laying Mains	Stamford Waterworks Co.	J. Eunson, Civil Engineer, Northampton	do.
Reservoir, &c.	do.	do.	do.
Schools, Lexford Hall Estate	Ilford School Board	C. J. Dawson, Architect, 7, Bank-buildings, Ilford	do.
Road Metal, &c.	Bexhill U.D.C.	G. Ball, Civil Engineer, Town Hall, Bexhill	do.
Engineering Work, &c., at Pumping Station, Milford	Stafford Waterworks Co.	W. Blackshaw, Borough Engineer, Borough Hall, Stafford	do.
*Making New Roads at Clapham Common	.....	W. G. Ingram, 44, Theobald's-road, Bedford-row, W.C.	April 15
Church, Barton-on-Humber	.....	C. Hodgson Fowler, Architect, Durham	do.
Slaughter House, West Kilbride, N.B.	Ayrshire County Council	A. M. Quaker, Architect, Glenbank, Dalry	do.
*Additions, &c., Aldershot Police Station	Southampton County Council	County Surveyor, The Castle, Winchester	do.
*Supply and Fixing of the Firemains Hydrants	West Ham Union	F. J. Sturdy, 45, Finsbury-pavement, E.C.	April 16
Sewerage Works, &c.	Tarporley (Cheshire) U.D.C.	C. E. Bruges, Engineer, 1, Victoria-street, S.W.	do.
*New Coastguard Buildings, near Falmouth	Admiralty	Director of Works Dept., Admiralty, 21, Northumberland-avenue	April 18
Alterations to Schools, Fochriw, Wales	Gelligaer School Board	James & Morgan, Architects, Charles-street Chambers, Cardiff	April 19
Restoration, Holy Trinity Church, Micklegate, York	.....	C. Hodgson Fowler, Architect, Durham	do.
*Terra-Cotta Public Baths, Old Trafford, Manchester	Stretford U.D.C.	E. Woodhouse, Architect, 88, Mosley-street, Manchester	do.
*Maintenance and Repair of Main Roads	Kent County Council	County Surveyor, Maidstone	April 21
*Boundary Walls, Shepherd's Bush	Hammersmith Guardians	J. H. Richardson, Architect, 87, Finsbury-pavement	do.
*Boundary Walls and Railing, Wormwood Scrubs	do.	Giles, Gough, & Trollope, Architects, 28, Craven-street, Strand	do.
*Firemen's Dwellings, &c.	Hornsey U.D.C.	Council's Engineer, Southwood-lane, Highgate, N.	do.
*Public Street Lighting	do	do.	do.
Additions to Workhouse, near Colchester	Tendring (Essex) Guardians	F. Whitmore, Architect, 17, Duke-street, Chelmsford	April 22
*Free Library Extensions	Wimbledon U.D.C.	R. J. Thomson, Architect, 47, Hill-road, Wimbledon	do.
*Wrought Iron Railings and Gates	West Ham Council	Borough Engineer, Town Hall, West Ham, E.	do.
*Steam Road Roller Shed and Offices	do.	do.	do.
*Main Sewerage Works	Kingsbury U.D.C.	Council's Offices, Kingsbury-road, N.W.	April 23
*Erection of Police Buildings	East Sussex County Council	County Surveyor, County Hall, Lewes	April 25
Sewerage Works, Bridge-street	West Hartlepool Corporation	J. W. Brown, Borough Engineer, Town Hall, West Hartlepool	do.
Rebuilding the Shades Inn, Wakefield	.....	Watson, Son, & Ellison, Architects, Wakefield	No date
House, Uppleby, Easingwold, Yorks	.....	J. F. Todd, Architect, Uppleby, Easingwold	do.
Two Villas, Cwmbach, Aberdare	.....	S. J. Williams, Architect, 23, Montague-terrace, Aberdare	do.
Laying Water Pipes, Wellington, Salop	.....	G. Thorneycroft, Dunston, Stafford	do.
Additions to the Lamb Inn, Blaina	Messrs. Griffiths Bros., Limited	Lansdowne & Griggs, Architects, Newport, Mon.	do.
Additions to the Buller's Arms Inn, Blaina	do.	do.	do.
Shed, Eastwood Mills, Bradford	.....	Empsall & Clarkson, Architects, 7, Exchange, Bradford	do.
Additions to Schools	Burnham-on-Crouch (Essex) S.B.	Chancellor & Son, Architects, Chelmsford	do.
Bridge Works, Commercial-road	Bedford Corporation	J. Lund, Borough Engineer, Town Hall, Bedford	do.
Five Houses, Normacot, Stafford	Mr. H. Hines	W. Wood, Architect, Stafford-street, Longton	do.
Boundary Walls, &c.	Barnard Castle Gas Co.	Pegg & Co., Architects, 7, Market-place, Barnard Castle	do.
*Three Houses with Shops, West Norwood	.....	—. Blackburn, 6, Queen Anne's Gate, S.W.	do.
Extension of School, Fanny-road, Barnes	Barnes School Board	C. Innes, Architect, 50, Cannon-street, E.C.	do.

[See also next page.

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PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*District Superintendent	Camberwell Borough Council	150*l.*	April 14
*Surveyor	Rawmarsh U.D.C.	2*l.* 2*s.* per week	do.
*Depot Manager	Metro. Boro' of St. Marylebone	2*l.* 5*s.* per week	do.
*Surveyor's Assistant	Beckenham U.D.C.	100*l.*	do.
*Chief Engineer and Surveyor	County Borough of Northampton.	600*l.* per annum	April 16
*Clerk of Works	Stepney Union	3*l.* 3*s.* per week	April 21
*District Surveyors (3)	London County Council	900*l.*, 800*l.*, and 600*l.*	April 30

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, p. iv. *Contracts*, pp. iv. vi. viii. & x.. *Public Appointments*, xviii. & xix.

PRICES CURRENT (*Continued*).

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	14 10 0	16 0 0
Deals: best 3 by 9	13 10 0	15 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in	10 10	11 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	" " "
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
" by 4½ in. and 2 in by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards—		
1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	"
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft.)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
" " 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 0 0	15 0 0
" " " 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
" " " 3 in. by 9 in.	12 0 0	13 0 0
" " " battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 0
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
¾ in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders " "	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars	7 15 0	8 5 0
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 10 0
" galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
" " to 24 g.	11 0 0	- - -
" " to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	- - -
" " 22 g. and 24 g.	13 5 0	- - -
" " 26 g.	14 5 0	- - -
Sheet Iron, Galvanised, flat, best quality:—		
Ordinary sizes to 20 g.	16 0 0	- - -
" " 22 g. and 24 g.	16 10 0	- - -
" " 26 g.	18 0 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
" " 22 g. and 24 g.	13 5 0	- - -
" " 26 g.	14 5 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 0 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 5 0	9 15 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 0 0	- - -
Pipe in coils	14 10 0	- - -
Soil Pipe	17 0 0	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 0	- - -
Thin "	0 1 1½	- - -
Copper nails "	0 1 1½	- - -
BRASS—		
Strong Sheet "	0 0 11	- - -
Thin "	0 1 1	- - -
TIN—English Ingots "	0 1 3	- - -
SOLDER—Plumbers' "	0 0 6½	- - -
Tinmen's "	0 0 8	- - -
Blowpipe "	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
" fourths	2¾d. " "
21 oz. thirds	3½d. " "
" fourths	3d. " "
26 oz. thirds	4½d. " "
" fourths	4d. " "
32 oz. thirds	5½d. " "
" fourths	5d. " "
Fluted sheet, 15 oz.	3d. " "
" 21 "	4d. " "
⅛ Hartley's Rolled Plate	2d. " "
⅜ " " "	2½d. " "
½ " " "	2½d. " "

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" " " in barrels	"	0 2 10
" " " in drums	"	0 3 0
Boiled " " in pipes	"	0 2 11
" " " in barrels	"	0 3 0
" " " in drums	"	0 3 2
Turpentine, in barrels	"	0 2 6
" in drums	"	0 2 8
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	"	20 10 0
Best Linseed Oil Putty	per cwt.	0 8 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
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Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
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Berlin Black	0 16 0
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J. B.—W. & N. (Amounts should have been stated.)

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Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BIRMINGHAM.—For the erection of premises, Montgomery-street, Birmingham, for Fairbanks, Limited. Mr. Chas. Hook Collett, architect. Quantities by Mr. Hy. Glover:—

With Asphalted Roof.

Gill	£3,760	Crowder	£2,870
Rowbotham	3,535	Elvin	2,826
Briley	3,320	Harley	2,820
Davis	3,008	Webb	2,791
Whittall	2,916	Bishop	2,787
Lee	2,913	Smith & Pitts	2,710
Baker & Warr	2,876	Morris*	2,640

CHELMSFORD.—For the extension of building for the Star Co-operative Society, Chelmsford. Messrs. Chas. and W. H. Pertwee, architects, Chelmsford:—

		With Fireproof Floor.
Frank Johnson	£1,575	£1,650
Ernest West	1,570	1,620
Smith & Son	1,495	1,550
Wm. Fincham	1,425	—
Jesse Gowers	1,405	1,435
Lummis & Son	1,350	1,385
Henry Potter	1,300	1,375

HARPENDEN.—For the erection of a house at Harpenden, Herts, for Mr. Francis Hollingworth. Mr. Lewis E. G. Collins, architect. Quantities supplied:—

G. & J. Waterman	£2,090	Miskin & Sons	£1,980
Jarvis & Sons	2,044	Phillips & Blake*	1,745

HARROW.—For alterations to Ida Cottage, for the Urban District Council. Mr. J. P. Bennetts, Engineer, Council Offices, Harrow-on-the-Hill:—

Bracey & Clarke, Watford* £110

LOUGHBOROUGH (Leics.).—For taking down and rebuilding business premises, High-street and Market-place, for Mr. H. F. Young, part being occupied by Lloyds Bank, Ltd. Mr. A. E. King, architect, Baxtergate, Loughborough. Quantities by architect:—

Brown & Son	£3,286	Barker & Son	£3,070
A. B. Clarke‡	3,248	A. Faulks, Loughborough*	2,950
Ford & Co.	3,119	Hutchinson & Son‡	2,890
E. Orton‡	3,095		
W. F. Harding	3,070		

‡ Received too late.

MERTHYR CYNOG.—For erection of vicarage. Mr. Glendinning Moxham, architect, Swansea:—

R. L. Williams* £589

NEWBOROUGH (Anglesey).—For the erection of public hall, library, &c., for Mr. J. Prichard-Jones, London. Mr. R. L. Jones, architect, 14, Market-street, Carnarvon:—

W. Parry	£6,350
Without fireproof flooring	6,200
Roberts & Williams	5,719
Without fireproof flooring	5,519
Roberts Bros.	5,600
If Cefn stone is used instead of Yorkshire	5,450
D. Owen	5,202
W. & O. Pritchard	5,187
W. Pritchard	5,000
Without fireproof flooring	4,800
R. & J. Williams	4,863
T. P. Thomas	4,860
Cefn stone to be used instead of Yorkshire.	
H. Hughes, Newborough, Anglesey*	4,550
Without fireproof flooring	4,320

[*See also next page.*

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PAIGNTON.—For the erection of five dwelling-houses and shops, for Mr. W. Lambshead. Mr. W. G. Couldrey, architect, Paignton. Quantities by Mr. Vincent Cattermole Brown, Paignton :—

Lethbridge	£13,300 0	F. Westlake	£11 865 16
Parker Bros.	12,559 0	E. P. Bovey	11,835 0
C. & R. E. Drew	12,167 0	Yeo & Sons, Torquay*	11,250 0
Webber & Sons	12,085 0		

PAIGNTON.—For erection of cottage flats for Mr. W. M. G. Singer. Mr. W. G. Couldrey, architect, Paignton. Quantities by Mr. Vincent Cattermole Brown, Paignton :—

E. Westlake	£3,120	C. & R. E. Drew	£3,070
R. Harris	3,106	Webber & Sons*	2,970
G. Webber	3,090		

PURLEY.—For erection of a pair of semi-detached houses in Brighton-road, Purley (first pair). Mr. Frank Windsor, architect, 9 and 10, Bank Buildings, George-street, Croydon :—

J. Horrocks†	£1,890	F. Clarke	£1,586
Ludlow & Martin	£1,525		

SWANSEA.—For alterations, &c., to 2, Glanmor-crescent, Swansea. Mr. Glendinning Moxham, architect :—

J. & F. Weaver	£315 0	Henry Billings	£308 15
Bennett Bros.	315 0	John Davies*	308 15

SWANSEA.—For alterations to the Bungalow, Sketty. Mr. Glendinning Moxham, architect :—
Walters & John*..... £564

SWANSEA.—For completion of shops and premises, High-street. Mr. Glendinning Moxham, architect :—
Benjamin Lewis*..... £1,928

SWANSEA.—For a pair of cottages, Skewen, near Swansea. Mr. Glendinning Moxham, architect :—

Goodridge & Son	£560	Walters & John*	£536

SWANSEA.—For a pair of villas, Sketty, near Swansea. Mr. Glendinning Moxham, architect :—
J. & F. Weaver*..... £1,290

SWANSEA.—For alterations and additions to Swansea Hospital. Mr. Glendinning Moxham, architect :—

Walters & John	£2,903 0 0	Lloyd Bros.	£2,790 0 0
J. and F. Weaver	2,891 0 0	Griff Davies	2,740 0 0
T. Richards	2,850 0 0	Thomas, Watkins & Co.	2,669 3 4
Marles & Son	2,850 0 0	J. Davies	2,655 0 0
Bennett Bros.	2,835 0 0	Davies & Co.	2,486 4 0
Goodridge & Son	2,830 0 0	H. Billings*	2,420 0 0

ST. MARK'S WYKE (Surrey).—For erection of vicarage at St. Mark's Wyke, Surrey. Mr. Glendinning Moxham, architect, Swansea :—
Henry Billings*..... £1,842

TAUNTON.—For the erection of refuse-destructor buildings, Target Field, for the Town Council. Mr. T. H. Smith, Borough Surveyor, Corporation-street, Taunton :—
Moggridge .. £1,146 5 11 | Page, Cardiff * £1,071 16 4
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	Alterations, &c.	Shop Fittings.	Total.
	£	£	£
Castle & Co.	—	—	900
Ridgway & Son	695	368	1,063
J. Reed	857	—	—
White, Manor Park*	—	—	890
Baughan & Co.	—	264	—
Jones & Co.	—	305	—

WEYBRIDGE.—For National Schools. Mr. A. H. Ryan-Tenison, architect, 12, Little College-street, Westminster, S.W. Quantities supplied :—

	Schools and Playground.	Master's House.	Total.
Palmer	£4,722 5 0	£1,226 0 0	£5,948 5 0
Barker & Co.	4,523 0 0	983 0 0	5,506 0 0
A. & H. Quibell	4,334 0 0	1,047 0 0	5,381 0 0
H. P. Hill	4,092 16 0	959 17 0	5,052 13 0
Potterton	4,014 15 0	993 10 0	5,008 5 0
Turtle & Appleton	3,880 0 0	1,060 0 0	4,940 0 0
Somerford & Son	3,965 0 0	892 0 0	4,857 0 0
Nightingale	3,771 0 0	1,003 0 0	4,774 0 0
Mitchell Bros.	3,849 10 0	873 0 0	4,722 10 0
C. Horsell	3,675 19 11	893 10 11	4,569 10 10
Gathercole Bros.	3,664 0 0	900 0 0	4,564 0 0
Stanly Ellis	3,604 0 0	916 0 0	4,520 0 0
Smith & Son	3,588 0 0	885 0 0	4,473 0 0
Vigor & Co.	3,442 0 0	997 0 0	4,439 0 0
Gaze & Son	3,536 0 0	883 0 0	4,419 0 0
E. Chamberlain	3,367 10 0	859 0 0	4,226 10 0
Higby & Rabson	3,370 9 0	850 0 0	4,220 9 0
Newland & Higgs	3,383 0 0	835 0 0	4,218 0 0
Hammond‡	Haslemere Builders‡		

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The Builder.

VOL. LXXXII.—No. 3068. APRIL 12, 1902.

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Pugin Studentship Drawings, R.I.B.A.: A Corner of the Doges' Palace, Venice; and Doorhead, Caudebec-en-Caux ..... By Mr. C. Wontner Smith.

Grissell Medal Drawings, R.I.B.A., 1902: Design for Roof of a Picture Gallery ..... By Mr. Lionel U. Grace.

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Diagrams Illustrating Ancient Circular Churches ..... Pages 358 and 359 | Illustrations to Student's Column ..... Page 375

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Furness Abbey, Lancashire.

THE planning of the remains of the various monasteries that lie scattered throughout the length and breadth of the country, and the careful excavation of buildings and foundations hitherto hidden, forms, perhaps, the most fascinating branch of purely architectural archæology. Of late years a good deal has been done in preserving ruins that had fallen into decay, or were threatened with early destruction if not carefully examined and preserved. The great growth of ivy, often a very picturesque feature in itself, has been in many cases removed, and its removal has no doubt preserved for many generations to come what in all probability would not have lasted much beyond the present one. The name of Mr. W. H. St. John Hope has been closely identified with the revival of this work, with the careful planning and excavating of these interesting buildings, and the work on Furness recently published is a further addition to the already valuable work that has been done by him.*

The carefully-written papers or monographs lately contributed by him on Castle Acre and Fountains have been in the first instance published in the proceedings of the Archæological Societies in whose counties the remains stand, and the present work originally in like manner appeared in the proceedings of the Cumberland and Westmoreland Archæological Society, and is now published in book form, with several additional illustrations.

The author contributed an interesting account of the ruins to the *Builder*, January 6, 1895, when Furness was illustrated in the series of "Abbeys of England and Wales." Before that date a certain amount of work had been done in clearing the site of the church—indeed, as far back as sixty years ago something had been done, although it was only in 1881-2 that the cloister and the interesting buildings that surround it were dealt with. By far the most important work of arriving at the meaning of the complex series of buildings dates from September, 1896, and it was continued in the corresponding months of the two following years under the auspices of the county Archæological Society, and under the personal direction of the author.

The chief feature of Mr. Hope's book, and its most valuable one, is undoubtedly the large ground plan, in which no less than ten colours have been used to denote the various dates of the buildings—a great assistance to the reader in properly understanding, so far as it is possible to say with certainty at the present time, the numerous alterations and additions that took place between the foundation in the early years of the twelfth century and the suppression in the sixteenth. In many ways the plan followed the general lines so characteristic of the great Cistercian houses, and the simple form of the church, with its transept chapels, the position of the choir, pulpitum, and nave altar, the great buildings on the east and west respectively that formed the dormitories and their substructures of the monks and *conversi*, and the frater placed at right angles with the church on the further side of the cloister, will recall in general arrangement the abbeys of Kirkstall, Rievaulx, Byland, and Buildwas, and many others. Three or four points, however, are of considerable interest. Quite recently (in 1900) the foundation of part of the original church has been unearthed, showing that before the church assumed its Cistercian form an older building, with apsidal chapels to the transepts, stood on the site; and although, perhaps, the early work was never carried very far, this interesting discovery has added much value to the plan. On account of the existing buildings, the sacristy, so generally found at the end of the transept, here forms an aisle to the presbytery, and the book cupboard, which often was in line with the sacristy but divided from it and approached from the cloister only, here occupied two large recesses flanking the entrance to the great thirteenth-century chapter-house.

The alteration on the south side of the cloister wall entailed the demolition of the original frater, which, apparently, had been placed parallel with the church on the Benedictine plan; the cloister was enlarged by the breadth of this frater, and its south wall was retained, and formed the outer wall of the new cloister. This was pierced and the new frater was built north and south in the usual Cistercian manner. The description and plan of this part of the buildings is one of the most interesting in the book, and shows with what care an attempt has been made to solve the difficult problem of the amount of rebuilding that evidently took place here at two or three subsequent dates.

Forming roughly a semicircle round the buildings that immediately surrounded the cloister was a group of hardly less important buildings, one at least of which—the Great Infirmary or "Farmery" Hall of the monks—was of great size. Much has here been levelled even to the foundations, but enough remains to have enabled Mr. Hope to restore its general dimensions and arrangement on the ground plan. Other buildings were the abbot's house, itself formerly to all appearances an infirmary; a third infirmary for the *conversi* near the south-west angle of the buildings on the west side of the cloister; while north of the church was a porch and enclosing wall to the cemetery, and at a distance of about 400 ft. the Great Gatehouse, an outer precinct gate with a chapel adjoining, and a third gatehouse on the western side.

Besides the valuable ground-plan are several collotype illustrations from photographs by Mr. H. Brakspear and some sections and details of the early presbytery floor and the infirmary hall. A large number of steel engravings are added, originally prepared for Beck's "Annales Furnesienses," giving views of the various parts of the ruins as they then were, the monumental effigies and slabs, and one or two sections through the chapter-house. These, in many cases, good examples of engraving add to the artistic excellence of the work; but from a strictly architectural point of view, and with the elaborate ground-plan already described, the value of the volume would have been still greater if more measured sections and elevations could have been given. The reader of Mr. Hope's elaborate architectural notes on the buildings would also find it more convenient if the plan had been mounted and inserted in a pocket, so that it could be spread out before him to refer to;

* The Abbey of St. Mary in Furness, Lancashire. By W. H. St. John Hope, M.A. Kendal: Printed and published by T. Wilson. 1902.

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Fig. 8.

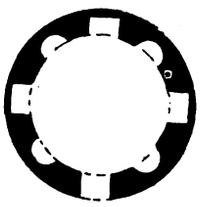


Fig. 11.

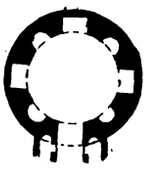
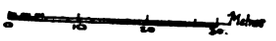


Fig. 12.



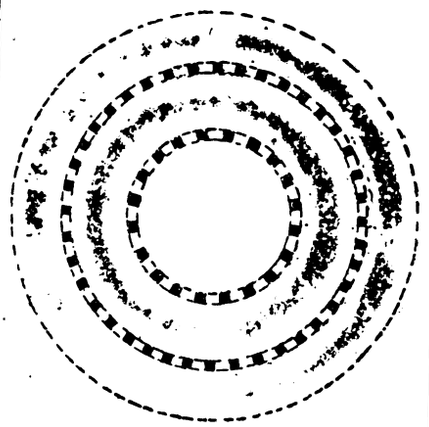


Fig. 10.

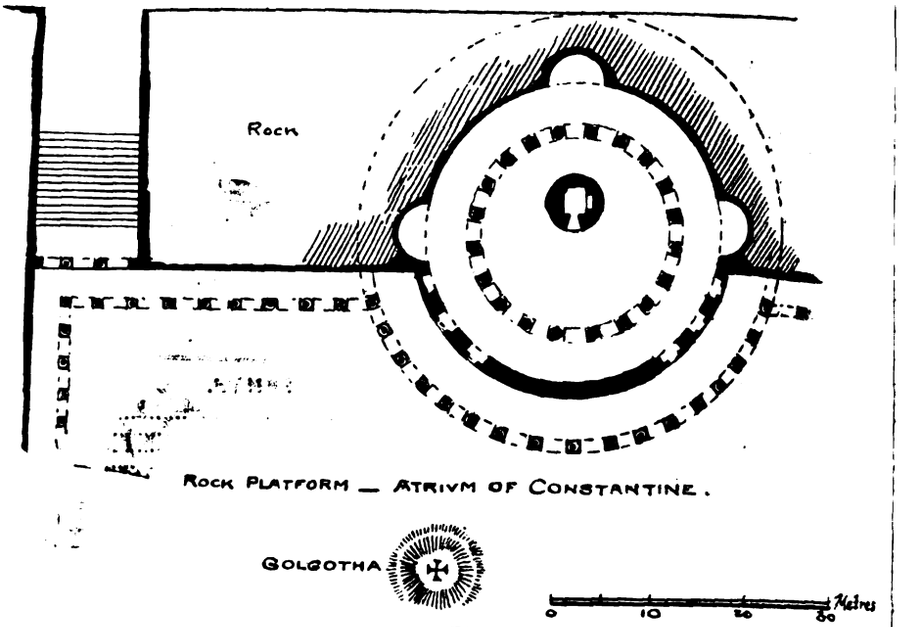


Fig 9.

8. Mausoleum of St. Luke, Ephesus (from Wood's "Ephesus").
9. The Anastasis, Jerusalem.
10. S. Stefano Rotondo.
11. Mausoleum of Helena.
12. Torre dei Schiavi, Rome.

to follow the intricate arrangement of the buildings is scarcely possible without constant reference to the plan. Apart from these points the work is excellent, both in matter and illustration, and it will be a valuable addition to the accounts of the abbey that already exist, bringing the description of the monastery more up to date than has been previously possible.

ANCIENT CIRCULAR CHURCHES.—II.

TURNING our attention towards the East, it would probably not be difficult to find numerous examples of circular Christian churches built in the early centuries, and, perhaps, before the time of Constantine. The late Mr. Wood, in his discoveries at Ephesus (1865), came upon a large circular building within the city walls, which he identified as Christian. His restoration on paper of this edifice would lead one to suppose it to have been designed in days when the classic style of art was at its zenith. It was a circular chamber 30 ft. in diameter, covered by a dome and with an encircling peristyle of the usual "Ionic order." Within the stylobate supporting this building was (apparently) a sepulchral crypt. Mr. Wood supposed this to have been the Mausoleum of St. Luke, which is said to have existed at Ephesus (fig. 8).

The regions of Asia Minor, where Christianity flourished particularly during the earlier centuries, are still very little explored. Amongst the innumerable deserted sites of once flourishing Roman cities many evidences of primitive Christian churches remain to be discovered, and we should expect to find the circular plan frequently adopted. The few remains of primitive times which have been identified seem to have attracted but little attention as yet. Syria possesses abundant examples of churches of the period subsequent to the publication of the Edict of Constantine, and many of them are remarkably well preserved. But of the earlier centuries very little has been discovered up to the present. The northern regions of Antioch and Edessa, where Christianity occupied so important a position from the very first, remain almost a *terra incognita*, and the same may be said for those districts still further to the north and east, which, according to Gibbon, were Christianised in primitive times. In the southern part of the country an absence of good building materials perhaps accounts for the disappearance of ancient monuments. This region has also been hitherto studied from a somewhat exclusively Biblical point of view by the Protestant archæologists, whilst the work of the "Société Latine" is almost confined to Mediæval history.

The greatest politico-religious change the world has ever seen was certainly when the Imperial Government of the fourth century decided upon the recognition of Christianity as one of the religions of the State. From this period onwards the monuments which mark the gradual development of religion, and, perhaps, the decay of taste, at least in a classic sense, are merely historical. As to circular churches, it is interesting to observe a new element which accounts for the survival of such a plan during and after the fourth century. Traditions of the early circular church may survive in this later development, although an "oblong" form seems to have been imposed upon church builders by such early documents as the "Apostolic Constitutions." The new development here referred to arose from a sentiment for reproducing the circular form of the church of the Holy Sepulchre in Jerusalem (fig. 9).

The circular construction enclosing the rock-cut shrine of the Holy Sepulchre or Resurrection (Anastasis) in Jerusalem is, of course, the most famous, and remarkable of all Christian (and at the same time circular) churches in existence. It is in a sense the centre of the whole system, and seems to symbolise after the manner of the more ancient Temple of Vesta, a concentric idea of the universe. (Vesta eadem est quæ terra subest vigil ignis utrique significant sedem terra focus quæ suam. Cic.) Certainly, it has been the focus of all Christendom—Roman, Greek, Armenian, or African—throughout all ages, and even in these latter days it has attracted a certain amount of Protestant controversy. As a matter of fact, we know the actual history of this monument as far back as the time of Constantine, before which date nothing of an important character would appear to have existed on the site. This site in a most remarkable degree retains the original planning and disposition of the famous monument of the fourth century (fig. 9). The plan which we here present agrees in the main with received theories, and, what is of still greater importance, with the actual measurements of existing vestiges and remains, and with the contemporary evidence of Eusebius, Cyril, and other undoubted authorities. The only portion of the combination of Basilica, Anastasis, Exedræ, &c., constituting the magnificent monument erected by the Emperor Constantine which concerns the present subject is the circular church or enclosure of the tomb. It must be remembered that in its origin this circular enclosure did not constitute a covered-in "church" in the usual meaning of that term, but it seems to have resembled the colonnaded *impluvium* of a Roman house of a circular form. This peculiarity in the structure of the building by which the sacred relic of the tomb was left exposed to the open sky was religiously preserved throughout the ages, and not until the Russians in 1870 constructed the modern iron-girder dome was the church completely roofed over with a glass skylight. The water gargoyles on the roof of the tomb of the beginning of the nineteenth century still remain in position, although no longer of any use.

Jerusalem has a particular local character

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attaching to its religious monuments, perhaps more reminiscent of ancient Egypt than any other country. The enclosure and decoration of the holy sites ordered by the Emperor would be confided to the workers in the local style of which we see so many examples in the Valley of Jehosophat and at Petra. The so-called "Tomb of Absolom" or "Pharaoh's Cap" tomb under the eastern wall of the city is probably very much like the original design of the Holy Sepulchre, but without the colonnaded porticos. In a precisely similar manner the rock-cut chamber was treated as the interior of a block of stone, carved out and freed from the cliff or mountain side by a space of considerable width. In this way the cube of rock assumed the appearance of a one-roomed hut or shrine. Many other examples of such a treatment might be instanced in addition to the "Pharaoh's Cap." In the case of a similar tomb in the village of Siloam the rock-cut interior has been occupied as a house for untold generations, and the surrounding space detaching it from the hillside has been filled with additional chambers. At Petra there are countless examples of this treatment, but nothing carried out with the magnificence of the Holy Sepulchre. By studying such examples we may, perhaps, form some idea of Constantine's work in Jerusalem, of which not a fragment of carving or decoration remains in the Anastasis, although the lower part of the Basilica is to a great extent preserved. They seem all to belong to the period of the Roman Empire, when the decaying taste in purely architectural form combined with inappropriate ornamentation, and a desire for mere display produced the strangest creations, many of which remind one of the extravagant piling up of meaningless details in shell grottoes or Dresden china architecture. Broken pediments, imitation arches, clumsily-imitated columns, and misunderstood details of actual construction hewn out of the solid rock give an impression of depraved taste which it would be difficult to parallel, even with the "ignoble grotesque" of the seventeenth century. Such work exhibits the inherent inability of the Arab and Levantine races, which occupied the district at that period much as they do at the present day, to do more than clumsily copy from Western civilisation whenever they wished to produce anything of a monumental or decorative character.

The style of art and decoration employed by Constantine, although of this deplorable local character, would in the case of the Holy Sepulchre be redeemed to some extent by the scale of the monument. To judge by the fragments remaining of the east front of the Basilica, the general scale of the buildings was imposing—the colonnades surrounding the tomb would probably be about 40 ft. in height. The western half of the inner colonnade served to screen the rock face where it had been excavated to the semicircular form with three small apses as shown on the plan, leaving the Sepulchre as a detached block on the chord of the semicircle. Towards the east the completion of the circular boundary was formed by a wall with doorways therein, as the careful description of the monument by the pilgrim Sylvia of Aquitaine (fourth century) contains references to the sound of voices heard *within* the Anastasis from outside. It is a little difficult to understand how the enclosing wall lines were carried entirely round the tomb in spite of the difference of level between the rock platforms on the east and west sides. This difference was perhaps surmounted by making the eastern wall of a sufficient height for the cornice or coping to range all round*. In the ancient representations of the buildings during the fourth century only the tomb itself is ever shown, being the object which would naturally attract the attention of the artist under the circumstances.

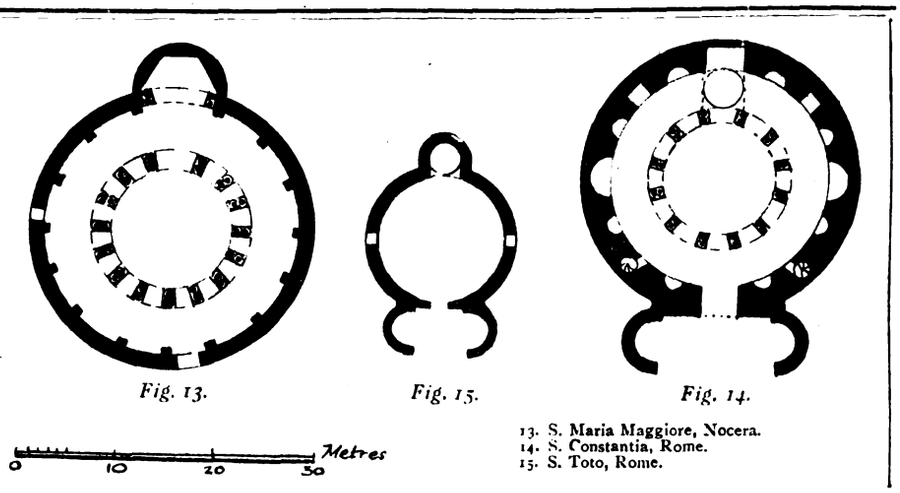

Fig. 13. *Fig. 15.* *Fig. 14.*

13. S. Maria Maggiore, Nocera.
14. S. Constantia, Rome.
15. S. Toto, Rome.

For the present purpose we are hardly concerned with the Church of the Holy Sepulchre in its primitive state, and its connexion with the interesting early examples of round churches in Rome, and elsewhere, above referred to would be hard to define. At first the circular colonnade was intended merely to form a glorified enclosure of the precious shrine in the same way as a similar circular roofless church was built around the traditional site of the Ascension on Mount Olivet. But at a much later period, after the barbarous transformation during the dark ages succeeding the fall of the Roman Empire, when the colonnades were walled up and a roof constructed over it, it became the model for innumerable round churches scattered over the face of Europe, as far north even as Trondjem. One of the most important copies, representative of a particular period when such copies were most in vogue, is the tomb-house of Charlemagne, at Aix-la-Chapelle. The more or less documentary history of the great Emperor and of his relations with Haroun-el-Raschid on the subject of Jerusalem, have a bearing on the subject. The eighth and ninth centuries would seem to have been a period during which the circular form of church became again fashionable, and, as a rule, examples belonging to these and later centuries are merely intended to be copies of the Holy Sepulchre Church of Jerusalem in its eighth century condition.

In Spain the arrangement of the choir in the centre of the cathedral, instead of at one end of the building, seems to suggest an earlier style of church plan. In the earliest Roman basilicas the same idea seems to survive; but, of course, in all such cases the buildings are of a square plan. In the interesting octagonal church of S. Giovanni dei Cavalieri, Pisa, the altar remains in the centre of the circular space in the same way as in S. Stefano Rotondo, Rome.

The circular or octagonal baptistries scattered over Italy naturally come under the head of circular churches, but with few exceptions these buildings are traditionally said to have been built for the specific purpose of baptism and as mere adjuncts to square churches. In the Middle Ages such buildings were always fitted up internally with immense fonts, which prevented their use in the ordinary way of a church.

Returning to the more immediate subject of this article—namely, the circular church of Early Christianity, several examples of types unlike the "Torre dei Schiavi" or the "Tor Pignaterra" must be referred to. The Church of S. Stefano Rotondo on the Cœlian Hill, Rome (fig. 10), has been called the "Sphinx of the Cœlian," and its origin remains still a puzzle to some students. Guesses have been made that it was originally built as a circular market, but there is neither evidence nor tradition that it has ever been used for any purpose but that of a church. It is here suggested that a probability exists of its having been originally intended as a copy of the Anastasis in Jerusalem. Its dimensions and the disposition of its inner colonnade bear out this suggestion. At a subsequent period it, like its prototype, was covered over with a wooden roof; at Jerusalem this roof was constructed in some ingenious manner of which no record remains; at Rome it was supported in a clumsy way by a pair of tall columns with arches, which have a particularly barbarous effect. The outer walls and other portions of S. Stefano were much remodelled at the same time the central portion was covered over. In comparison with the great church of S. Stefano, the plans of the two ancient churches of Helena and the "Slaves," already described, are here shown reduced to the same scale (figs. 11 and 12).

Another type of early circular church is represented by S. Maria Maggiore, Nocera (fig 13), and S. Constantia presso S. Agnese fuori la Mura (fig. 14), and S. Toto, or Theodore in the Forum, Rome (fig. 15). The first of these is supposed to have been the Cathedral of Nocera, near Naples, afterwards turned into a baptistry, a destination to which many other circular churches were probably consigned when the requirements of a later age involved the erection of more important buildings as cathedrals.

S. Constantia, Rome, is perhaps one of the best preserved of these early buildings.

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* In a somewhat similar way the modern "Holy Sepulchre," or "Gordon's Tomb," is now protected by a wall which passes all round it, carried along the upper part of the cliff to prevent people from falling over from above.

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The position of the altar seems defined by the fact of a large sarcophagus having originally stood behind it, the outline of which is preserved on the floor with a marble border. The well-known decorations of this church belong to a period which is certainly earlier than the time of Constantine, and it is curious to notice certain features in the architecture which recall the debased style of the Levant, such as the curved friezes and vine leaf decorations. It is sufficiently evident this circular church was built in connexion with the adjacent catacombs, and at a later time the Basilica of S. Agnese was added to the group of buildings, but there is no evidence beyond tradition as to the dates of either.

As a result of the above notes upon this very obscure subject we may, perhaps, conclude as follows:—

It would seem that during the first three centuries of Christianity churches were built in spite of possible persecutions, and whilst events were maturing which eventually turned the whole known world over to the Christian religion during the fourth and fifth centuries. Diocletian is accused of having destroyed a conspicuous Christian church which interfered with the view from his palace windows, and from various evidence we are led to suppose the Christians, with whom the Emperors of the early centuries were desirous to curry favour, would not be content to suppress and conceal all outward display of their religion.

Previous to the so-called "Peace of the Church" in the fourth century, the Christian records of whatever kind are confessedly traditional; and, indeed, for many centuries after that event they have but little better authority; it is therefore hardly to be expected that comparatively minor details of history such as the building of small churches should survive. In as far as traditions do survive of the use of certain buildings as churches, they are as good history as any other of that period.

It would seem that where the earliest church builders had an intention to honour a hero or martyr in the sense of a monumental building dedicated to his memory, they adopted the common circular form of similar Pagan tombs or monuments. This did not, of course, exclude the square form, which may have been more generally in use, but did not constitute so monumental a structure, nor so easily escape the modifications of later times.

Apropos of the subject, an ancient tradition may be referred to which records that a certain church of Rome was known in these early centuries as the "baker's oven"—could this name have been applied on account of its circular form? G. J.

NOTES.

The Glasgow Disaster.

WHEN a deplorable event occurs, such as that witnessed last week in Glasgow, representatives of the daily press seldom find time to collect exact details of the kind which interest architects and engineers in a technical sense. At the present moment we are all awaiting information of a precise nature as to the construction of the western terrace at Ibrox Park. Judging from the most reliable reports, it appears that the structure consists of steel stanchions, placed 12 ft. apart in rows which are also 12 ft. apart, supporting longitudinal steel girders, while timber joists extend from girder to girder at intervals of 3 ft., being secured at each end; and, finally, the timber joists are covered by a flooring of battens. In addition to the above, it seems that the structure is braced, though in what manner and with what material we do not yet gather. One circumstance stands clearly out in all accounts of the disaster, namely, that the steelwork remains intact, and that the direct cause of failure was the rupture of some timber joists, which broke in the middle, the ends remaining attached to the steel girders. Moreover, only one section of the floor—about 70 ft. long by 12 ft. wide—system collapsed. Assuming the correctness of the foregoing data, two alternative suggestions present themselves—(1) that the crowd on the undamaged portions acted as a live load of normal character, while the surging mass which swept down the barriers where the collapse occurred acted as a live load of unusual potentiality, overcoming the transverse resistance of sound timber possessing average strength, or (2) that part of the flooring must have contained material that was originally weak, or had deteriorated since its erection. Light will be thrown on these points by the official inquiry shortly to be held, and we shall then probably learn what was the calculated load per square foot, whether due allowance was made for the vibratory and oscillatory stresses inseparable from the movement of a densely packed and excited audience, and whether an ample factor of safety was applied in connexion with the design of the structure. The average weight of a crowd is variously estimated. Some engineers consider 80 lbs. per square foot ample, and others place the maximum weight at nearly 150 lbs. in the same area. In the opinion of bridge engineers, the stresses caused by marching men are fully double those produced by an equal number of persons standing at rest. Therefore it might be necessary to assume the effect of live load on a stand such as that at Glasgow, and with so excited an audience, to be equivalent to 300 lbs. of dead load per square foot. Again, the sudden stoppage of a moving mass of people by barriers or by the crowd in front would inevitably cause severe strain to any structure. Whether sufficient allowance was made for factors such as these we cannot say, and it would be manifestly unfair to prejudge the case in any way. Full information on all essential points will no doubt be forthcoming in due time.

The Rating of Machinery.

WE cannot but think that the recent case of Crockett & Jones *v.* Northampton Assessment Union emphasises the necessity for some such measure as the "Rating of Machinery Bill, 1902," which passed the second reading in the House of Commons this week. The object of the Bill is to exclude certain machinery and appliances, not fixed or only so fixed that they can be removed without necessitating the removal of any part of the hereditament, from being taken into consideration in ascertaining the rateable value of business or manufacturing premises. For many years this principle has been pressed upon the courts, and physical annexation alleged to be the test as to what machinery should be taken into consideration; but it has always been negatived, and in the case of Tyne Boiler Works Co. *v.* Overseers of Longbenton, it was laid down that all things on the premises necessary for the purpose of making the premises fit for the business for which they are being used—or, in other words, all such things as would pass in a demise of the premises as a going concern—are to be taken into account. Such machinery, however, as will be seen from the decision in the case now decided, is not to be separately assessed, and how its presence increases the rateable value of the premises is in each case a question of fact. This question of fact, it is apparent on the face of it, is extremely difficult of determination, yet in both the above cases the courts declined to give any direction as to how it was to be arrived at; hence it is of advantage that a measure should be passed removing this difficulty and consequently ensuring a greater uniformity and equality in assessment.

Wireless Telegraphy.

THE agreement entered into last month by the Canadian Government with the Marconi Companies to establish a Transatlantic wireless telegraphic service proves that Canada is fully alive to the possibilities of the latest development in telegraphy. The great advantage that this system has over the regular cable system is the small amount of capital required. The Canadian Government agrees to pay the Marconi Companies 16,000*l.* to build a wireless telegraphic station in Nova Scotia, and the companies agree not to charge more than 1d. a word for messages between Canada and Britain. At the present speed at which wireless telegraphic messages can be sent, not much profit can be made at this rate, and the revenue of the cable companies will be practically unaffected, but there are great possibilities of development. From a theoretical point of view, the difficulties in the way of sending Hertzian waves round the curvature of the earth seem insuperable, yet we believe that in a few months regular communication will be established between this country and America by Marconi's apparatus. The "timing" of these messages will have to be done with considerable precision, as otherwise it is difficult to see how these signals can avoid being registered by the wireless instruments which are now carried by numerous Atlantic liners. The Canadian Government contemplate the possibility of setting up Marconi stations on lighthouses and life-saving stations on the coast. It seems to us that the difficulties in connexion with wireless telegraphy will increase rapidly as the number of stations is increased, but with the improved apparatus now in use there is no reason why the spheres of action of two or three should not overlap.

Fall of a Concrete Floor.

THE collapse of a concrete floor last week at Messrs. Guinness's brewery in Dublin serves as a reminder of the very limited transverse strength of concrete when not reinforced by iron or steel. The floor in question formed part of a disused malthouse which was in process of alteration, and the accidental breaking of a supporting column was immediately followed by the fall of the floor, unhappily killing three men who were in the room below. We do not at present

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know the exact details of construction nor the condition of the floor, but apparently the concrete was whole, for it was observed to break into four parts during the collapse. A concrete floor supported by steel joists and girders feels and looks so strong that a natural tendency is to forget that the element of transverse strength exists almost entirely in the steel work. Very few data as to the transverse strength are available, amongst the most reliable being those obtained by Mr. Bruce, M.Inst.C.E., in connexion with the Glasgow waterworks. From these it appears that the modulus of transverse rupture for concrete, as ordinarily used, and at the age of four weeks, cannot be safely taken at more than 80 lbs. per square inch. Comparing this value with the average values of the co-efficients for other familiar materials of construction, some striking differences become evident. One or two simple calculations will show that a concrete slab can only be safely employed for carrying load in addition to its own weight when the distance between the points of support is comparatively small. In fact, the span is soon reached when the slab is incapable of supporting its own weight. This truth has been demonstrated in a most unfortunate manner by the accident in Dublin.

Protection of Lift-shafts.

As lifting mechanism is becoming more and more used in the equipment of modern buildings and dwelling-houses, it is particularly desirable that safety devices should continue to occupy the attention of inventors and manufacturers. One part of this subject has recently been under discussion by the Institution of Mechanical Engineers, when it was pointed out that comparatively few of the mishaps termed "lift accidents" are actually brought about by the failure of mechanism, the majority being due to carelessness on the part of the public or the attendants. This means that the lift-maker must provide against absent-mindedness and negligence as well as against defective machinery. To ensure the safety of lift-openings, it should be rendered impossible (1) for any door to be opened unless the cage is at rest opposite to it; (2) for the cage to be started until the doors are all closed and locked; and (3) for more than one door to be opened at one time. The conditions under which lifts are installed and worked are so varied that it is impossible to contrive any one form of apparatus satisfactorily meeting all cases, but numerous inventions of the kind are available for consideration. Several of these were described in detail by the originator of the discussion, including appliances actuated by movement of the lift itself or put into action by the attendant, and others actuated by hydraulic or electric power. One of the best systems for the protection of lift-openings appears to be the Hollins-Amendt electrical locking gear, and when this is employed the lift cannot be started unless all doors are closed and fastened, no door can be opened unless the lift-cage is opposite to it, and the starting rope must be locked before the door can be opened.

The Fencing of Engines.

In a short paper read before the Institution of Mechanical Engineers, Mr. Henry D. Marshall makes some practical suggestions with the view of diminishing the risk of accidents to the attendants of steam and gas engines. The common device of enclosing the engine within a rail is hardly sufficient protection, and guards should also be provided for all working parts, yet made so that access is afforded for oiling. Mr. Marshall recommends the adoption of automatic oiling appliances whenever practicable, and his paper describes and illustrates several useful arrangements of the kind. In the case of an engine where the flywheel or pulley is close to the wall, means of lubrication should certainly be fitted so that the attendant shall not be compelled to pass an oil-can between the spokes of the wheel, or between the wheel and the wall. The simple expedient of an oil-cup at the end of a small copper pipe will answer the required purpose, or a self-lubricating bearing may be used with satisfactory results. The author very properly insists upon the fencing of belting and fly-wheels, and the suggestion that projecting shaft-ends should also be guarded is a good one, for the rotating end —in which there is generally a keyway—is very apt to catch hold of clothing. For a case of this kind Mr. Marshall advises the use of a sleeve of brass, or other suitable material, the sleeve to be fastened to the fencing, or, where there is no pulley outside the bearing, to the side of the bearing itself. Fly-wheels should be boarded up on both sides or shielded by wire-netting secured to ordinary fencing, thus preventing anything from falling into the arms of the wheels. It is to be feared that the protection of small engines is too frequently left to be carried out after the equipment of a building, and the paper to which we refer certainly fulfils a useful purpose in directing attention to the subject.

A Memorial to Shakespeare.

CONSIDERABLE notice has been taken of the proposal, propounded by Mr. T. Fairman Ordish in a letter to the *Times* of March 29, to erect a memorial in London to Shakespeare. Thus far the project takes the form of a playhouse for which the London County Council would be asked to give a site in their un-named street. An authentic reproduction of a sixteenth-century theatre, say the Swan or the Globe as they stood in the Bank-side, would form a very uncomfortable house for a modern audience, even if, as seems rather doubtful, it could be erected and used without contravening regulations now in force in respect of buildings frequented by the public. Nor is there any particular reason why the theatre should be erected in a part of the town which is not known to possess any association with the poet's residence or career in London. A copy of the Swan, entrusted to capable hands, would be in itself an object of archæological interest; we question whether it would constitute an attraction so great and lasting as to defray the cost of its erection and upkeep as an exhibition or, as some suggest, a County Council museum. On the whole, the proposal, however well intended, seems to us rather a foolish one.

The Artistic Side of Mr. Rhodes.

UNDER this heading Mr. Herbert Baker, who acted for some time as architect to the late Mr. Rhodes in connexion with "Groote Schuur" and, we believe, other buildings in which Mr. Rhodes was interested, has written an exceedingly interesting letter to the *Times* of Monday, the contents of which will surprise many who saw in Mr. Rhodes only a financier and a politician. According to Mr. Baker, who is an artist himself, and who must have had plenty of opportunity of becoming acquainted with Mr. Rhodes's feelings and opinions on the subject, the great South African diplomatist had the imaginative and artistic sense so developed in him that his whole life was influenced by it. He loved grand scenery; he loved old buildings, and did all he could to preserve the old colonial Dutch farmhouses, and built his own house in a style founded on theirs, as the most suitable to the country. He started a tile manufactory near Cape Town for the especial purpose of "killing the blight of corrugated iron"; he took pleasure in good honest handicraft, and liked having the metal-work of his houses handmade by local craftsmen. Mr. Baker hints at great architectural schemes which were in Mr. Rhodes's mind and might have been carried out in the future had he lived. All this is new reading to many of us; it shows that Mr. Rhodes was a man of much wider nature and sympathies than most persons had supposed, and we are indebted to Mr. Baker for giving this information in regard to one who, whatever his faults, was certainly one of the most remarkable men of modern England.

Basingwerk Abbey, North Wales.

WE read that the Flintshire County Council propose to take steps for preserving the ruins of Basingwerk Abbey, which stand upon an eminence, about one mile distant from Holywell, whence is obtained a fine view of the Dee, Hilbre island, Parkgate, Chester, and the Lancashire hills, and rising from the pasture land watered by a stream from St. Winefrede's well. The abbey was founded at a spot close to the northern end of Watt's Dyke, which may be traced in a south-eastward direction to Maesbury, near Oswestry, as early, it is believed, as the close of the eleventh century, and in or about 1131 was placed under the Cistercian rule by Ranulph, second Earl of Chester, who was a munificent benefactor of the foundation. The ruins, which present both Saxon (or Norman) and early English features, comprise remains of the church, the refectory, the monks' cells (each of which has a small window), a chapel added by King Henry II., and a half-timbered building which Grose conjectured to have been the granary. In the neighbourhood are the site of an ancient fort, known as Basingwerk Castle, and the dyke which Offa, King of Mercia, constructed from Newmarket, co. Flint, to Beachley, at the mouth of the Wye.

Gray's Inn Gardens.

SOME hopes had been entertained that the Benchers of Gray's Inn would agree to replace the high wall with a railing along the south side of Theobald's-road, now that the Holborn Borough Council are about to lay down Jarrah wood paving in Gray's Inn-road between Theobald's-road and Holborn Bars. It is stated, however, that the Benchers have decided, in the interests of residents in the Inn and of those who are permitted to frequent the garden, not to remove the wall which serves to screen it from the passing traffic. The wall conceals from view on that side a large expanse of turf, with walks and an avenue of elm trees originally laid out and planted by, it is said, Sir Francis Bacon, in

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the former Green-court and Panyerman's-close. The records of the Inn contain orders for the payment in 1597-1600 of certain sums and allowances—138*l.* 2s. in all,

"to Mr. Bacon for planting of trees in the walks, ... a supply of more young elm trees, ... a new rail and quickset hedge . . . . upon the upper long walk at the good discretion of Mr. Bacon and Mr. [afterwards Sir Roger] Wilbraham, ... and unto Mr. Bacon for money disbursed about the garnishing of the walks."

According to Sedding's "Letters and Life of Bacon," it was there that Sir Walter Raleigh held a long conversation with Bacon on the eve of starting for his second expedition to Guiana. Along the north side was constructed a raised terrace or mount. The summer-house which Bacon dedicated, 1609, to the memory of Jeremiah Bettenham, Reader of the Inn, was pulled down in the middle of the eighteenth century, and the subsequent erection of Verulam-buildings and Raymond-buildings somewhat diminished the area. The gardens at one time formed a highly-fashionable resort, especially, as Pepys records, on Sundays. They are now the haunt of a great variety of birds that are not commonly to be found in London.

An Absurd Pedestal.

THE *Daily Graphic* gives an illustration, in its Wednesday's issue, of a proposed monument to Goethe to be erected at Rome as a gift from the German Emperor. The statue of the poet is placed on an immense Corinthian capital, with a base added, as if the column had been cut away and the capital and base used up as fragments. Groups of figures (on a different scale from the principal figure) flank the capital. A more absurd misuse of an architectural feature could not be imagined; but this is the design of a German sculptor, Professor Eberlein; and the Emperor "is greatly pleased with it." So much for German artistic taste.

The New English Art Club.

THE exhibition of the new English Art Club at the Dudley Gallery contains, among its collection of unfinished pictures and studies of the ugly, some really good things. Among these is Mr. Furse's fine portrait of Miss Vanessa Stephen (85), her side-face partly reflected in a mirror before which she is standing; a fine work both in character and colour. His half-length portrait of a man (82) is also a powerful work. Near to these Miss Alice Fanner makes a notable success in her "Sketch of a Country Road on a Windy Day" (88), with the clouds flying, trees bowing in the wind, and the line of white posts glittering in the middle distance sunlight; a bit of landscape effect worthy of Constable, and quite in his way. Mr. W. Russell's landscape under the name of "The Lame Horse" (95), and his "Chepstow Castle and Town" (100) are spirited but somewhat rough and "painty" studies; in his interior with a figure, "The Mirror" (118), he shows fine colour and an interesting and pleasing figure. Among landscapes may be also mentioned Mr. Rich's slight but excellent little sketch of "Ipswich Harbour" (7); Mr. Clarkson's "Duckpond" (52), which looks however rather like an inspiration from Mr. Mark Fisher; Professor Brown's "Showery Weather" (54); Mr. Muirhead's "The Avenue" (55), and Mr. Henry's boats "In Winter Quarters" (57). Among other subjects Mrs. Clarke-Hall has an excellent bit of foreshortened figure study (42); Mr. Orpen's "The Valuers" (56) is exceedingly clever and equally repulsive (though in this sense there are much worse things in the room); Mr. W. Rothenstein's "The Amateur" (62) is a study for what would be a very good picture of Mr. Marks's figure and bric-à-brac type—but Mr. Marks used to finish his; and Mr. R. E. Fry makes a curious study of "A Baroque Façade" (70), bastions in the foreground and in the rear an Italian Renaissance building with violently posed statues on the roof. As to various other things in this curious collection, we remember a small "Study of a Head" which ought to do for Bill Sykes; a half length portrait of a lady, defiant in its ugliness both of expression and colour; and two nude studies, one of them so ugly and ill-drawn as to look like a bad joke, the other hardly decent in its prosaic suggestiveness. If this is "new English art," one may well say, "The old is better."

Mr. Simpson's Water-colours.

THE collection of water-colours of East Anglian landscape by Mr. Tom Simpson, at the Modern Gallery in Bond-street, contains a great deal of very pleasant work of, it must be admitted, a rather mannered type, but it is a refined and artistic manner. Mr. Simpson's roads, for instance, seem all to be the same colour—a selected tint. But he is very successful in conveying the character and feeling of the rather blank and desolate scenery of the East Anglia flats and coast scenes. Among the best in this respect are "Opposite Bradwell Point" (13) and "Joyce's Head" (18). The collection is worth a visit, though its interest is of rather a restricted kind; one drawing is very like a good many others.

Landscapes by Mr. Montague Smyth.

AT Messrs. Dowdeswells' Gallery there is a collection of landscapes in oil and water-colour by Mr. Montague Smyth, which are of rather exceptional excellence. Mr. Smyth at all events is no mannerist; he has two or three favourite classes of subjects, but he does not repeat himself; and he has that power of giving unity of composition and effect to a landscape, as if it were the expression of a single governing idea, which raises landscape really to the level of ideal art. As examples of this may be named his beautiful little composition "A Welsh Pastoral" (9); "June Flowers" (14), which quite suggests Corot; and "Gathering Wild Flowers" (20), a work of the same class. Among the others we were particularly struck with one entitled "Low Tide" (45), a small picture with a kind of abstract power and largeness of style about it which makes it impressive to a degree quite out of proportion to its limited scale.

THE ROYAL HORTICULTURAL SOCIETY.—This society, having lately inspected five sites in Westminster, have decided to acquire one in Vincent-square, at the corner of Bell-street. The area of the site, which belongs to the Ecclesiastical Commissioners, is 17,565 sq. ft., and the rent amounts to 690*l.* per annum for a term of 999 years. The society propose to erect a central hall, with offices, library, and a hall for floral exhibitions and kindred purposes, at an estimated outlay of 25,000*l.*, towards one-third of which subscriptions have already been made.

MAGAZINES AND REVIEWS.

THE *Art Journal* gives as its frontispiece an etching of the Houses of Parliament by M. Brunet-Debaines, but the building is only used as an element in a moonlight effect (we presume it is intended for moonlight), and is rather maltreated. Mr. Claude Phillips continues his articles on the Wallace Collection, treating in this number of the French pictures, and giving illustrations from Prud'hon, Ary Scheffer ("Paolo and Francesca"), and including the beautiful "Villa Doria Pamphili" of the last-named artist; of its true power, however, no idea can be formed apart from the colour. We wish Mr. Phillips could tell us what has become of the best of all the Decamps that Sir Richard Wallace had, viz, "The Patrol at Smyrna." We remember it when his collection was exhibited at Bethnal Green, but it is not at Hertford House. The second part of Mr. Austin Dobson's article on Kate Greenaway is accompanied by a profusion of little sketches that are exquisite, as Miss Greenaway always was when she kept within the province of art for which she had a special faculty; when she went beyond that and attempted pictures she failed. Mr. Charles Quentin contributes an article on Rodin's latest works, of which "Les Nuages" is a really fine conception; the article is written in the vein of adulation for this unequal and erratic sculptor which is now the fashion. The *Easter Art Annual* connected with the *Art Journal* is devoted to the life and works of Rossetti. The illustrations are numerous, and present some designs that are little known. It was a right choice to give a whole plate to the little triptych of "Paolo and Francesca," for all that is strongest and most individual in Rossetti's art is symbolised in this work. The article is written by a lady relative of the painter, and therefore one cannot very well expect to find an impartial critical estimate in it. Rossetti was well worth a special publication of the *Art Journal*, but his paintings will not ultimately take the place that his friends and admirers expect.

The *Magazine of Art* devotes an article to the art and the works of Mr. Somerscales, a sea-painter who not only paints the sea with great force and power, but who understands sailing-ships as no other English painter understands them. We are not surprised to learn from the article that he has been many years constantly at sea, not however either as sailor or artist, but as a schoolmaster in the Royal Navy. Painting as his main work came as an afterthought, and certainly he has made fine use of it. A long article on the work of Miss Fortescue-Brickdale is illustrated by a variety of reproductions from her studies, including figures, animals, and farm buildings, all equally well treated. Under "Notes" is given a small illustration of a part of the London County Council Engineer's design for Vauxhall Bridge, and under it a similar portion of Mr. H. H. Statham's suggested design; the two reduced to the same scale. We recommend this comparative illustration to the notice of those who are interested about the treatment of Vauxhall Bridge; we think it will be admitted that the two form a rather effective object-lesson.

The *Artist* seems to have started a new *format*, though not a new series. It presents a new cover, not quite as good a piece of design as an art paper should show, and special designs on a dark brown paper as headings to the principal divisions of the number—either decorative designs or special coloured illustrations. These are mostly very good. It has also added a department of musical criticism to its contents. A paper on Holbein by Mr. Bensusan, very well illustrated, forms the first article; followed by one on the work of Mr. Moffat Lindner, who, though mostly known in exhibitions as a landscape painter, interests us by a number of very good though slight architectural sketches introduced as illustrations to this article. "A River-side House," designed by Mr. H. Seton Morris, is the subject of an article and illustrations; though a nice little house in the "civilised hut" style, it was hardly worth making the subject of an article. We notice that in some of the art papers there seems to be no interest in architecture except in the form of a civilised hut—as if this kind of thing specially represented the artistic side of architecture; which is surely not to be admitted.

The architectural illustrations in the *Berliner Architekturwelt* are more interesting and (to the English eye) less eccentric than usual.

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Two or three competition designs for the reconstruction of the Exhibition buildings at Berlin show some striking architectural conceptions. The new Rathhaus for Schmargendorf, by Herr Otto Kerwein, is an effective feudal-looking building; and the apartment-house in the Matthäikirchstrasse, by Herr A. Messel, shows a sober and dignified treatment rather belonging to the old than to the new German school of architecture. The latter is represented by MM. Meier and Werle's "Villa Swoboda" at Steglitz, with a clever plan and an architectural treatment that is at all events not commonplace. Herr Lederer's public fountain for Breslau is a fine conception; though rather coarse in detail, it represents some of the best qualities of German sculpturesque design.

The *Monthly Review* publishes the first part of an essay by Mr. T. A. Cook, under the bewildering title "The Shell of Leonardo," the object of which apparently is to prove, or rather to show it probable, that Leonardo da Vinci was the architect of the celebrated spiral staircase at Blois, and that he took the idea from the construction of a spiral shell. The present article is entirely occupied with the rather unnecessary process of showing that there are many spiral forms in nature, which no one ever questioned. All this seems a revival of the old fallacy of architecture derived from natural forms, which no one who has studied the development of architectural structure can ever believe in, except merely in regard to a certain amount of decorative detail. Structural forms in architecture are developed by structural problems involved in the very act of building. It does not seem to have occurred to the writer of the article that if a staircase is enclosed in a circular turret—a favourite form from its concentration in regard to spacing—the lines of the ascending steps necessarily form a spiral; every common circular turret staircase is a spiral; that at Blois is only one more boldly constructed and more artistically treated than most others. The article is, in fact, one of those faddist articles about architecture with which English literary editors—than whom no class of educated persons are more ignorant of and indifferent about art—are so liable to be taken in.

The illustrations in the last issue of the *Architektonische Rundschau* present nothing of special interest; the front of a house in the Lützowplatz at Berlin, by MM. Kristeller and Sonnenthal, shows that there are still architects in Berlin who can appreciate a broad and severe Classic treatment of a house front, and of its class this a very good design, owing much of its effect to the contrast between plain rusticated treatment of the lower two stories and the graceful applied order above. English architecture, as usual is entirely ignored in the so-called "Rundschau."

In *Macmillan* Mr. Lewis F. Day writes a paper on "Art and Life," an exceedingly sensible and well-balanced consideration of the relation of the artist and the artist life to society at large. While holding that an artist to do his best, must keep his life to a great extent free from the bondage of many social conventions, Mr. Day is broad-minded enough to realise that there is such a thing as over-acted and insincere Bohemianism, and that the artist who assumes an attitude at war with society and life as it is lived, is apt to lose more than he is aware of. Coming from an artist, the paper is a very good and well thought-out criticism of the relation of the artist to society.

The *Nineteenth Century* contains an article by Dr. Edridge-Green on "Colour-blindness." According to him there are two classes of colour-blind persons—those whose sight loses light as well as colour, and those whose light perception is normal but whose colour-sense is deficient. The article deals only with the latter class. The writer had a very exceptional opportunity of studying the subject with the assistance of a patient who was colour-blind with one eye, but not with the other. This enabled him to compare the appearance of colours as seen by the colour-blind eye with the actual (or usually perceived) colour. The difficulty in getting at the appearances of colours to colour-blind people is that they do not know how to define the shades or tones they see with reference to actual colour which they have never seen. The most interesting point in the article is the conclusion which the author has drawn from his studies of the subject, viz., that the perception of colour is an acquisition of civilised man; at all events that it has very much developed ever since the days of Homer, taking account of the small number of colours mentioned by him (or it). The practical side of the article is that Dr. Eldridge-Green finds that only a minority of persons can see all the colours of the spectrum; those who are "pentachromic" or "tetrachromic" (who can see five or four colours) he classes as normal. He mentions that in the ordinary tests employed by railway companies and the mercantile marine those who are trichromic are allowed to pass; but, he says, "This is not right, as those who are trichromic are always in difficulty over yellow, though they distinguish red from green easily enough." This is, or might become, a very serious matter, considering that engine-drivers have to govern their movements by the difference between red and what, though called "white" lights, are practically yellow.

In the *National Review* Mr. W. Robinson, under the title "The Garden Beautiful," criticises Mr. Inigo Thomas's book on formal gardens, from the usual landscape-gardener's point of view, and says the usual things on the subject which landscape gardeners always say—"Is not this our craft in danger to be set at nought?"

In the *Century* an article on "The Beautifying of Village and Town," by Mr. Sylvester Baxter, is chiefly interesting to English readers as giving evidence of a new movement in this respect in the United States. The writer seems to imply that there is much to be done in this direction in America, and that there is an awakening of public opinion on the subject. He gives a sketch of "a commonplace village street" and of "a well-ordered village street"; they are effective contrasts, and we presume the latter sketch, with its wide margins to the roads and its trees down the roadside, represents an ideal to be aimed at. But in many country towns and villages in England this kind of "well-ordered village street" can be found as a natural growth; it has made itself, without any theories or ideals at all. In our large cities it is otherwise; we have much to do to beautify them; they also were probably beautiful in an earlier stage of their existence; the march of civilisation and of "street improvements," carried out on purely commercial lines, has spoiled them. And one of the worst things about our large towns is the manner in which dirt or litter are left about in the streets, with no systematic effort at cleansing them. In this respect London is as bad as any—perhaps worse than most. The following remarks by the American writer are worth studying by our County Councils:—

> "First in order in activities of this kind comes cleanliness. Clean streets and public places, clean private premises—with these secured, the first great transformation in the community takes place. When nuisance-breeding rubbish-heaps are cleared away, and vacant lots covered with all sorts of litter are cleaned up, everybody notes the improvement and is interested in seeing it maintained. Orderliness, of course, goes hand in hand with cleanliness. The latter cannot be secured without good order. And with good order there is an aspect of neatness that commands popular respect. It pleases the public eye. Nearly everybody will desist from throwing rubbish into a well-kept place, and from scattering torn up paper or other litter in a clean street. Public sentiment is easily cultivated in favour of public cleanliness and order. . . . . Good streets and sidewalks, clean and smooth, are among the best tokens of advanced civilisation. Cleanliness means health, and smoothness means the economy of energy — human, animal and mechanical—which is equivalent to economy of money. Every little unevenness of surface presents a corresponding push against energy expended, amounting to enormous aggregates of wasted force in the course of a day. For instance, there is probably less fatigue from walking three miles over a smooth sidewalk, say of artificial stone, than from one mile over an uneven walk of stone or brick. The final aim is the achievement of beauty. To this cleanliness and order lead. Without them there can be no real civic beauty. They stand at the base of it, and give the good surfaces and true lines from which beauty is developed."

It is interesting also to learn that half a century ago a special move in the direction of beautifying was made by a small town in Massachusetts, Stockbridge by name, at the instance of a lady—Miss Hopkins, afterwards Mrs. Goodrich—who organised a society for promoting the beautifying of the town. The example of Stockbridge was followed in other villages in the State; and moreover, it was found that it was a paying policy—"every dollar expended for beauty brought thousands back": surely a lesson worth recording and remembering. The frontispiece to the number is a fine translation of a portrait by Velasquez into wood-engraving, by Mr. Timothy Cole, whose engravings from the old masters we have so often noticed.

From a short article in *Scribner* under the heading "The Point of View" we learn that in America, as to some extent in this country, the question of the evil of preventible noises in cities is in course of being considered and taken up seriously. Under the heading "The Field of Art" are "Some Notes on Pattern-Making—by a Bookbinder," which are sound and true in spirit, but contain nothing that has not been said before. We quite agree with the writer in deprecating the rather increasing tendency to decorate bookbindings with realistic foliage or other representations, in place of conventionalised ornament designed for the space which it is to fill.

Harper contains an article by Dr. Morris Jastrow on the recent work of the German explorers on the supposed site of Babylon. The article is entitled "The Palace and Temple of Nebuchadnezzar," and gives plans of the site and excavations, together with a fine chromolithograph of one of the figures of lions in bas-relief in coloured tiles which has been restored from the fragments found and put together. The lion figures apparently formed two rows of coloured sculpture on each side of a processional road, with a rosette frieze above them. Mr. Bertelle M. Lyttle contributes an article on "Recreations in Cartography," a study of the beginning of map-making, with reproductions of some very curious maps of early date—early, that is, in the history of map-making. The knowledge of the true outlines of land on the globe is, comparatively speaking, of very recent date. An Anglo-Saxon map of the world, of the tenth century, is an odd compound of a little basis of fact and a great deal of imagination. The relative positions of Great Britain and Ireland, for instance, are given with approximate correctness, but England and Scotland are joined at a right angle, the latter extending round the south of Ireland. There is a crude representation of the position of France and Spain, and of the Mediterranean and its archipelago, which come nearer the truth than one might have expected for that date.

The *Pall Mall Magazine* contains an article on the now constantly recurring subject of the Panama Canal, of which the most valuable item is a section of the route, shaded to represent what has been cut by De Lesseps' Company, what by the present Panama Company, and what remains to be done. The article, by Mr. J. Geo. Leigh, is a historic, not an engineering one. Mr. Douglas Freshfield contributes an account of "A Holiday Tour in the Himalayas," with some fine illustrations from photographs.

In the *Engineering Magazine* we again come across the Isthmian Canal scheme, treated by the same writer as in the *Pall Mall Magazine*, Mr. J. G. Leigh, with the same conclusions and some of the same illustrations. A wise and thoughtful article by Mr. Percy Longmuir, on "The Possibilities of a New Trades Unionism," has for its main object to suggest that trades-unions should go beyond the mere question of fighting for least work and highest wages (that is our summary of the situation, not the writer's), and make it part of the business to assist the general education of the workman, and his interest in his work. Mr. Longmuir adds:—

> "Should any units of this mass show by special talent, aptitude, or inclination, a fitness to enter the lower branches of skilled industry and so work upwards, then give them every chance to do so, and not, as is now the case, close every avenue of approach save one and crush every spark of ambition in men who may unfortunately have had no early chances."

In *Feilden's Magazine* the subject of the Isthmian Canal again appears, and again by the same author, Mr. Leigh. We wonder how the editors of the three magazines to which he has contributed practically the same article appreciate this system of duplicate, or in this case triplicate, contribution.

In the *Essex Review* appears Part IV. of Mr. Glenny's historical essay on "The Dykes of the Thames." We hope this will ultimately appear as a separate book; the subject of much interest, and is very well treated by the author.

In the *Antiquary* Mr. T. Sheppard's "Notes on the Antiquities of Brough, East Yorkshire," are continued. Mr. Sheppard supports the view that Brough is the site of Ptolemy's

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"Petuaria"; for his reasons we must refer the reader to the article. Mr. J. Russell Larkby gives two sketches from Catherington Church, Hants; one of a wall-painting of "St. Michael Weighing Souls," the other of a much weathered Norman Calvary which has been set up against an angle of the church; a most unsuitable position as we quite agree; it should have been set up as a separate object standing free, as it no doubt originally did. The first of "Notes of the Month" records a very interesting discovery of vestiges of lake dwellings in a field at Colemere, near Ellesmere, Shropshire, on a site which is still very marshy.

The recent interest in aërial navigation is marked by the appearance of a new quarterly magazine devoted to the subject, under the title *Flying*, of which the second issue has been sent to us. It contains full information in regard to the most noteworthy recent experiments, that of M. Santos-Dumont and other aëronauts, with numerous illustrations.

The most interesting feature in *Knowledge* is a fine illustration of the telescopic appearance of the planet Mars, to which so much attention has been drawn lately; it accompanies an article by Mr. Antoniadi on "Recent Observations of Mars," with a number of other illustrations of the face of the planet as observed at different times. Mr. W. Maunder continues his essay on astronomy without a telescope, treating this month of "The March of the Planets."

The *Gentleman's Magazine* includes an article on "Bells," literary rather than scientific, but not uninteresting.

HOUSE BUILDING.*

VIOLLET-LE-DUC, in "l'Habitation Humaine," traces the art of house building from its earliest beginnings. He draws a picture of the primeval inhabitants of the earth crouching for shelter beneath the overhanging branches of friendly trees, and shows the first stirrings of the building instinct. He very truly emphasises the fact that the practical requirements of warmth and shelter first awakened this instinct.

But man is not the creature of a single idea—joined with this purely practical art of shelter making is a mysterious and undefinable desire to make things beautiful. Leaving behind these misty ages, and passing on to the times of which we have recorded history, we still find this dual sense at work; men, putting up buildings exactly to their requirements, and full of an inimitable beauty; buildings which now, after the lapse of centuries, awaken in us the most profound admiration. We find this beauty and fitness, not only in the large and monumental buildings, but in humble structures, and household furniture and utensils. The art of house building developed slowly, but it was always a natural development, exactly supplying the wants of the people. In the time when life and property were insecure, people housed themselves in such a way as to be safe from attack. Then when a less rude age succeeded, and a more reposeful life became possible, the austerities of the castle disappeared. Home life and all that it implies was expressed, but always, men built their houses just as they wanted them, in a natural, straight-forward, every-day way.

Let us now come to our own times, the great "age of progress," and what has become of the art of house building? English people are accustomed to boast that the love of home is peculiarly English. Nowadays it is, indeed, difficult to sympathise with this sentiment, for anything more unlovable than the average English house it is impossible to imagine. I would rather not believe that people really take a pleasure and delight in anything so unworthy, but I fear the evidence is too strong to be at all in doubt about it. In spite of education, in spite of everything that should make for it, a natural healthy taste is not to-day a national possession. Some evil spirit is abroad which "makes us to have a wrong judgment in all things;" our ordinary homes and all that they contain are, I believe, more tasteless and unmeaning at the present day than ever before. Things of simple form suitable to their uses have been discarded for formless abominations, further disfigured by machine stamped "ornament;" and it is no exaggeration to say that in thousands of houses there is nothing worth its making, from cellar to garret.

The reason for all this is not far to seek. Modern conditions of labour have made a national art impossible. This is not, perhaps, the place to speak at any length on the organisation of labour, or the master and man system of to-day—it is difficult to avoid it altogether, as the decay of the builder's art is really the outcome of this system. We may, however, I think, take it for granted that a natural architecture growing out of the actual work of a community is dead; but we are always told that out of death comes life, and architecture in dying has brought forth the architect, and made him the heir to some at least of her secrets. We may pine for the days when architecture was a living art, but it is no good to wring our hands and sigh our lives away. It is better for us as architects to define clearly in our minds how we are going to use our small inheritance. It is anyhow easier to do this than to remake the world!

We may, for the sake of argument, divide modern architects into two classes. Those who look for a development of an intellectual architecture—an art based on style learning—and those who argue that as all *living* architecture has grown out of actual building, the nearer they can approach similar conditions the better is the chance for a natural and legitimate expansion of the art.

The "Intellectuals" present a strong case. They may state it somewhat as follows:—Architecture has grown through generations with the growth of the people, and has now crystallised into a definite and expressive language. This language can be learned, and architectural compositions can be produced of more or less beauty according to the scholarship and skill of the architect. This seems a very reasonable theory, and certainly fits in with the conditions of modern times; but has it borne good fruit in practice? It has now held the field for many years, and are we, do you think, any nearer to the promised land? Don't we find that, so far from this language of architecture being learnable, it is a very Babel of Confusion, a language which changes its form and grammar every decade almost? Greek, Roman; Gothic of all periods, one after the other, and at the present day a jumble of everything!

The case for the other side is not so easy to state. Let me put it as clearly as I can. Granted that architecture has grown out of the actual processes of building carried on under natural conditions, that the styles, as we call them, represent the high water mark of the builder's art at each period, and that just as these conditions changed, and skilled labour was forced into unnatural grooves, architecture declined; therefore it is but reasonable to infer that it can only live again on the same terms. Let me quote here part of a lecture delivered by William Morris to the students of the Birmingham School of Art in 1894. Referring to the beautiful English villages, now fast being destroyed, he says:—

> "Keep your village houses weather-tight, trim, and useful, and, where you *must*, build others beside them; but why, when you build these, should you make them specimens of the worst buildings in the worst suburbs of a modern town? Even in the passing day, if you build them solidly and unpretentiously—using good materials natural to their country side—and if you do not stint the tenant of due elbow-room and garden, it is little likely that you will have done any offence to the beauty of the countryside or of older houses in it. Indeed, I have a hope that it will be from such necessary, unpretentious buildings that the new and genuine architecture will spring, rather than from our experiments in conscious style more or less ambitious."

And further:—

> "Now this matter of the proper understanding of architecture is at the present moment of such overwhelming importance in the consideration of the future of the arts that I must say a few more words about it, even though it be in parenthesis. I mean in plain terms that the manner in which our buildings, and especially our houses, are built is really the foundation of the whole question of art; and that, if we cannot build fit and beautiful (not necessarily highly decorated) houses, we cannot have art at all in our days."

These are weighty words, both inspiring and depressing. If any man may speak with authority, surely Morris may. In the making of all sorts of fabrics and wall papers, "Architecture in little," as he may have called it, he actually invented the "new style," which has been vainly demanded of architects for many generations. And how did he do it? Emphatically not by learning an old style and composing in that acquired language, but by going to the root of the matter and learning how to make things with his own hands. He recognised the very simple truth that everything grows and expands from its *roots*. Is it unreasonable, therefore, to suppose that architecture must follow this universal law?

I have put before you two views. First, the development from style learning; and secondly, the development from actual building. The first has been tried with varying success, but without so far any very definite results; and although much interesting work has been done on these lines by men of really great talent and endowments, I think you will agree with me that we are as far off as ever from anything like a national expression in architecture. The second view is sound in theory, but unfortunately the machinery is wanting to put it in practice. For us architects to throw away our T squares and take to the chisel and the trowel would be useless. What little influence and what little power we may have to mould modern architecture would be lost, and the gain would be nil; we should simply be a handful of third-rate bricklayers and masons, with a very poor chance of a "job" even with a speculating builder. The words of William Morris indicate a middle course.

I have called the modern architect the heir to some of architecture's secrets. I mean by this, that so far as that is possible, he is the representative of the old builders; that born in him is the instinct to build, and that he should develop this instinct, and turn his mind to architecture as the art of beautiful building.

These definitions leave me with an uncomfortable feeling that I have been at great pains to explain the difference between Tweedledum and Tweedledee, and that, after all, the result will be much the same whether we study and practice architecture as style composition or as building. That is possibly true up to a certain point. The visible difference may not be great, but nevertheless I believe that if we accept this view, and try to develop architecture on the lines I have indicated, we are on firm ground; and that if we take our materials, see where they lead us, and what we can do with them, and let them help us to make our house-building rational and beautiful, there is here at any rate the germ of growth, and we shall make something more of our art than by pursuing the language of style method. Anyhow, I am content to advocate that view. I feel that we should do all that we can to master the science of building and know the possibilities and the proper uses and limitations of materials, and if we use these wisely and properly, with such quiet good taste as we possess, and plan our house sensibly—not shirking any one of the practical building problems that confront us, but making of them opportunities for the exercise of our skill, and what we have of the instinct for beauty—we shall, I believe, achieve the best results which are possible for us at the present day.

Let us now analyse one or two old buildings and see how much we can get out of them, and how far the builders' recognition of the exigencies of climate and material have given them their special shape and character. A Yorkshire house suggests itself as the first subject for our analysis. We find it built of stone, that being the material nearest to hand. The stone is used in good blocks, of such a size as to be handled without undue difficulty. (I have seen, by the by, many modern houses in Yorkshire where the stone is chopped into little courses and made to look like bricks.) A rigorous winter demands a stout wall and the builders provide it. Slabs of stone—the natural material again—form the roof. Hips and valleys are difficult to manage, and so we find that nearly always a simple unbroken span covers the whole building; the pitch not too steep or the heavy slabs would fall; eaves only slightly projecting (a great projection would overtax the unsupported rafter feet), and there we have the typical house, so far at least as we need analyse it to show my meaning. Where bricks and tiles were the available materials their use similarly influenced the shape and character of the houses. Hips and valleys present no difficulties; and gables and irregularities of plan were freely used. Clay, chalk, wood, lath and plaster, all are pressed into the service in default of other material and all take

* A paper read before the Leeds and Yorkshire Architectural Society on Thursday, March 13, by Mr. Ernest Newton.

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the shape proper to their uses. When thatch of reeds or straw formed the roofs, the old builder unerringly grasped its capabilities and with admirable ingenuity covered his building. We could go on indefinitely, but I have I hope said enough to indicate the lines on which we might go in making houses ourselves.

Having then decided in our own minds that we will approach house building on these lines, how shall we set about it? First, I would say, let our houses be English, and let them, moreover, be local. As the characteristics of all houses, in all times, have largely been determined by climate, by the usable local materials, and the practical requirements of those who were to live in them, let ours be determined by the same factors. Here, at the outset, I admit we are met with a difficulty. Few people now have any requirements at all except cupboards, which seem to be the one clearly-defined desire of the English housewife. The man may want a "den," and out of the den and the cupboards the architect has to make his house. Fortunately, there are certain "constants" in house building, all commonplace and ordinary, but of sufficient importance to shape our home. We must in England have solidity, sunlight, and a roof that will throw off snow and rain. Here are the ingredients for a good house. Now, let us plan it in a simple, straightforward manner. Do not let us annex the features of old houses wholesale (features which perhaps grew out of a building problem proper to that house only), but let us make our own "features" out of our own requirements and difficulties, always remembering that there is an art of "leaving out" as well as of putting in. We ought not, either, purposely to make our houses look like old ones.

I do not want to be misunderstood here and to appear to advocate starting from nothing—we have seen in what, I believe, is called the "new art" where this may lead us! We are heirs to certain possessions, and until and unless circumstances should require the invention of new forms we shall rightly and properly use old ones; in fact we *must* whether we want to or not, but let us know what we are using and why we are using it, and rigorously exclude anything that we do not want, or do not understand.

Just a word on sculpture and painting. Our houses ought to be further adorned by painting and carvings, but, unfortunately, painters and sculptors devote themselves almost exclusively to easel pictures and portrait busts. They are also very exalted people, and would not, I fear, consent to add to the beauty of our ideal house, unless it were one of some magnitude with a reward in proportion. We are better without any, than with cheap makeshifts which do not adorn, but merely irritate.

You will think that this building architecture, based on the constructive and proper use of materials, does not foreshadow any very great or brilliant achievement—well, perhaps these are not the days of great and brilliant expression in architecture; but I believe that if we tackle the problem on the lines I have sketched, we may not, perhaps, build houses worth a pilgrimage to see, but we shall, at any rate, build them so that they will fit in with their surroundings modestly and quietly, instead of proclaiming to all who pass by that although they may bristle with "correctness," and vibrate with "hall-marked" detail, they mean nothing, express nothing, and are merely good building material misapplied.

I have noticed in all papers which deal in any way with modern architecture that it is considered right to devote a part to what are called "practical points." I now therefore follow traditional precedent. Of what I have called the building "constants," the roof is on the whole the most important. It is not difficult to plan a house that is solid, convenient, and well lighted, but which cannot be covered without flats and snippets of roof. It is, therefore, not a good plan. The proper covering-in of buildings has exercised the minds of builders from the earliest times, and the skill with which this has been accomplished has been the measure of their achievements. Then, as to windows, while we must have enough sunlight we must not have too much. Time and use have sanctioned windows of almost any proportion—height greater than width, or width greater than height; but in the subdivisions we find each separate light higher than it is wide. There are many practical reasons for this. Lintels require support at frequent intervals; casements or sashes are more easily hung and worked when their height is more than their width. Other reasons may occur to you, but I think we may take the main facts as settled, and not trouble to work out the whole thing "from the egg" again. The high-shouldered transome is quite a modern invention. In old windows it was very little above the middle line, and so strengthened and tied the mullions just where the strength and tie were wanted. The position of the windows is naturally most important, but no rule can be laid down for this. Speaking generally, we may say that if the house is well planned, and the windows put in the best positions in each room, they will be right and will look right. Again, the type of window will very much determine the character of the house.

Let us suppose that we are going to build our house in a very sunny position, and would like to be able to temper the sunshine with shutters fixed outside—obviously, if we want to open the windows when the shutters are closed we must have either casements opening into the room, or sashes. The sunny aspect is also the rainy aspect, and as it is difficult to keep such casements weather-tight, we decide to use sashes, and we shall find that our choice of window will determine, to some extent, the proportion and character of our house inside and out.

Then the projections of parts. Do not let them be too small or they will look glued on. One sees sometimes a gable on a house front that has been contrived by a projection of about a foot. Rather than do this, if you must have the gable, have it without the projection. I would say, also, avoid unnecessary buttresses at the angles of the building. These have crept into our house building lately; they are not wanted, and, instead of adding to the apparent strength of the house, they look like struts put up in haste to prevent it from tumbling down.

We must by no means neglect the colour and texture of our materials; if we use stone, let it be good weathering material, bedded according to its depths in the quarry. The walling plays a very important part, and must be considered practically and built naturally. If we use bricks and tiles, let us take care that they are pleasant in colour and surface. The manufacturer's ideal brick, like cast iron in texture, and of an anæmic and unpleasant colour, and a vitrified and volcanic looking tile, are practically impossible. I doubt if an archangel could successfully wrestle with them, but if they are the only bricks and tiles we can get without importing, we must do the best we can with them. It would be quite allowable to whitewash the bricks. Thin blue slates are even more difficult to deal with. They are, at any rate, only possible architecturally in their own district, and it is a waste of good effort to import them. Half timber work should only be used where it is the sole possible method of building in a locality; and then genuinely accepting all its difficulties and drawbacks; used as a sham piece of make-believe picturesqueness it is quite indefensible.

Our rooms may be any height, but if they are long and narrow, they should not be too high; arbitrarily to lay down a rule that *all* rooms must be high, or all low, is, of course, absurd.

Professor Kerr, in his "English Gentleman's House," gives some excellent hints on the placing of doors, windows, and fireplaces—small details not to be despised. The perfect house is to be perfect all through, and is to be comfortable to live in, as well as comely to look upon.

I am afraid you will think that what I have said is all very commonplace and tame, that I have really said but little about the art of house building, and nothing at all about grouping, proportion, and light and shade. I must confess that I find the latter too elusive for analysis, and I have tried to evade the difficulty by picturing man as possessed of two building instincts, the practical and the æsthetic; and these, working as one, leading him to produce architecture—and there I must leave it. As to the rest of my short paper, I can only say that I have done my best to grapple with a subject of some difficulty. Architecture is in a transition stage. The style theory somewhat discredited, the natural channel of development through actual building denied to us, we have to find some rational method of architectural expression, and this I have tried to indicate; what the future holds I would not venture to predict, but for the present I would say, let us build honestly, soundly, and sensibly, with a definite intention to make our houses as beautiful and expressive, in every sense of the word, as we can, and we shall have done all that we are now able to do, and may with a quiet conscience leave the future in other hands.

MODERN TREATMENT OF STREET ARCHITECTURE.*

A WHOLE-HEARTED acceptance of the doctrine of a frank modernism of design and construction in business premises by architects, is sufficient requirement to make of them for the establishment and growth in our midst of a healthy street architecture, which, expressing the movement of the age in its requirements, will reflect the intellectual attitude of trained and artistic minds applied to a commercial problem in building. The profitless and stupid antipathy that is supposed, and partially exists, between commercial and artistic character, should thus, at all events in architecture, cease to be confessed, and having reformed the attitude of art to business life we can the more sincerely and successfully hope for and attempt the resuscitation, for it once existed in pure and noble beauty, of living art in the commercial world.

The employment of modern materials, and the joyful acceptance of current requirements as a means of expressing a progressive architecture, will, however, bring the architect into conflict with other ideals than those merely of an archæological correctness or antique style. Serious problems in design, nearly all as yet practically unsolved, await him when the first and upper floors have to be designed over and upon a lofty ground floor shop, the front part of which occupies all the clear space between the ends of the bounding party walls on each side.

It may be taken as a canon of architecture that buildings must not only be of a construction that is secure in itself, but must be obviously so, and that a building, however scientifically safe, will not be architecturally satisfactory to the eye and mind unless it also appears to be safe. Doubtless time is a great convincer in matters of artistic criticism, and if a sufficient number of examples of a novel method of construction were put before the world to manifest to it that what is apparently unsafe, perhaps hung upon nothing, is after all perfectly secure, and scientific as well, after a time this canon of architectural criticism would be satisfied in spite of itself by the relation of experience to judgment, and the disappearance of that distrust of novelty which is a gift of Providence to save men from calamitous experiment.

We should have become accustomed, perhaps, by this time to seeing great and massive erections of weighty stone and brickwork poised upon the slender brass pillarettes, lace-like arches, plate-glass fittings, and mahogany fascias of shop fronts; but we are, I am sure, suffering artistic discomfort, and deriving no pleasure from their carved and ornamental blandishments, owing to the initial hiatus that the system of architectural design employed demands a basement and obvious foundation, and has none. With this difficulty the modern architect wrestles ineffectually; the implements of his trade were all made for buildings with bases, and he knows not how with them to fashion a modern design without obvious support. The difficulty is everywhere self-confessed, and causes an infinity of interesting and sometimes amusing expedients. The projection of the shop front beyond the general face of the upper stories of the front, thrown out so to speak as a screen beyond it, is a device only very partially successful; it has a certain sufficiency when the shutters are down, but modern progress is depriving the shop architect of this scrappy resource for architectural effect at close times, and on Bank and half-holidays. The void is there, gaping all the week, with perhaps the flimsiest draperies depending from the ceiling within it, dispelling all illusion as to supporting a very mine of weight overhead. The emphasising of the end piers which mask the party wall ends, and the development of a cornice with the shop fascia to connect them and form a horizontal bridge, on which the upper part is carried, is frequent. This should be a more satisfactory method, as it would disregard the shop front

* Part of a paper read before the Applied Art Section of the Society of Arts, by Professor Pite, on Tuesday, the 8th inst.

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and its contents, and dissociate the composition of the upper stories from the lower ones. The failure, however, occurs in that the establishment by this treatment of a factor of architectural proportion integral to the whole front has as yet failed to obtain recognition. The architect supposes that the business has been completed, and proceeds in designing the floors immediately over to dispose his proportions in the traditional way employing lintels and openings of ordinary narrowness, each of which is unconsciously engaged in defying the exaggerated yawn of the cavern below spanned by a member of their own architectural family under abnormal conditions. It may be more easy to point out than to demonstrate that the system of proportion compelled by the ground story should be recognised in the design of the upper ones, and though openings above are not required of the extent of that below, there is a logical symmetry of spacing which would take the first factor, and by progressive reduction or systematic subdivision apply the scale and diminish the proportions harmoniously with satisfactory results.

We have referred to the usual treatment of the shop or ground-floor story by supporting pilasters and a carrying cornice with a reversion to ordinary proportions in the upper part, but the treatment of the story over the shop front as a mezzanine or *entresol*, and as part of the shop front, must not be omitted. A few years ago it was more commonly used as an architectural device for getting over the difficulty of affording apparent support to the upper part than it has been of late years—the latter developments of shop design having a tendency to make two stories of shop fronts extending over an area of plate-glass unbroken by constructive lines, over nearly half the elevation of the building. The mezzanine proper was enclosed by an arch springing from the side pilasters at the level of the head of the shop front, and spanning the whole frontage, if one of ordinary narrowness, rising to the underside of the floor over the mezzanine; thus an arch is gained of considerable size, and at first sight of some capacity, not only for carrying the upper stories, but of blending the smaller scale of that part gradually and harmoniously with the ground floor.

For single house and shop fronts this method has not proved very successful. It can be easily imagined, and indeed seen in many examples readily called to mind, that a large arch springing from narrow pilasters on the extreme limits of a frontage gives the impression that its thrust must be acting upon the neighbouring buildings—in the most likely cases also shops, and appearing to crush them. The initiated will, of course, understand that this will not actually happen, as the arch is more apparent than real, the weight of the upper building upon it being probably carried on a concealed horizontal girder behind the crown of the arch. The success of the arched mezzanine treatment therefore depends largely upon its neighbouring abutments, and unless these are controlled by the same designer or pre-exist in a satistory way, the experiment is very risky. Instances can be cited in very modern London of lofty and powerfully-drawn arches of brick and stonework carrying with apparent scientific and architectural balance a series of upper stories, but conveying their weight by every optical demonstration of mechanical law against the plate-glass expansion of a neighbouring elevation of the picture-frame order.

The *entresol* arch is also dependent for complete effect upon a sufficient reveal or exposed thickness on its under sides to convey the impression of the substance and strength requisite to ordinary walling materials. This becomes difficult, if not impossible, where the shop front is continued upwards into the mezzanine, but can be obtained by recessing the window of the mezzanine upon the shop fascia.

The arched mezzanine treatment is most satisfactory, if not only so with any certainty, when several fronts can be treated alike, and a continuous effect, as of an arcade, obtained, the arches over each shop corresponding and providing the effect of mutual resistance to thrust which is required. In such cases there is no reason why the arched construction should not suffice for carrying the wall above, provided that the easement of support required from the neighbouring houses is secured by the mutual covenants which originate in a joint ownership of such rights. The north side of New Oxford-street, towards its western end, affords a successful and satisfactory example of this treatment, the general proportions of the whole block and the reduced window requirements of the upper stories being harmonised with large openings of the ground and mezzanine stories by the architectural treatment of the arcade. Though this example may be open to other criticisms as to internal arrangement, it presents a standard to which, unfortunately, there has been no approach in any more recent example of an extended façade of shop fronts. The architect should be urged to continue to make use of the story over the ground floor as a mezzanine on account of its value in extending the carrying proportions of the shop front, and of combining them with the complementary stories of the building into a homogenous and expressive design.

In general, architectural proportion is so much a matter of the relation of the solids to voids, that the designer of a shop-fronted house, limited as he is by earlier considerations, has very few principles left to guide him. The relationship of voids to solids cannot apply to this class of design, because the solids have to be eliminated as a condition precedent to suitability for shop display. The architecture becomes a collocation of window frames, and the solids of which these frames are apparently constructed are unreal, concessions to architectural fancy, as in most cases the stone piers and window heads are but casings to metal girders and stanchions, large and small alike. Deprived of grouping, confined in perspective, tied to a topsy-turveydom of design, the architect of a shop front has difficulties to contend with which one devoutly hopes that he is alive to. But it is to be feared, that the instructions of his commercial employer, that his new front must be exactly like a superior rival's, or must be like the Louvre in Paris, or, like a Scotch castle, have steeled his artistic soul, and he reflects that it is hopeless and profitless to struggle with a client who has no taste, and that after all he is not paid by him for any other purpose than to provide him with just what he knows he wants.

We have not mentioned other artistic terrors, as figure or name tablets, signs, and electric startlers, in many cases necessary to commercial existence, though rendered so only by the force of a bad habit, which could be readily and painlessly cured by statutory enactment. It may be suggested to the commercial world that the "best" shops, and streets of shops in London, are those where this obnoxious habit of self-assertive emptiness is less apparent than elsewhere, and that reputation and success are assumed by the public to belong to that house of business that dispenses with—to put it mildly—inartistic advertisement. However, as part of that frank modernism which we have predicated for the commercial architect, the provision of significant spaces for inscriptions, and of such signs, as architecture can, by deliberate forethought and pre-arrangement, make properly conspicuous and artistic at once, is a certain part of his problem, and a by no means unpleasant one. Inscriptions and signs add a literary value to buildings which grows in value with every year of their history, and we could foresee a pleasant development of particular symbols and types in commercial architecture expressive of and akin to purpose in the building of use alike to the tradesman and of interest to the public and artist.

The architectural qualities which can be exhibited in street architecture are thus comparatively limited. In the greater number of cases the front or façade only can be seen and is capable of considered design, though in corner buildings there is a return frontage available which admits of some grouping. The fronts of the many buildings forming a street are each comparatively narrow and lofty, and, unless the street is a wide one, the general effect of the design can only be appreciated from the limited standpoint of the pavement, either in sharp approaching perspective or in a directly opposite view from a point near to and under the building. These limitations very seriously affect the possibilities of successful results, it being borne in mind that the success of the architecture is that of the executed building *in situ*, and not of the harmony of the proportions in true elevation or upon its picturesqueness in an ideal perspective view. The test of satisfactory result rather than of pleasing elevation must be applied rigorously to his work by the architect. This is not an easy thing to do, as each projection and horizontal effect is accentuated, while vertical lines and proportions are all foreshortened from either of the possible perspectives of an ordinary street. London architecture has but few examples of suitable methods of dealing with this difficulty. The horizontal cornice upon the skyline and similar lines subdividing the front above and below each story of windows are the more usual methods. These have become simple to the designer solely from custom and from the facility with which they are drawn with a T-square, but a free consideration of the problem of designing narrow frontages to lofty buildings in a narrow street, would certainly suggest that horizontal lines, with no continuity beyond the limits of a small site are, possibly, not the only means with which to attempt suitable design. The varying contours of streets, sometimes broken, curved, and crooked, sometimes in long straight lines, would direct some treatment which would not necessarily—as continuous horizontal lines must—throw each separate frontage into violent contact with the proportions of its neighbour.

There grew up in Gothic times, in the narrow, devious lanes of busy mediæval towns, a method quite as universal as the use of horizontal cornices and lines, in the use of vertical ones, the grouping and arrangement being upwards, each window in a story being grouped over the one below it, the margin lines being made continuous, and carried up into a gable in which the centre one often reached to the top, creating stories in the roof as it went up. The principle seems more natural and proper, and one can easily imagine its growth among the craftsmen as a necessary tradition of street building, and vindicating itself by its suitability and truth of expression to their artistic instinct. It may be remarked that, in other branches of building, all of the same period, such as in the external design of churches, detached houses, and castles, there is no such universal tendency of vertical expression, the use of ornamental and corbelled parapets, tending to complete many aspects of these buildings horizontally. But in street architecture the vertical grouping is very general, and instances of any other principle would be difficult to find and group, until the dawn of the Renaissance, which brought with it the cult of the enormous horizontal crowth or cornice.

Many examples remain in the low countries and in north and western Germany, as at Lübeck, Münster in Westphalia, and Nuremberg, of the assiduous application of the vertical principle to narrow street fronts, executed in brick and stone, and collectively a more instructive exhibition of the innumerable possible combinations of simple forms upon one method is obtained. Of similar wooden architecture, where the horizontal principle of beam or lintel construction necessarily enters all the construction and design, England furnishes examples in cities, such as Chester, Shrewsbury, and Tewkesbury, while in Normandy there are many refined examples of beautiful half-timber fronts. The application of a delicate artistic originality emphasising and giving value to vertical expression can be observed in mediæval examples, and the employment of horizontal steps in the brickwork gables, so characteristic to us of Bruges, is echoed in stonework examples in Westphalia, while the Scotch corbie-stanes or crows' feet all subserve the same vertical principle of design. The advent of the Renaissance in Northern Europe did not, as in the South, bring the pedantic use of huge shadow-casting cornices into its less sunny clime that was left for the pseudo Italian palaces which made the modern London of fifty years ago so gloomy, but allowed a great freedom of treatment in line and ornament, gradually casting loose from the craftsmen's methods of development from purpose, fitting and subduing all to preconceived notions of architectural effect. Swirling curves and disjointed architectural fixtures soon began to exercise themselves upon the polygon of wall surface provided by the front with its gable, and it was not until the need of a new restraint began to make itself felt that the freedom of rococo treatment was reduced by a steady application of horizontal cornice lines over and under each story of the façade.

The happy independence which was obtained by each front, when the vertical method of design was practically universal, procured in the aggregate of a street view a charming grouping and freedom which has a fascinating

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effect, and always proves attractive to the artist follower of Prout and Roberts on his sketching tours. The more or less flexible curve of the lines of road and gutters in a winding narrow street combine and yet contrast with the closely grouped vertical subdivisions of the house fronts, often broken by occasional projecting oriels or corbelled turrets, or in half-timber work by joist ends and brackets, and with the gable peaks in varying proportions, heights, and skyline, pictures naturally form themselves without effort of fancy or composition. The charm of a mediæval town has certainly within it a basis of reasonable beauty instructive to us as modern street builders which will bear stripping of its antiquity and associations, that is of the quality with which we cannot endue our designs, and compare instructively with the artistic effect of more modern thoroughfares, whether purposely architectural—as in the chill sobriety of Moorgate or King William-streets—or accidentally arranged on modern lines—as in Queen Victoria-street or Shaftesbury-avenue.

We do wish to assure an universal artistic principle of street building design, for to do so would be to limit the illimitable possibilities of artistic combination and effect, but from the impressions of result we may derive safely enough the conclusion that in narrow frontages the design should be self-contained, its lines terminating satisfactorily within their own field, and the direction which is to the eye unbounded, namely, the vertical one, being that in which the artistic sense of appropriateness can be best brought to play. While totally, the effect of a street or city built of independent but self-contained designs, is pleasing, the separate fronts adding together picturesquely in the necessarily horizonal perspective of the streets.

There are, however, many principles of design and ideas of symmetrical or picturesque arrangement besides those into the discussion of which we have gone at some length.

The principal consideration, in contrast to what we will call the mediæval independence of each frontage, is that of an uniformity compulsorily applied either by that relic of mediævalism, most necessary and useful to architectural effect, the lord of the manor, or by special legislation. The underlying idea in such cases is the assumption, almost an unproved one, certainly uncertain, that uniformity of effect in street architecture is necessary and desirable in the interests of dignity and art. This whole doctrine of architectural symmetry has been courageously assailed by Gothic revival enthusiasts, its value denied, and its effects of repetition and gradation scouted, as formal weaknesses alien to the picturesque and truly artistic. The present generation stands in many respects at the parting of the ways. The heat of Gothic vigour has evaporated, and we are prepared to consider its artistic assertions at least as coolly as we have regarded the orders and proprieties of the preceding school which produced Regent-street and park.

Within the last half century public taste, national genius, or what you will to call that will o' the wisp, has romanticised into mediævalism with its guilds and crafts, ideally uniting work with art in life, and not in vain; also not in vain has it discovered the charms of the Bloomsbury and Soho view of art life, with its sober respectability of external appearance, and delicious completeness within, reticient to plainness about the house and home, and serenely Athenian in monumental churches and porticoed institutions. While this sprite of fashion is at present dissipating her enthusiasms in a somewhat libertine interlude, we can do no harm by putting in a plea for the organised hypocrisy of Regent-street, with its many and various dispositions and subdivisions successfully masked in stately groups and blocks culminating in the magnificent quadrant, new made annually with fresh paint which renews every architectural feature with whiteness of surface — and is not architecture mainly surface matter after all! The sense of scale, of grouping, of harmony, and of successful regulation, still survive in Regent-street, though well nigh three-quarters of a century have elapsed since it was designed, and of all London streets, it is yet the only one of which, as street architecture in total, we can in any way be proud. We must not fail, though, to qualify our self-congratulation by the objections which lie below the surface, for they will practically prevent an entire repetition of the experiment. The stately grouping of varying blocks has been achieved mainly by the sacrifice of what to-day would be altogether too valuable comfort in arrangement, and of market rental value in the "upper parts." There is a manifest wrestling between internal facts and external appearances, which struggles with windows, parapets, and roof lines. The pleasant proportion of width of street to height of building will be rarely attained now in any great city, and the charm of curved line on which the whole street scheme is planned from St. James's Park to Langham-place is uniquely happy in its architectural effect. The effort was a great one; the genius of Nash one for the occasion, and the result characteristic of the age that produced it, and serviceable and delightful to that which has followed. London would frankly approve of a repetition of the occasion, effort, and genius, and of a result as expressive of our generation as of that of the First Gentleman of Europe.

A practical aspect of our subject sorely presses us to-day in London, and to some extent in all our larger cities. We have been considering the improvement of our street architecture upon definitions of the requirements of commercial buildings, and the way in which the architect seriously devoted to the advancement of his art can meet and give them artistic expression. These requirements postulate as a requirer an intelligent progressive man of business as also a sympathetic and trained architectural mind to consider them. But practically neither the business man or the architect have anything to say upon the matter in a way which can affect street architecture, for their buildings are ready made for them. They are the production—and as such also express the characteristics and ideals of their producers—of building investors who, buying or securing the most prominent and serviceable sites, have erected speculative shops and warehouses upon them as ready-made goods for the purchaser. I do not propose to take any exception here to the speculative purchase of land likely to become valuable, or to its being offered at the highest obtainable figure, and though it is gravely open to doubt whether the policy of providing ready-made buildings is the best and most profitable either for the promoter or purchaser, or for both, I conceive it well to be within the proper limits of our subject to-night to protest in the name of our commercial men, in the name of architects, and of all passers-by who have regard for the pleasant, decent, and beautiful character of the cities of our land, against the outrageous vulgarity of design, ignorance, or defiance of elementary considerations of appropriateness, of proportion, and architectural suitability in expression, and against the abominably bad ornamentation that characterise the great speculative building blocks recently erected and now being carried out upon many of the most important sites in the metropolis. There seems to be no protection for the public, refined or unrefined, against the insults to taste and national self-respect by which the sordid incapacity of grossly ignorant men deface our finest and most important thoroughfares. The architecture of the whole class of speculative building is normally of a low class, but since this element has invaded the more expensive sites, and proceeded to erect buildings demanding the highest rents, the depths of the degradation of speculative building art have received new exploration and exposure that is appalling. Kind nature makes us slowly oblivious to constant or recurrent physical pain, but, speaking from painful experience, I cannot discover any such alleviation in the doom of having to come into daily contact with buildings in high places exhibiting the worst effects of architectural degradation. Indeed, a settled despair of London, in spite of much in many directions to give bright hopes of oases of cheer in the desert, drops with chilling and deadly effect upon that zeal without which an architect is fairly useless to his fellows and his art. A really bad building is a upas tree, to be destroyed as rapidly as possible; and of the real badness of this branch of modern street architecture no one has any doubt. It is not even to be expected that the promoter, or even architect (so-called) possibly knows, or cares, that it is bad or good. Their interests are otherwise entirely wrapt up in present profits, and these are compelled by the occupation by their buildings of certain positions, and ensured at no more or less, whether the architecture is a source of pleasure or pain to the citizens upon whom it is forced. We protest. If we can do nothing else, we will make this beginning by crying revolt against a shameless bad architecture, continued disgrace to our building art, commercial intelligence, national self-respect, and civilisation. There are no good points, not even of arrangement, and suitability or improvement, in the design of these blocks, and their construction sails as near inefficiency as the administration of a difficult statute by hard-worked and heavily handicapped district surveyors can allow.

In conclusion, it is not, perhaps, much good railing at a blot, however iniquitous, upon the surface of a city, but as the mischief is spreading rapidly, we would point out again that, while not limiting buying or selling, free trade if you will, in land of public or private importance, there is a definite call for such a censorship, as liberal as you like, but cultured and wide, that will prevent the intrusion of ready-made or purposeless buildings of hideous and incompetent architecture upon our public streets. With good will some reference to authority of designs in important streets of distinctive character should be readily obtained, not only as at present exists by statute upon construction, height, purpose, and accommodation, but upon the more widely-dispersed, though less concentrated evil, of bad design. There is as yet no sufficient standard of public taste to enable us to trust such censorship without fear of controversy in the hands of any mere officials, but with the organised societies for the promotion of the fine arts and architecture, and for the improvement of our cities, there should be no difficulty in obtaining sufficiently large committees of taste willing to proffer advice, criticism, and exercise veto without illiberality or narrowness. There may be danger in this suggestion, the censorship may prove either a stork or a log to the frogs, but there are greater dangers in the continuance of the existing state of things, for some of the best streets of London are already marred and appear to exhibit a gross decadence of public taste, which is really as untrue as any other artistic characteristic of such buildings.

The London County Council, happily, to some extent, seem alive to this danger in regard to the great thoroughfare which they have now in hand, and as they have proposed regulations for buildings upon the new crescent towards the Strand, and have held a tentative competition for uniform designs, that certainly marks a progression of ideas in the direction of proper control. But the subject is one of great difficulty and complexity; and unless the control is in the first place wisely directed in the true interests of successful architecture by highly competent hands, and in the second is so entirely firm by enactment and covenant that it cannot be broken away from, the experiment will not be successful. These two conditions are not unattainable, and Londoners hope for much, as they always do, in spite of much disappointment. Into the discussion of the great new street from Holborn to the Strand, so full of detail and interest, we cannot now enter if we would. The preliminary work is too far advanced for suggestions to be of much value to the authorities, but we can and do appeal to all who build in our streets, whether promoters, owners, men of commerce, of speculation, or of public purpose, to employers, builders, and architects alike, to consider how deeply important is the right use of every opportunity of permanent building to the whole city, and if character is written in stone, wood, or iron, that character should reveal devotion to the highest ideals.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday evening at No. 9, Conduit-street, W., Mr. W. Emerson (President) in the chair.

The Royal Gold Medallist.

The Chairman said they would remember that the Council nominated Mr. Bentley for the Gold Medal, but unfortunately Mr. Bentley died two days before the election took place. They had to apply to the King, and ask what his pleasure was on the subject, expressing the wish that his Majesty should see fit that the medal should be given to Mr. Bentley's family. The King, as they knew, did not think it would be a good precedent to give the medal to the family because Mr. Bentley did not live to receive it, and the Council therefore could not do as they

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wished. Consequently the matter of nominating some one else came before the Council that day, and he had the pleasure of telling them that the Council nominated Mr. T. E. Collcutt as the Gold Medallist for the year. It needed no words from him to tell them of the work Mr. Collcutt had done, or of his distinguished services in the interests of architecture, which had caused the Council to come to this unanimous decision. The election would come on in due course, when he had little doubt that they would duly give effect to the nomination of the Council.

Mr. Robert Langton Cole (London) and Mr. James Miller (Glasgow) were elected Fellows of the Institute, and the following gentlemen Associates :—Messrs. Alfred Ernest Biggs (Felixstowe), Walter Watkin Ellison (Erith), and T. Marshall Smith (London).

Inlay and Marquetry.

Mr. W. Aumonier then read the first of two papers devoted to the subject of "Inlay and Marquetry." Referring first to the beautiful specimens of work exhibited he said that most of them came from South Kensington, Mr. Purdon Clarke having placed practically the whole of the museum at his disposal. Mr. Clarke could not, however, lend anything out of the Jones collection as it would be against the terms of the will. He had, however, brought a drawing of one specimen in that collection which gave them the colouring of Louis XVI. work which he thought was very beautiful. Proceeding Mr. Aumonier referred first to the two methods of making inlaid wood. The one is to cut the design which is intended to be inlaid, and the ground or field, out of various sorts of veneers, all of the same thickness, fitting and fixing them together by thin paper on one face, and laying this, the open face downwards, as a whole upon a solid ground or board. This is veneered work. The other way is to cut the design out in separate pieces as above, but out of wood $\frac{3}{16}$ in. to $\frac{1}{4}$ in. thick, using the same process of marking out, and then putting the complete print of the design on to a solid ground or board, sinking holes by carvers' tools the required depth, and driving the pieces in, thus making a "solid inlay." In speaking of "marquetry" and "inlay," it was never quite understood which sort of work was indicated—whether the solid inlay or the wholly veneered work. As the workmanship of each was so distinct, he would use the term "marquetry" for veneered work, and "inlay" for the solid inlay above described. The author then dealt with the technical side of the question, describing the old-fashioned process, and that now generally employed, of marking and cutting the design in the wood, shading, &c. In his opinion, strong contrasts or too many different colours on the same panel should be avoided, except, perhaps, in the case of ivory in ebony, or mother-of-pearl in rosewood. One should depend rather upon soft harmonies, such as are seen in the best examples of Louis XVI. work, with their warm soft greys and yellows, or in the golden glow of the magnificent inlay in Pisa Cathedral. A broad effect should be striven for, to be produced by the quality and colour of the wood itself and by the direction of grain in which each piece is placed. On no account should scratching or engraving be used on the surface of the inlay, least of all to express roundness or relief in form. Dealing with a flat surface, an absolutely flat treatment should be followed. One should not aim at too great fineness, or intricacies and complications of lines in the design. It is useless to try to emulate the painter and attempt to make too much of a picture—the material is against it.

The author went on to speak of the difference between the quality of marquetry and inlay, taking the words to bear the meaning above attached to them. "Marquetry," being wholly the work of the saw, is apt to become a little too soft and undulating, and perhaps a little bit flabby in parts, under the influence of that more or less mechanical instrument; while "inlay," being partly the saw's work, and, in part, the work of carvers' tools—cutting in and working by hand—is capable of receiving a stronger, more vigorous treatment of outline, and is therefore likely to reach an individual and lifelike character of form unattained by the saw alone, which stamps it as finer work—from an art point of view; and even the occasional inaccuracies of fitting, and consequent different thicknesses of joints here and there, give it a distinct charm of its own. It also has a more pleasing quality of surface, especially as, in course of time, the inlay, being thinner, shrinks more than the solid ground, and thus becomes a little lower than the general surface, making a delightful play on the face of the work.

Solid inlay, with the inlay left in relief and afterwards carved, the author strongly condemned. Carving—as carving—is not improved by having its ground made of a different colour from itself. Inlay—as inlay—is not helped by having its surface frittered away by the undulations of carving. In conclusion, he urged them to sweep away all scratchy, uncharacteristic work, and get back to the face of Nature for inspiration in this as in other arts.

A paper by Mr. Heywood Sumner dealt with the simplest form of inlay in wood, namely, coloured wax stoppings, a form of inlay which has fallen into neglect. The Victoria and Albert Museum has some very fine specimens of old work of this kind. The effect is produced by incised lines, sunk spaces, and dots, all filled in flush with green and red wax. Though, after the lapse of 550 years, some of the stopping has perished, yet the beauty of design yielded by the firm incisions remains, and these old examples show what fine things can be done in this method by artists who understand the graphic possibilities and the limitations of flat surface decoration. Mr. Sumner went on to describe the method he had employed in some experiments of his own in this kind of work. First trace the design on the panel of wood to be incised; cut it, either with a V tool or knife-blade fixed in a tool-handle; clear out the larger spaces with a small gouge, leaving tool-mark roughness in the bottoms for key; when cut, stop the suction of the wood by several coats of white hard polish. For coloured stoppings, resin (as white as can be got), beeswax, and powder distemper are the three things needful. The melted wax may be run into the incisions by means of a small funnel with handle and gas-jet affixed; it is attachable to the nearest gas burner by india-rubber tubing, so that a regulated heat can be applied to the funnel. When thus attached and heated, pieces of wax of the required inlay colour are dropped into the funnel, and soon there will be a run of melted wax dropping from the end of the funnel-spout, which is easily guided by means of the wooden handle, and thus the entire panel may be inlaid with the melted wax. Superfluous surface wax is cleared off with a broad chisel so as to make the whole surface flush. The suction of the wood is stopped by means of white hard polish, otherwise the hot wax will enter the grain of the wood and stain it. Incised panels may be filled successfully with japanners' gold size and powdered distemper colour, using a palette knife to distribute the slab mixture. The melted wax, however, gives a more interesting and accidental result, and is better suited for designs that depend on spaces of colour-stopping for their effect. A close grain is the one thing needful in the wood. As to design, that which is best suited may be compared to a broad sort of engraving. Within certain limits, the manner of design is more free than is the case with inlay composed of veneers of hard material. The absence of beauty of material—*e.g.*, pearl, ivory, or choice woods—must be forgotten in the beauty, fancy, and austere freedom with which the incised decoration is expressed.

Replying to a question, Mr. Aumonier said that all the specimens shown in the room were labelled. Referring to one specimen, he pointed out that although two panels in it looked entirely different, because in one case the colour of the ground was light and in the other case dark, the prevalent idea was that the design was cut out of two veneers and dropped in, but that was not correct. Every part of the marquetry veneer was cut separately. They could not cut through the veneers, as they would waste a lot of their pattern by the thickness of the saws, although it appeared to be done so.

Mr. Crace said he thought Mr. Aumonier was mistaken, as he had seen it done in his own workshops.

Mr. Aumonier said that was not usual in the best work. Mr. Crace might do so, but it was only a primitive way of doing work. He knew what the work was. Elizabethan work was very beautiful, but it was very crude, and Mr. Crace would see nothing like what he spoke of in Louis XVI. work—it was not possible to find it.

Mr. J. D. Crace, in moving a vote of thanks to the readers of both papers, said that although he for the moment differed from Mr. Aumonier on a particular point, yet he had listened with great interest to the paper. It was particularly interesting to him, because one of the first times he came into those rooms was exactly forty-five years ago, when his father read a paper on the same subject and brought a professional marquetry cutter, who in the room cut specimens for those present to see the process of cutting. Amongst other points, he illustrated the fact that two panels were constantly made with reverse colourings by cutting through the ground and pattern by the one process. He might say with regard to that that the famous artists in marquetry, Boule, who did so much work of the best kind in France under Louis XIV., cut their work in that way, and it was a common thing to produce two pieces of furniture in which one was with brass inlaid on the black and the other the pattern of the work inlaid on the brass, so that it was very obviously utilising what otherwise would have been very costly waste of material. There was another point in the process which he did not think Mr. Aumonier touched upon. Instead of pouncing the pattern on paper, the finer French work was done by engraving the pattern on a metal plate and then transferring to paper. That, of course, was only worth doing when the work was to be produced more than once, but it gave a finer line than dotting. With regard to Elizabethan work, a great deal existed in this country in various forms, and much of it was very rough, although there were some fine pieces. He would mention particularly a number in Hardwicke Hall, where a great deal of old furniture remained undisturbed, and anyone visiting Hardwicke Hall could not fail to look on the interesting examples of English inlay work. Of course, some of the finest Italian work was to be found spread all over Italy, and beautiful pieces were to be found in almost all the important towns. Some of the very finest, however, was to be found at Bergamo. Although half inclined to agree with Mr. Aumonier about not combining carving with inlay, still, it was very difficult to stand opposite the cathedral stalls of Bergamo and repeat that, because there was some of the most beautiful work in the pilasters of those stalls that could possibly be executed—extremely delicate, and undoubtedly the effect was extremely refined and beautiful. He agreed all the same that it was not an art to encourage, but still a very beautiful example was to be found where he had mentioned. A very well known example was the marvellous cabinet made by Fourdinois in the Kensington Museum—a piece done for the Paris Exhibition of 1855. Then Mr. Heywood Sumner had mentioned wax inlay, which reminded him that in Italian work there was another form of the same method, only instead of wax they used whiting and glue. In the furniture room of Kensington there were many chests and other pieces done in that way. The ground, having had incisions made in it, these were filled in with whiting and glue and linseed oil. Of course, one of the most beautiful forms of inlay which the Italians executed was with ivory on walnut-wood or black wood. One ought not quite to taboo engraving on the surface, as sometimes it was almost necessary for explanation. In doing figures, for instance, if they wanted to indicate such features as the eyes, it could hardly be done by the saw for they came into the middle of the space—they would have the process of getting the saw through to begin with. Still, he admitted that the engraver should have a very subordinate part. As regarded the tinting, no doubt stained wood was largely used by the Italians and French. A great many of the pieces so charmingly tinted and coloured were very much brighter when made, and, undoubtedly, stained wood was used, and he saw no great reason against it. Still, the more nearly the work could be confined to the natural products undoubtedly it was more harmonious, and, as a rule, the more beautiful would the result be.

Mr. Butler Wilson said he had great pleasure in seconding the resolution, for he had listened to the two papers with great interest, having for a long time taken a great interest in furniture, and more recently in inlay. It seemed to him that probably the earliest examples of inlay were to be found in the Venetian work of the fourteenth century, when wood was inlaid on ivory boxes. It had struck him that inlay was practically mosaic in wood, but it was

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something more, and this desire to differentiate in different colours in the form of inlay had taken many curious forms. In the eighteenth century they would find, both in Dutch and English work, coloured straw work which was very remarkable, and gave a wonderful appearance of careful inlay. They also found in the sixteenth century inlays of coloured marbles. There was one particularly fine example at Kensington of various coloured marbles inlaid in white marble, which he went to see that morning. It was 3 ft. 6 in. by 9 in., and many scores of pieces of marble were inlaid. Then they came to the great veneerers —Boule work—and at the Kensington Museum they would find one commode, early eighteenth century, late Louis XIV., of tortoise-shell, mother-of-pearl, coloured ivories inlaid with brass. It was near the entrance to the Art Library, and was most elaborate in design, and it seemed to him that the whole thing was carried too far. They had again at Kensington a console table of Louis XIV. of engraved brass inlaid in tortoiseshell, the design being a triumphal car and attendants. But it seemed to him that in many of these cases there was a misuse and a misapplication of materials, and he was reminded of visiting the Island of Murano, where he saw some good modern glass, but was also offered glass watch-chains and slippers. He was rather drawn to the English oak panelling of the sixteenth century, such as that in the Sizergh room from Sizergh Castle at Kensington, and that for which they paid 1,000*l.* he thought was worth a great deal more. That was inlaid with holly and bog oak, and it seemed to him to be very simple and agreeable to the comparatively rude style which was adopted in that room. Other work in Italy which struck him as being simple and harmonious in its character was that at S. Miniato, at Monti, and Santá Croce at Florence. That, he thought, was simple and reasonable for one wood to be inserted into another, but directly the inlay became elaborate, as in the pieces he saw at Kensington, he thought there was a misuse. There was one most remarkable piece of furniture at Kensington. The brass background was reduced to a minimum with veneers, mother-o'-pearl, and tortoiseshell. The whole thing dazzled, and he could imagine a rich French room receiving that piece of furniture. It was like an exceedingly well-dressed woman carrying many gems, being the gem in a magnificent salon, yet who would probably be out of place in a simple English oak room. Thus, it seemed to him that the general needs of English domestic work were best met by the simple examples, such as those found in the Sizergh room.

Mr. W. G. Wilson said that in cutting one piece out of another the piece cut out would necessarily be smaller than the hole, to the extent of the thickness of the sawcut, so that were the cut-out portion used in forming the inlay of second panel the pattern would be smaller.

Mr. Aumonier said it was never done.

Mr. W. G. Wilson: I am supporting your contention, Mr. Aumonier; as the patterns in the two panels under discussion are of equal size, the last speaker is obviously mistaken.

Mr. Aumonier replied that it certainly would be. He would like to ask Mr. Crace one thing: Mr. Crace had spoken about engraving the pattern, and he would like to ask him if he could show an engraved pattern which would give a finer outline than the one he had at the moment in his hand, and that was done by pouncing?

Mr. Crace said he was not dealing with excellence. As a matter of fact, the French engraver did engrave, and printed from the plate.

Mr. Aumonier said he was speaking of English. Nearly all the marquetry cutters in London were Frenchmen, and they did it with pouncing, and he did not think it could be done better by engraving. They might do so in Paris, but it was not the usual way. With regard to Mr. Crace's excuse for engraving in the case of eyes, anything worth doing could be equally well done by the saw, and he would allow no excuse whatever for engraving, and would not himself have a single line engraved. They had to make the wood speak for itself, and put the grain in such a way as to give the feeling of the object they had to represent, and they did not want engraved lines on that. If they did want them, so much the worse for them, for they ought not to want them. They had to show what they wanted to show with the wood itself.

The Chairman said he was sure they would all join in the hearty vote of thanks to the readers of the papers. He had been rather surprised that neither of the gentlemen had mentioned the celebrated inlay work of the East in Egypt and India, which, perhaps, went further and was more elaborate than any of the Western. Mr. Butler Wilson had mentioned the marble inlays, but that hardly came under their purview that night, but at Agra he remembered a number of roses on tombs, and in the little roses which could be covered by a shilling there were thirty-two pieces of agate in each rose. It was marvellous, but it hardly came within the discussion that night. So far as he had seen that inlay work in Italy and France, Egypt and India, the Oriental inlays, although not so elaborate in fanciful designs, in regard to geometrical design and the elaboration of geometrical designs had never been approached by the Westerns. He was much interested when with Mr. Burges in the inlays he did for Worcester Chapel, Oxford. They were some of the nicest specimens of modern inlay work he had ever seen.

The vote of thanks was then carried unanimously, and a vote of thanks was also passed to Mr. Purdon Clarke and to the authorities of South Kensington Museum.

The Chairman said he had to announce that the next meeting would be held on Monday, April 21, when Mr. Alex. N. Paterson would read a paper on "Tradition in Architecture; its Function and Value."

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

THE Association of Municipal and County Engineers held a Midland Counties district meeting at Birmingham on Saturday last, when there was a numerous attendance of Midland members. The business meeting was held in the Council Chamber at the Council House, the use of which was granted by the Lord Mayor of Birmingham. Mr. E. G. Mawbey, C.E., of Leicester, presided, and among those present were Mr. J. Price, Birmingham; J. T. Eayrs, Birmingham; A. W. Greatorex, West Bromwich; C. F. Wike, Sheffield; R. J. Thomas, Aylesbury; E. J. Silcock, Leeds; J. Parker, Hereford; J. S. Pickering, Nuneaton; J. Lobley, Hanley; H. Price, Birmingham; J. Wilcox, Birmingham; Kidd, Swadlincote; and others.

The Deputy Lord Mayor (Alderman S. Edwards) said that on behalf of the Lord Mayor, whose illness they all deplored, he wished to extend to the Association a hearty welcome on their fourth visit to Birmingham. One of the principal objects of the Association was to apply the science of engineering to towns and rural districts, than which nothing could be more benificent and important.

The Chairman, in moving a vote of thanks, said the meeting that day was a new feature of the work of the Association, being a winter meeting for the discussion of papers. He looked forward to these meetings being very useful from an educational point of view.

Mr. J. Price, Birmingham, then made an appeal to the members for further support to the benevolent fund of the Association. The accounts for last year showed donations of 55*l.* 14s., and annual subscriptions of 124*l.* 1s. He thought the Association, with a membership of over 1,000, could do better than that.

Filtration of River Water.

Mr. A. J. Jenkins, Asso.M.Inst.C.E., read a paper on "The Filtration of River Water." He said as our large industrial centres were filling up the pressing demands for increased supplies had to be met, and as it was not practicable for every place to appropriate a lake in Cumberland or a valley in Wales consideration had to be given to the utilisation of the less pure streams and rivers, and to the means available for restoring them to something like the purity of their upper reaches. The question then arose as to whether rivers which were liable to pollution could be regarded as possible sources of water supply, and, if so, what means were necessary to prevent such a supply becoming dangerous to the health of the community. He would presume that a river liable to serious pollution had to be purified in the highest degree for domestic consumption, and that reasonable cost was permissible, and that the best of materials were available. In the treatment of river water there were three methods:—1. Sedimentation in storage reservoirs; 2. Slow filtration through sand, to which they were most familiar in England; 3. Coagulation by the addition of chemicals, and the subsequent rapid filtration, which was largely adopted in the United States. The advantages of sedimentation could not be too highly advocated. A few days' rest would effect the clarification of river waters containing all but the finest particles, and the deposit of mineral matter in suspension was accompanied by a very great reduction of the bacteria present. Apart from the reduction of the number of bacteria by what they might term precipitation, due to the mechanical sedimentation of the mineral matter, there was no doubt a great reduction in the number and vitality of the harmful bacteria by the bactericidal action of the harmless species working with the assistance of sunlight and air, and it might safely be assumed that the longer the period allowed for sedimentation the greater the degree of purity that would result. Filtration was merely the straining of water through fine insoluble media, and nothing was, of course, more suitable than clean fine sand. As the result of careful observation, it had been found that if a high degree of bacterial efficiency was to be maintained, the rate of filtration must not exceed four lineal inches per hour. This was practically two gallons per square foot per hour, or rather more than 1,000,000 gallons per acre per twenty-four hours. It was highly essential that this rate of filtration be regular, and controlled in such a manner that it could not possibly be exceeded, or the effect would be to wash the bacteria previously caught on the upper layers of the sand into the coarser materials below, or through the filter altogether. As filtering medium he suggested 3 ft. of fine sand, and below it 18 in. of fine to coarse gravel. The floor of the filter should slope quickly to the central drain, as a free outlet for all parts of the beds was of the highest importance to promote equal filtration throughout its full area. The drains should be in such a form that the filtered water was collected thoroughly and evenly, and so that when charging the filter from below the water was distributed without risk of disturbing the sand. It was of importance that the sand grains should be uniform in size and as fine as could be obtained. He had used sand so fine that over 60 per cent. of the particles would pass through a sieve of 4 900 meshes to the square inch, and the filters were giving excellent results. It was considered necessary to put under this fine sand a 6-in. layer of rather coarser sand to prevent it being washed away. The chief points to be regarded in the design of the inlet chamber were (1) regulation of the rate of inflow so as to maintain a constant top-water level; (2) arrangement so that the inflow of water should not unduly disturb the sand around it. To meet the former requirement a good automatic valve was necessary, and for the latter it was well to make the inlet basin fairly large, direct the inflow downwards so that it might eventually flow upwards and out of the basin with decreased velocity. It was also well to keep the wall of the inlet chamber above the sand level. The average cost of a large number of works, scattered over the whole of Northern Europe, had been about 10,000*l.* for uncovered and 15,000*l.* for covered filters, and at this figure first-class work could be carried out in England at the present time. In the United States the average cost had been 30,000 dols. per acre for uncovered filters and about half more for covered. The average cost of working the filters of the seven London Water Companies had been stated by Mr. W. B. Bryan, of the East London Water Company, to be slightly over 4s. per million gallons, the minimum being 3s. for the Chelsea Company, and the maximum 4s. 9d. for the Grand Junction and West Middlesex Companies. An attempt to pass turbid waters through sand filters without some preliminary treatment resulted in the very rapid clogging of the filter, or if the silt be a very fine one turbidity would still remain. The coagulent in most general use was alum. Lime might with advantage be used in certain cases where it also served a second purpose in the softening process sometimes required. Mechanical filters had been very extensively used in the United States, the reasons for adoption being small first cost, efficiency in dealing with

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muddy waters. The causes which had probably prevented their general adoption in England were heavy working cost, the success of the older methods, and our insular prejudice to innovations. Comparing the two systems, and considering working cost against first cost, there was practically no difference between the two. Summing up, Mr. Jenkins said purification of polluted water was accomplished in four ways, viz., by (1) dilution, (2) time, (3) sedimentation, (4) filtration. When the first two failed, or were not available, the third might be employed, but the general and safest method known was filtration.

Mr. E. J. Silcock, Leeds, said with respect to the sand used in the filters, he was disposed to think Mr. Jenkins was asking for too great a fineness when he spoke of 60 per cent. of the particles passing through a sieve of 4,900 meshes to the square inch. What was more to be aimed at was the degree of uniformity than of fineness. He thought 3 ft. should be the maximum depth; the principal thing was to have good sand, and not filter at too great a speed. Beyond 2 ft. of sand, the remaining part was of very little service, and merely formed a support for the surface doing the work. With respect to water obtained from gathering grounds, especially in Yorkshire, discoloration from peat was very marked in some cases, and very difficult to get rid of. They could not filter it out, and the great part of it must be taken away by sedimentation in the reservoir.

Mr. J. Parker, Hereford, said that at Hereford they were much limited for storage capacity and area for filtration, and therefore had recourse to mechanical filters. They had, however, some difficulty in getting the Local Government Board to sanction a loan for those filters.

Mr. Caink, Worcester, said experience had shown that water subjected to sand filtration gave the best health statistics. A number of towns supplied with water from the new red sandstone, which had the reputation of being of the highest quality chemically and bacteriologically, had a typhoid case rate ranging from 150 to 200 per 100,000 of population per annum, while towns supplied with river water, which received sewage pollution, when efficiently filtered in an adequate filtering area, even without sedimentation, had typhoid case rates ranging only from 20 to 50 per 100,000 of population.

Mr. J. S. Pickering, Nuneaton, said he had a very exhaustive report made upon the Washington Waterworks. After experimenting upon a very turbid water for nine months continuously with a mechanical filter and the English filter, they came to the conclusion that the mechanical filter gave the best all-round results, both as to getting a brighter water and also removing more bacteria. It seemed to be said by the bulk of American engineers that it was impossible to purify a turbid water through sand.

Mr. Watson, Birmingham, said he could not agree with the criticisms which had been made as to the depth of sand. He thought the proportions given were well suited to the kind of water dealt with.

Mr. J. Price, Birmingham, said in the filtration of water containing clay, it was a question of specific gravity.

Mr. Jenkins, in reply, said the depth of sand recorded in the filters was from a highly-polluted water supply.

Building By-laws.

Mr. F. C. Cook, Surveyor to the Urban District Council, Hinckley, read a paper on the position of local authorities in regard to building by-laws. There was, he said, no doubt as to the necessity of some such series as a guide to local authorities, and although criticism had been rife as to the wisdom or unwisdom of particular clauses, yet bearing in mind the difficulty of drafting by-laws of practical value, unassailable from a legal standpoint, one could not but admit that the authors of the model code had acquitted themselves well of their task. The objection was not so much to the model series in themselves as to the hard-and-fast rules which seemed to govern the officials at the Local Government Board in dealing with suggested deviations therefrom on the part of Local Authorities; consequently they had come to be looked upon not as intended for the guidance of Sanitary Authorities in framing by-laws, but rather as the laws of the Medes and Persians which altereth not. Those who had had the unhappy task of submitting proposed by-laws for the consideration of the Local Government Board could fully appreciate the hopelessness of attempting to obtain the official sanction to anything more than practically a mere verbal alteration of the model code. There appeared to be three main lines upon which any suggested measure of reform should run—(*a*) a levelling up, so to speak, by the compulsory adoption of modern by-laws in districts which were at present behind the times in this respect; (*b*) the formulation of a code of model by-laws confined to those points which experience had shown to be essential; (*c*) the empowering of local authorities to make supplementary by-laws and regulations specifying what might be regarded as matters of detail, and containing provisions specially suitable for the needs of different localities. There was evidence on all hands of dissatisfaction at the existing system, and he hoped that representations from the Council of the Association, as embodying the views of those who by every-day experience were brought into close contact with every aspect of the question, would have some effect with the Local Government Board.

Mr. J. Price, Birmingham, considered the chief fault was the want of elasticity on the part of the Local Government Board in dealing with by-laws.

Mr. Greatorex, West Bromwich, mentioned that two years ago a meeting of all the Midland surveyors was called by Mr. Price at which they discussed the model by-laws. He thought it would be a good thing if the surveyors in each district into which the Association was divided held such a meeting, and after drafting by-laws sent them to the Council of the Association to be amalgamated into a whole and submitted to the Local Government Board as a model set.

Mr. Lobley, Hanley, congratulated the author upon the moderation of his paper, as it was very difficult indeed to speak with moderation of the peculiar position of the Local Government Board.

Mr. E. Price, building surveyor, Birmingham, mentioned that the Royal Institute of British Architects had been interesting themselves in this question for some time, particularly with regard to the by-laws for rural districts, and there was no doubt they had got certain concessions in the last model by-laws by the Local Government Board for rural districts.

Mr. Lacey, Oswestry, considered that the paper did not leave much room for criticism, further than to air their grievances against the Local Government Board.

The Chairman said they had had great difficulties at Leicester, and the conclusion they came to was to stick to their old bye-laws which gave them greater powers than the new bye-laws, and to obtain further powers required in the omnibus bills.

Mr. J. S. Pickering, Nuneaton, moved that the Council of the Association be requested to take into consideration the existing unsatisfactory condition with respect to the making and administration of by-laws relating to new streets and buildings with a view to representation being made to the Local Government Board thereon.

Mr. J. Price, Birmingham, seconded, and it was carried unanimously.

Illustrations.

THE VICTOR HUGO MONUMENT, PARIS.

We give two views of this monument, recently erected in Paris near the house formerly occupied by Victor Hugo.

The monument, and the figures and subjects included in it, were fully described in the Letter from Paris in our issue of March 1. We need only remind the reader here, that M. Barrias is the sculptor to whom the whole design is owing; M. Allar having been responsible for two out of the four bas-reliefs with which the pedestal is decorated. The two which appear in these illustrations are those by M. Barrias.

SKETCHES AT VENICE AND CAUDEBEC.

The two sketches by Mr. C. Wontner Smith, published in this issue, are from the set for which the Pugin Travelling Studentship was awarded. One of them shows an angle of the ducal palace from a different point from that of most illustrations. The other is a late Gothic doorhead, with a grotesque human face carved in it, at the church of Caudebec-en-Caux, Normandy.

DESIGN FOR A ROOF TO A PICTURE GALLERY.

This is the design which obtained for its author, Mr. Lionel U. Grace, the Grissell medal of the Institute of Architects this year. The Grissell medal was founded as an annual prize for the best design for some problem in practical construction, the subject to be set by the Council of the Institute. It is a very useful prize, as stimulating that study of practical construction which is unfortunately so much neglected among the younger generation of English architects; it is to be regretted that the competition for it is generally but small in comparison with that for the prizes given for artistic design, though in the present year there was a rather better contest than usual.

The following is the author's explanation of his design:—

"After a careful study of the various picture galleries in London I came to the conclusion that this was the most satisfactory form of roof as regards the proportion of light obtained, and by far the best method of lighting a picture gallery 60 ft. by 30 ft., as required by the conditions of this competition.

The roof is constructed with steel trusses at 12 ft. centres, sufficiently indicated to enable an engineer to carry out the design with economy. These support the R. S. purlins which carry the continuous skylight, and coke breeze concrete filling with necessary intermediate joists, &c.; a ventilating duct is formed at the apex, with electric fans at the gable ends.

The internal decoration is intended to be in fibrous plaster secured to the coke breeze, but wood panelling would be employed where obviously necessary.

The allegorical decoration in the gable ends, together with the carving in the panels, would be about 4 in. in relief, although in practice, under the circumstances, one would be rather chary about using decoration of this description."

ARCHITECTURAL SOCIETIES.

Edinburgh Architectural Association.—A meeting of the Edinburgh Architectural Association was held on the 2nd inst., in the rooms, 117, George-street, Mr. Henry F. Kerr, the President, in the chair. Mr. James Bruce, W.S., submitted the following motion: "That it be remitted to the Committee of Management to consider the provision made in the Scottish Universities for the teaching of architecture, and in the event of the Committee being satisfied that the same is inadequate, to report whether in the opinion of the Committee an application should be made to the Trustees of the Carnegie Trust, with a view to more adequate provision being made for such teaching." Mr. Bruce remarked that in the University of Edinburgh there were fifty-two Professorships, but among them all there was not one devoted to architecture. In the Faculty of Law there were no fewer than seven Professorships. When they thought of the enormous importance of architecture to the health, happiness, and comfort of the people, it was really a very extraordinary thing that in the University of Edinburgh there was no such thing as a Professorship of Architecture. More than that, so far as he knew, in no Scottish University was there any provision made for a Professorship of Architecture. The Carnegie Trust had just been considering the wants of the Scottish Universities. The Universities had been asked to indicate where their wants lay, and although he had gone over the statements published on behalf of the University authorities, in not one of them was there even a hint that there was any lack in the matter of the teaching of architecture. Surely that was a strange position for the Universities of Scotland to occupy. Accordingly he thought it would be well for a body such as the Edinburgh Architectural Association to directly press upon the Carnegie Trustees the advisability of something further being done in the matter of the teaching of architecture in the Universities. He used the

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phrase "something further," because to some slight extent the matter was attended to in the University of Edinburgh through the Chair so well occupied by Professor Baldwin Brown—namely, the Chair of Fine Art.—Mr. G. S. Aitken seconded. The Chairman, in supporting the motion, suggested that the matter, instead of being remitted to the Committee of Management only, should be remitted also to the Council. He read a letter from Professor Baldwin Brown, who expressed cordial agreement with Mr. Bruce's motion. Even though the Carnegie Trustees had too many claims before them to permit them to do anything in the matter immediately, it would be a good thing to put the demand for a Chair of Architecture, or some agency of the kind, distinctly before the public. The Chairman added that he had seen a good deal of what was done in the teaching of architecture both in France and America, and he was perfectly confounded with the extraordinary development of the teaching of architecture in these countries. In some cases they had twenty-six or twenty-seven teachers of one kind or another in that subject alone. Why should it not bulk more largely in Scotland? The motion was unanimously adopted. Afterwards Mr. Wilson Beatson read a paper, written by Mr. James Miller, I.A., on the "Glasgow International Exhibition of 1901." The paper was illustrated by drawings, photographs, and limelight views.

ARCHÆOLOGICAL SOCIETIES.

ROYAL ARCHÆOLOGICAL INSTITUTE.—At the general meeting on the 2nd inst., Judge Baylis, K.C., in the chair, Mr. J. C. Prætorius exhibited a Venetian point lace apron, kindly lent by Lady Reade, of Carreglwyd, and supposed to have belonged to Lady Jane Plantagenet, Maid of Honour to Queen Elizabeth. Mr. E. Towry Whyte exhibited several rare Egyptian antiquities from his collection, notably a small bronze mummy-case in the shape of a fish, together with the bones of the perch (*Lotus Niloticus*) which were found inside; a wooden bolt of ingenious construction; and a drill boss of granite of small size. Mr. Whyte suggested that if the boss heads of this form were used in connexion with making fire, the symbol of Rā, the Sun, was derived, which would account for the dot in the centre. Mr. E. B. S. Shepherd then read a paper on the "Church of the Greyfriars in London." He said that of the monastery of the Greyfriars, Friars Minor, or Franciscans, which once occupied the ground where Christchurch, Newgate-street, and Christ's Hospital, now stand, but little remains. But the later buildings follow to a great extent the lines of those which preceded them; and much information fortunately exists concerning the monastery in an account of the house, together with a list of persons buried in the church, compiled about the year 1526 and preserved among the Cotton MSS.; the account itself is familiar to scholars from the transcription printed by Brewer in his "Monumenta Franciscana," and the list of burials from the abridged and somewhat inaccurate copy in J. G. Nichols's "Collectanea." The convent was founded near Newgate in 1225, and the various buildings of which it consisted were built for the friars by citizens of London during the thirteenth century, the chapel being built by Sir William Joiner, Mayor in 1238. Towards the end of the century this convent attracted in an extraordinary degree the patronage of Royal and noble persons. It received benefits from Henry III., from Gilbert de Clare, Earl of Gloucester and his sisters, from John, Duke of Brittany, "specialissimus pater et amicus fratrum minorum," and many others. In 1306 Queen Margaret, the second wife of Edward I., began to build a new church for the friars on an enormous scale; and this was finished in 1348, by the assistance of many exalted persons, including Queen Isabella and Queen Philippa. The number of burials in the church was very large, about six hundred being mentioned in the Cotton MS. Amongst these were the Queens Margaret and Isabella, Margaret Segrave, Countess of Norfolk, granddaughter of Edward I., and Robert Lord de Lisle, to mention only a few of the most important; and some whose bodies were buried elsewhere, Eleanor, wife of Henry III., Archbishop Peckham, formerly Provincial Minister of the Friars Minors, Edward II., and others, received spiritual benefits from the friars by the burial of their hearts within the walls of this church. The main arrangements of the church can be made out with certainty; it was about 300 ft. long and occupied the whole of the ground now taken up by Christchurch, Christchurch passage, and the present burial ground; in width it was divided into three alleys, a wide one in the middle and a narrower one on either side, and in length into fifteen bays, of which the first six on the east correspond with the six bays of the present Christchurch; the seventh bay coincided in width with that of the existing tower, the eighth with Christchurch passage, and the remaining seven with the graveyard. The first seven bays on the east contained the quire in the central alley and two chapels in either of the aisles; on the north were the chapels of Allhallows and of St. Mary; on the south those of the Apostles and St. Francis. The eighth bay, as now, was a passage, and is described in the Cotton MS. by the designation "Ambulatorium inter chorum et Altaria," "the altars" forming the eastern bay of the nave; over it stood the tower, poised, perhaps, as at King's Lynn, over the two parallel arches which spanned the central alley at this point. At either end of the passage were doors, that on the north leading to the monastery, that on the south to Newgate-street. In the eastern arch of the nave was placed the rood, and against the screen beneath it crossing the church were four altars, in the north aisle that of St. Mary, in the nave the altar of the Holy Cross and the Jesus altar, one on either side of the rood, and in the south aisle the common altar, "altare commune," the space before these altars being enclosed by screens from the rest of the church. In addition to the main divisions of the church, it is possible from the list of burials to fix with considerable certainty the positions of altars, stalls, piscinas, and other fittings, and by a comparison with the Blackfriars' church at Norwich, a very probable conjecture can be made concerning the first church which preceded that begun by Queen Margaret in 1306. It seems to have coincided with the north aisle of her quire, and it is by no means impossible that instead of pulling down the old church, she made it serve as an aisle to the new one. The remains of friars' churches are scanty in the extreme, so that the fullness of the information concerning this one is particularly welcome.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—A meeting was held on April 2, Mr. C. H. Compton, Vice-President, presiding. Mr. Thomas Sheppard, Curator of the Hull Municipal Museum, submitted a drawing of one of two small bells recently found in the course of excavations near Duffield. The bells bear neither inscriptions nor dates, but are precisely similar in shape and measure—6½ in. in height by 6½ in. in diameter at the mouth. They were probably used at the altar, and were sacring bells. Dr. Winstone exhibited some beautiful lacework of the seventeenth century, representing Herod and Herodias with her daughter bearing the head of John the Baptist on a charger or dish. A memorandum stated that the lace was worked with thread which cost one guinea per ounce, and the dresses of the figures are profusely ornamented with small pearls. Mr. I. C. Gould exhibited two casts, one square, the other round in form, of white metal coated with copper recently dug up in a garden at Upminster. He had submitted these casts to Mr. C. H. Read and Mr. Hill, of the British Museum, and found that the square specimen bears on its face the cast of a well-known coin of Syracuse, the other being the cast of the obverse of an Italian medal of the sixteenth century. Mr. Gould thought that, though possibly modern forgeries, the casts may more probably be imitations of the antique made fifty or more years ago, not necessarily with the idea of deception. Mrs. Marshall brought for exhibition a piece of glass seemingly Roman, beautifully iridescent, which she had herself picked up at Alexandria. Dr. Birch exhibited, on behalf of Miss Gertrude Winstone, the photograph of an incised leaden plate found recently at Bath, which was of much interest. It appears to have been nailed or fashioned in some way upon a coffin or chest containing the remains of a sister or nun named Alfgifu, a deceased member of the celebrated nunnery of Bath which was first founded in A.D. 676 by Osric, petty king or subregulus of the Wicii, a tribe inhabiting Worcestershire and adjacent countries. Bertana was the first Abbess. The period of the nunnery, A.D. 676-775, must be that of the relic in question, which consists of a leaden plate 4⅛ in. in length by 3½ in. in width, bearing on the front an incised Greek cross, with a circular border uniting the arms, and a St. Andrew's cross at the intersections; the back of the plate has simply a plain Greek cross. The arms of all the crosses as well as the circular border are covered with inscriptions of sacred characters, partly decipherable. The relic was discovered by Major Davis at about 17 ft. below the present level of the ground, in a portion of the hypocaust of the old Roman baths, the site of which was afterwards the cloister of the Saxon nunnery. A valuable paper on "Maiden Castles" was read by Mr. A. R. Goddard, of Bedford. This interesting subject was very ably treated, and at considerable length, Mr. Goddard having traced a list of at least twenty-six pre-Roman encampments bearing this singular title, which is also applied to roads and ways, a title that would seem to have been given to these encampments, not by the original makers, but by a people that came into the country long after their time, when the old ramparts and trenches had been left in desolation for many centuries. After reviewing the various theories as to the origin of this name and its meaning as applied to these early strongholds, Mr. Goddard observed that the word "maiden" is certainly a Saxon word, and the map seems to confirm the idea that the Saxons bestowed it upon these fortresses, for it shows that they occur all over the country which was Saxonised, even where, as in Cumbria and Scotland, a short Saxon lordship was later displaced by the prevalence of the peoples of Celtic origin. If, then, the name is Anglo-Saxon, the special reason for its application to these deserted and desolate early strongholds, situated as they are generally in wild and open country, is of particular interest. The Anglo-Saxons did not attach this name to forts of their own construction, and the map, Mr. Goddard pointed out, seemed to suggest that its application to these much earlier strongholds was owing to the Danish invasions. He ventured to suggest that when, in the eighth and ninth centuries, the Danes came ravaging the north-eastern parts of the country, and the towns of the Saxon-English were incapable of defence, owing to neglect, it was imperative to find a place of security for the women and girls and children, when the men had gone out to fight the invaders. Then these deserted enclosures in the hills and wilds were thought of as places of refuge, and in after years may have become known and pointed out to younger generations as the "Maiden Bushes and Ways," just as the glens and vales in Scotland, where the Covenanters met, were pointed out to those that came after them; and in lapse of time the old names lingered on, while their meaning was forgotten. The Rev. H. J. D. Astley (the Chairman), Mr. Gould, Mr. Duppa Lloyd, and Mr. Patrick took part in the subsequent discussion.

ENGINEERING SOCIETIES.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.—At a meeting of the Civil and Mechanical Engineers' Society held on the 3rd inst. at St. Ermin's Hotel, Westminster, Mr. E. Ault read a paper on "The Ventilation of Drains and Sewers." He began by quoting the maxim laid down by Dr. Carpenter, that "motion is the first sanitary law." Air was an active carrier, a sustainer of health and life. The freer the action of air the better it was for the preservation of health. It was the province of the engineer to devise means for ventilation, and efficiency should be his chief aim. Attempts at ventilating drains and sewers so far had been crude. The lecturer then considered the various points essential to efficient ventilation of drains and sewers. Sewage always gave off gases, and their constitution and nature had been made the subject of experiments by various engineers. He dealt with the minimum volume of air necessary for ventilation, the direction that ought to be given to the flow of air, and the mechanical means for producing flow. In this connexion he described his apparatus for ventilating sewers, showed the essential and practical elements of design in ventilating apparatus, the working of fans and motors, and examples of practical application of elements of design, a great many of which were shown on a screen. In conclusion, he said he had tried to convey to his hearers in a brief manner the essential principles of his system of sewer

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ventilation, and he hoped he had given the chief points in dealing with the sewage of towns as affecting the health of their inhabitants. A discussion followed, in which Messrs. Brewster, Hodgson, Ackermann, and Shone took part, the latter observing that there was no branch of engineering more neglected than sanitary engineering, and yet nothing was more important for the welfare of the population.

SOCIETY OF ENGINEERS.—At a meeting of this Society, held at the Royal United Service Institution, Whitehall, on Monday, the 7th inst., Mr. Percy Griffith, President, in the chair, a paper was read on "Australian Timber Bridges and the Woods used in their Construction," by Mr. Herbert E. Bellamy, City Engineer, Rockhampton, Queensland. The author, at the outset, pointed out that bridges built entirely of timber were now seldom erected in England, but that in the Colonies timber bridges were very extensively constructed. He then proceeded to discuss the life of such bridges, which, he said, was very varied, but might be put at from thirty-five to fifty-five years, according to location and other circumstances. He then proceeded to describe a timber bridge which he had recently designed and erected in Queensland. This bridge is 320 ft. long and 18 ft. 6 in. wide. It spans a creek 10 ft. deep at high water, and which also has 20 ft. of black mud below the bed. In flood times the waters rise 25 ft. above the level of ordinary high-water mark. The piles, which are of ironbark timber, well creosoted, were dealt with in detail, the sizes, lengths, methods of scarfing, driving, tests, and covering with Muntz's metal being given. The cost of driving the piles complete, including materials, labour, plant, &c., was given at 4s. 6d. per lineal foot. The decking and its members are of spotted gum, and the cost was stated to be 9os. per square, including all material and labour. The total weight of all the timber in the bridge as fixed is about 200 tons, whilst the weight of the ironwork fixed is 4½ tons. The total cost of the structure, including a small portion of the approach roadway, was 1,900*l*. The author then described the different varieties of Australian timbers—seventeen in number—mostly used in bridge building and for other constructive purposes, specimens of all of which were exhibited. The author referred to the distribution in the Colonies, and the qualities, &c., of the principal trees. The strengths and sizes of the leading timbers were also given. Of different kinds of timber suitable for bridges, ironbark, spotted gum, blue gum, bloodwood, blackbutt, box, mahogany, karri, and swamp mahogany were stated to be amongst the most durable. Ironbark, mahogany, blue gum, bloodwood, swamp mahogany, turpentine or peppermint, tea, she pine, and cyprus pine are very durable when constantly immersed in water or in wet ground, and are therefore well adapted for piles, &c., for the foundations. Karri, which is a member of the eucalyptus family, is largely used for street paving. The author expressed the opinion that the good qualities of Australian timbers were not fully realised, otherwise these woods would be more extensively used both in Europe and America. The author next described in detail the appearance of good timber, the chief qualification being slowness of growth as shown by the narrowness of the annual rings. He then elaborated the various methods of seasoning, which consist either in evaporating the sap by air-drying, or in dissolving it in water and afterwards sun-drying the timber. Artificial drying is rarely resorted to with timber for engineering purposes. The author then passed on to a consideration of the general causes of decay and the destruction of timber by worms and insects. The destructive methods adopted by the white ant and the *teredo navalis* for invading timber were explained, and the means employed for its protection against these pests were pointed out. It was stated that copper sheathing was not permanently effectual in resisting the attacks of the *teredo*, but that creosoting, properly carried out, was the most successful of any process yet known. The preservation of timber was then considered, and the author dealt with painting, charring, creosoting, and impregnation with metallic salts. The latter method, however, has not in all cases given satisfactory results.

SCOTTISH ASSOCIATION OF MUNICIPAL ENGINEERS AND SURVEYORS.—This Association, which is now formed, held its inaugural meeting on the 5th inst. in the Athenæum, Glasgow, and was attended by representatives from thirty-four burghs and other authorities in Scotland. The constitution, which had been prepared by a provisional committee, was submitted for approval, and adopted. The meeting proceeded to appoint the officials of the new Association, and the City Engineer of Glasgow, Mr. A. B. M'Donald, was unanimously appointed the first President. The vice-presidents are Mr. A. J. Turnbull, Greenock, and Mr. Thomas Nisbet, master of works, Glasgow. The first general meeting of the Association is to be held in Edinburgh in June next, when the President will give his address.

SANITARY INSPECTORS' ASSOCIATION.

AT the monthly meeting of the Sanitary Inspectors' Association, held on Saturday at Carpenters' Hall, London Wall, further consideration was given to a scheme of amalgamation with different associations in the United Kingdom. The Council submitted a proposal for federating with the South Wales Association, the National Union and Sanitary Inspectors (North-western Counties) and the Scottish Association.

In the subsequent discussion several representatives from the provinces spoke in approval of the scheme—notably members from Middlesbrough, Batley, and Lincoln. On a vote the principle of federation was approved by twenty-five against thirteen. The Council was then instructed to enter into negotiations with the other associations named.

PRESERVATIVE PROCESSES FOR WOODWORK.

BY H. C. STANDAGE.

THE various changes of temperature and of humidity and dryness to which woodwork in building is subjected renders it almost impossible to formulate a universal remedy against decay. It is a well-established fact that the most destructive agency causing decay in wood is the subjection of it alternately to wet and dryness. Wood that has been kept continually in water has remained sound for a much longer period than has wood which has been allowed to become wet, then dry, then wet again, &c. The various positions in which the wood is located determine to a great measure the means of protection required, next to which comes the nature of the wood itself, some woods being less subject to decay than others.

In the following processes means will be found of finding a remedy for almost every case of wood requiring preservatives from exceptional decaying influences.

Preservation of Wood against Fire.—Methods for the impregnation and painting of wood with materials that resist fire have been patented in scores, each of which processes have been extolled by the inventors as being the acme of perfection. From the writer's experience with such compounds, the best preservative agents are such non-combustible substances as soap, glue, gelatine, &c. A soap varnish is one of the best possible compounds for preventing light woodwork readily igniting. Such varnishes are made thus:—Dissolve good tallow soap (commercial "curd" soap is such an one) in warm water to a thin fluid of the consistence of milk, and then reprecipitate the soap from the fluid by gradually adding a solution of sulphate of copper, sulphate of iron, and any other mineral solution which form soaps with oils and fats—*e.g.*, sulphate of magnesia, &c. The flocculent precipitate is collected, washed in water, and then dissolved in warm oil of turpentine to the consistency of varnish. The fluid thus made possesses all the properties of a varnish, and it is applied to the woodwork in the same manner; for plain unstained wood, which should first be sized with glue or gelatine, such soap varnishes are excellent, as they will not readily blister by the fiercest heat, and except the wood be held in a furnace or otherwise be subjected to fierce heat, it will not be consumed or ignite. If the wood be of a soft porous nature it may be impregnated with the sebaceous matter by these means: steep the wood for some time in a boiling hot solution of soap, and then steep it in a solution of one of the metallic salts mentioned above. Good tallow soap only should be used, not a common soap which contains rosin or other adulterating bodies in "fillers." By this means the sebaceous matter will be precipitated in the pores of the wood, and thus render it fireproof for the light framework of scenery in a theatre and similar structures which are subjected to risk of ignition. This process forms a good preservative one.

Waterglass, the chemical name for which is silicate of potash or silicate of soda, is a substance which renders wood incombustible. The method of treating the wood is to dilute 1 part of waterglass with 3 times its bulk of water and steep the wood in the solution for 24 hours; then allow the wood to dry in the air for a few days, and afterwards repeat the steeping for a further period of 24 hours, and again dry. Repeat this three or four times, and finally completely dry the wood and lay on it a compound composed of 1 part of cement with 4 parts of waterglass. Allow the first coat to dry, and in 24 hours give a second application of the compound, but not more cement in it, and after this has dried, brush over it a solution of waterglass only which will give the wood the appearance of being varnished. Wood so prepared is perfectly fireproof, and also proof against rotting, insects, &c. In using the cement compound only mix just as much as can be used at a time, as it sets very quickly.

The following three processes are from an American source:—

To Render Wood Fireproof and Flexible.—These results are obtained by saponifying the rosin in the wood, and the acids in same neutralised with alkalies obtained from wood ashes (potash pure and simple). The carbonates of alkaline bodies are preferable for saponifying and rendering vegetable bodies more or less flexible and fireproof, therefore dissolve carbonate of potash or of soda in cold clear water, and add calcic hydrate (slaked lime) to the solution, and soak the wood in this alum solution until a coating $\frac{1}{16}$ in. or more thick has been formed on the surface. This will be accomplished in five or six hours. A ¼-in. thick coating will be sufficient to render building timber fireproof, but in case great flexibility with absolute non-inflammability is desired a thicker coating, or even an entire saturation of the timber will be necessary. In this case hydraulic pressure is required to force the compound into the wood.

To Render Wood Incombustible and Impermeable.—The following process petrifies the wood, so to say, without the latter losing its ordinary appearance. It will bear any degree of heat without the primary substance suffering any change except the formation of a very thin charred coating, which falls off on the slightest touch. The process is as follows:

Heat in a boiler

55	parts of	water to 113 deg. F., and then add
55	,,	sulphate of zinc,
22	,,	potash,
44	,,	alum, and
22	,,	manganic oxide.

When all are dissolved add gradually 22 parts of sulphuric acid of 66 deg. until the compound is thoroughly saturated, then place the pieces of wood into the compound in such a manner that they lie about 2 in. apart, allowing them to remain for three hours, and then dried in the open air.

Another method of rendering wood fireproof is to boil the wood first in a solution of potassic sulphate and after drying, heat it together with a mixture of coal-tar and argillaceous admixture by which it acquires a durable coating of a mixture of asbestos and fireclay. Heat the wood thus treated in a steam vat between layers of clay, whereby the coating is firmly united with the wood. Timber prepared in this manner is fireproof and weather-proof and well adapted for building purposes.

Waterglass when used alone as a fireproof coat for wood should be thinned down with five or six times its own bulk of water and several coatings given, allowing each one to dry before putting on the next. The water should be soft, *i.e.*, free from lime, and the solution applied warm. Before applying it, all grease should be removed from the wood.

Fireproofing Fluids.—Ingredients:—

Sulphate of iron (green vitriol, *i.e.*, copperas).
Alum.
Pipeclay.
Water.

Preparation.—Dissolve the alum and iron sulphate in water until no more will dissolve in it, *i.e.*, that is a saturated solution is obtained.

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paint the wood with this solution hot, giving two applications following each other, and allow it to dry. Meanwhile mix in pipeclay with a weak solution of sulphate of iron to the consistence of paint, and then paint this on the woodwork (for use on shingles, &c.).

Ingredients :—
- 2½ parts of sulphate of zinc.
- 2½ parts of alum.
- 1 part caustic potash.
- 1 part manganic acid.
- 1 part sulphuric acid.
- 1 barrel of hot water.

Preparation.—Put the first three bodies into the hot water and then, when dissolved, add the manganese oxide, and lastly the acid.

Pack the shingles loosely in another barrel and fill with the liquid, holding the shingles under the mixture. Fill up the first barrel also with shingles, soak for three hours and pile to dry, and repeat until all the shingles are fireproofed. After the house is shingled paint with oxide of iron paint tempered with other mineral colour in boiled linseed oil, and mixed to suit the taste or shade of colour desired.

No. 3.—Burnell's process (known as burnellising) of rendering timber fireproof consists in treating it to a solution of chloride of zinc prepared by dissolving 1 lb. of chloride of zinc in 4 gallons of water. Soak the wood in the fluid for forty-eight hours for every inch of thickness, and afterwards allow to dry, which will occupy fourteen to ninety days.

No. 4.—Ingredients :—
- 1 part alum.
- 1 part sulphate of copper (blue vitriol, or bluestone).
- 100 parts of water.

Dissolve the salts in a small quantity of hot water, and then mix it with the bulk of water and steep the timber in the fluid for four to five days, weighting down same so as to thoroughly immerse it; then take out the wood and dry it thoroughly before being used.

No. 5 (*Payne's*).—This process consists in impregnating the wood in a vacuum with a strong solution of sulphate of iron, and afterwards forcing into the timber a solution of sulphate of lime, or any of the alkaline carbonates, such as carbonate of soda, by which means the oxide of iron becomes insoluble and the wood rendered incombustible.

Non-inflammable or Fireproof Paints.

No. 1.—Ingredients :—
- 2 lbs. finely-pulverised glass.
- 2 „ „ porcelain.
- 2 „ of any sort of stone in powder.
- 1 „ calcined lime.
- 3 „ silicate of soda (water glass), commercial strength.

Preparation.—Pulverise the solid ingredients as finely as possible, and mix them by sifting through a sieve; then moisten them with water, and intimately mix them with the water-glass. This yields a mass of syrupy consistence, that may be employed for painting, either alone or mixed with colour. The addition of the lime gives a certain unctuosity to the mass for whitewashing, and its combination with the silicic acid of the soluble glass serves to bind the other materials together. These elements may even be replaced one by another, but it is always well to preserve the lime. Potash instead of soda water glass may be used, but the latter is less expensive. The coating is applied with a brush as uniformly as possible over the surface to be protected. The first coat hardens immediately, and a second one may be applied six hours or more afterwards. Two are sufficient.

No. 2.—Ingredients :—
- 1 part common lime, freshly slaked.
- 1 „ hydraulic lime.
- 1 „ siliceous or argillaceous matter (as sand or pulverised slate).
- Cow's milk, q.s.
- Colouring matter (ordinary pigment), if desired.

Preparation.—Mix the solids with sufficient milk to give the compound, when thoroughly mixed, the proper consistency for laying and spreading with the paint-brush.

The use of chloride of zinc and of water-glass has two drawbacks which militate against their extensive use, thus: A paint consisting of zinc chloride volatilises when the material on which it is spread is heated or exposed to flame and its vapours are insupportable by human beings. It would, therefore, be difficult, if not altogether impossible, to enter wooden dwellings painted with the zinc salt when on fire, and thus the salvage of furniture, &c., would be obstructed. The water-glass paint, on the other hand, is liable to be washed away when exposed to rain or other watery influences; and so likewise with the alum and sulphate of copper compound, this is liable to be washed out, more or less, from the wood.

Waterproofing and Preservative Processes against Dry Rot, Insects, &c.—Lime salts convert soaps into insoluble matters. Advantage is taken of then saturating the wood first with a solution of soap in water, and then submitting the saturated wood to the action of a salt of lime or else steeping in an acid. The soap that has penetrated the pores of the wood is decomposed and formed into calcic sebate, which fill the pores with an insoluble compound. Another process of using lime as a preservative of wood is slake lime (calcic oxide), in a solution of chloride of lime, and use this as a wash for the wood.

This wash is a preservative against insects more than against water. Saturating the wood with common salt is also a good preventer of insects attacking the wood. The wood, if planted in the ground, may be set in a bed of salt, which, by being gradually dissolved, is absorbed by the wood.

For pine, acacia, larch, beech, cherry, poplar, and alder wood, a solution of sulphate of copper is a good preventer of ravages of insects in the wood. (14 ozs. of the sulphate per 10 gallons of water is sufficient strength for the solution).

Coal tar is a familiar agent in use for preserving wood from dry rot. The process of impregnation is this :—Let the wood be as well seasoned as possible, and steep it for a quarter of an hour in the following mixture :—

To 50 parts of boiling hot coal tar
Add 3 parts of common salt,
5 parts of sulphate of iron,
3 parts of alum,
13 parts of rosin.

Mix thoroughly and boil the compound to the proper consistency. As soon as the wood is taken from the compound a powder consisting of the following ingredients is spread over it :—

Coal cinders very hard and thoroughly burned	50 parts.
Sulphate of iron pulverised	5 „
Lime pulverised	15 „
And glass pulverised, any quantity	95 „

Store the wood then prepared in a dry place.

Rosin is also a substance which will retard the decay of wood from rotting, but as it is a substance which is decomposed by the action of alkalies it would not preserve wood which is subjected to the action of alkaline waters. The best method of using this substance is to combine it with the following ingredients :—
- 25 parts of rosin.
- 2 „ linseed oil, fluid measure.
- 150 „ white sand.
- 1 pint sulphuric acid.
- 1 „ black oxide of copper, finely ground.

Preparation.—Melt the rosin at a gentle heat and then stir in the oil, and when this has mixed, gradually mix in the sand with constant stirring, and finally mix in the acid and the copper oxide; incorporate well, and paint the compound on the wood while hot.

A modification of the above compound is composed of the following ingredients :—
- 4 to 8 parts of linseed oil.
- 50 parts of rosin.
- 40 parts of whiting.
- 200 to 300 parts of sharp white sand.
- 1 part of red oxide of copper.
- 1 part of sulphuric acid.

Preparation.—Boil the oil and rosin together and then mix in the whiting and sharp sand, and when this pasty mass is thoroughly boiled add the red oxide, and lastly the sulphuric acid. Stir up well, and lay the compound on hot with a stiff brush. It dries at once, and forms a crust as hard as stone.

Carbolic acid and creosote are antiseptics, and are generally considered waterproofers of wood; but this is not the case, as in process of time the wood fibre will rot away, notwithstanding that it is perfectly permeated with the creosote. So much so will the wood decay, that although it retains its form, there will be nothing combustible left in it; that is, such rotted wood will simply smoulder like so much tinder, evincing that the resins in the wood have been absorbed, or otherwise changed in nature as to lose their combustibility. Creosote is largely used for impregnating railway sleepers to prevent dry rot, for which purpose special apparatus is used; but for ordinary wood posts, palings, and wooden shanties, an application of the coal tar by the aid of a paint-brush is sufficiently efficient.

Another successful antiseptic or preventer of decay from insects is corrosive sublimate (chemically called bichloride of mercury). The method of application was generally known as "kyanising." A saturated solution of the salt is made in a wooden tank, which is constructed in such a way that no metal comes in contact with the fluid in the tank, and in this solution the wood to be "kyanised" is steeped on an average of 24 hours for every inch in thickness for boards and small timber, but for large baulks two to three weeks are required. The proportion of corrosive sublimate varies according to the porosity of the timber to be saturated; the maximum amount is 1 lb. of the mercury salt per 10 gallons of water (tepid is the best to use, as it dissolves the salt more rapidly) and 1 lb. per 15 gallons the minimum. A load of timber, 750 cubic feet, will be saturated by the aid of 1½ lbs. of the salt in the requisite quantity of water. By the Rayner process, the wood, while in a vacuum, is impregnated with Other processes that have been used of impregnating timber with fluids, so as to preserve the wood from the ravages of insects and also against dry-rot, are the following :—(*a*) The wood is first steeped in a solution of phosphate of soda containing 7 per cent. of the salt; the wood is allowed to dry, and then treated with a solution of chloride of barium containing 13 per cent. of this salt, whence phosphate of barium is formed in the fibre of the wood. (*b*) The wood is boiled in a solution of gallo-tannic acid (the proportion being immaterial); the result is the formation of an insoluble substance in the pores of the wood. One solution only is necessary for oak, as there is naturally present a great deal of tannin in oak, which is naturally a preservative against insects. A modification of this process was to steep the wood in a solution of acetate of iron; after steeping, the tannin acid bath.

(*c*) The timber, cut in proper lengths, is packed vertically in an iron reservoir provided with a tight-fitting cover. This vessel is three-fourths filled with a solution of carbolate of soda. Live steam is then ejected into the vessel to bring the fluid to the boiling point, and the injection of steam is continued until by its condensation the vessel becomes filled with fluid. The wood is then allowed to remain in the hot liquid some hours, when the fluid is drawn off and the wood washed off with a dry steam jet.

(*d*) Paraffin is dissolved in petroleum, ether, kerosene, or other convenient substance, and the wood to be preserved is steeped in this fluid, the wood being as dry as possible before being put in the fluid. After the timber has become thoroughly saturated it is heated in a large retort provided with a condensing arrangement whereby the volatile solvent is expelled and condensed for use over again, while the solid paraffin is left in the pores of the timber.

(*e*) The wood is impregnated with a solution of chloride of zinc or some other soluble antiseptic mineral salt; then the outer layers of the wood are dried by heated air currents, and finally saturated with hot creosote oil, which prevents the soluble antiseptic being washed out.

(*f*) Dissolve 1 lb. of arsenious acid in
4 gallons of water, and add
1 lb. of carbonate of soda.

Stir this mixture until the soda has dissolved. Separately dissolve 16 lbs. of sulphate of copper in 16 gallons of water. Mix these two solutions together and place them in a wooden or lead-lined vat. In this bath steep the timber and heat the fluid to boiling point by the injection of steam. A few hours' steeping is required when the fluid is heated, but if not the wood requires two or three days. For wood already *in situ* this fluid is also applicable by laying it on with a brush several times, allowing each application to dry before giving the next; if used hot they are more efficacious.

Preservative compounds to be applied with a brush to the surface of wooden structures, posts, lintels, door-jambs, garden rails, &c., are very numerous. The following selection represents the most important :—

1. Grind up sub-sulphate of iron—the refuse of the copperas pans—with any common oil, and then with coal tar oil in which a little pitch has been dissolved. This compound is flexible and waterproof.

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2. Apply coal tar and sand it over.

3. Boil 1 part (by weight) of sulphate of zinc (white copperas) with 4 parts of coal tar by measure (or 40 ozs. of the zinc sulphate per gallon of tar) and lay this on top.

4. Dissolve 1 oz. of corrosive sublimate to 1 gallon of hot water and lay this on the woodwork top; this will prevent ravages from ants and other insects.

5. Dissolve 8 ozs. of sulphate of copper in 1 gallon of hot water and apply this to the wood while hot.

6. Dissolve 8 ozs. of sulphate of copper, 8 ozs. of sulphate of iron in 1½ gallons of water, and apply as before.

7. To prevent wet-rot, apply paraffin oil or naphtha in which a very little resin has been dissolved.

8. Dissolve 16 ozs. of sulphate of copper in 1 gallon of boiling water, and then add 20 ozs. (by weight) of common sulphuric acid which has been previously mixed with 6 gallons of water. Apply the fluid hot.

9. To destroy worms in wood, apply a literal soaking of benzine (cold, of course). Do not have a light near at hand, as this fluid is very inflammable.

10. To prevent worms in wood, add some sulphur to nitric acid; distil to dryness and expose the distillate to the air until it dissolves, and then apply this to the wood by means of a brush.

11. To destroy worms already present in panels, mouldings, &c., saturate the wood with a strong solution of corrosive sublimate, and afterwards sponge or brush over a little weak liquid ammonia to restore the colour to the wood, and next a weak solution of hydrochloric acid. Stop up the holes with gum and gelatine, and afterwards varnish with a spirit varnish.

Waterproof Paint for Wood.

Ingredients:—
2 gallons of linseed oil.
11 ozs. resin.
11 ozs. litharge.
1½ ozs. red lead.
1½ ozs. umber.
8 ozs. sulphate of zinc.
12 ozs. potassic hydrate.
12 ozs. alum dissolved in 4 gallons of water.

This mixture forms the vehicle. It is prepared by boiling the oil with the resin, litharge, red lead, and umber until a homogeneous compound is produced, then adding gradually the sulphate of zinc, solution of potassic hydrate, and the alum water, stirring the whole well.

For the ground colour, mix
10 lbs. of chalk,
2 lbs. zinc white, with
3 quarts of water in which about
1½ ozs. of alum have been previously dissolved, and mix with them a solution of 1½ lbs. of glue in ½ gallon of water.

For use mix this ground paint with 4 lbs. to 5 lbs. of the vehicle and dilute with petroleum.

Another waterproofing compound is prepared by melting ¼ lb. of resin with 6 gallons of fish oil and 1 lb. of melted sulphur; colour the compound with yellow or red ochre, which is best rubbed up with a little linseed oil previously to mixing with the vehicle; give several coats of the compound laid on top. This compound is suited for stone, brick, and as well as for wood.

The plan of charring the ends of posts or of burying them in a bed of charcoal or lime is one generally adopted for fencing-posts. It is more or less preventive of rot, while the charcoal or lime prevents moisture reaching the solid wood, but as charcoal is a ready absorber of gases, incipient rotting eventually sets in. One of the best methods of preventing fencing-posts, gate-posts, and similar woodwork from rotting is the following:—

Bore one or more holes in the centre of the post—the whole length, if desired—and fill the hole with coal-tar and close up with a wedge, well driven home, which will give pressure to force the antiseptic coal-tar into the inner heart-pores of the wood, and thus preserve them internally from moist and dry rot. The outside surfaces of the posts should be coated with a resinous varnish.

Wood exposed to the air should not be dressed with coal-tar, but Stockholm tar or resinous varnish, the former will rot the fibres when exposed to sun and air. Mark the posts at 6 in. or 8 in. above the depth they are to be placed in the earth, and bore the hole up to the mark. Then fill in with boiling coal-tar, plug up the hole, and the base of the post will outlast the upper part. The writer has also had occasion to stand posts under floor joists as a support, when, by making a clay-puddled hole and pouring into it a gallon of boiling coal-tar as a bed for the post to stand in, it would never decay.

Wood used in mines may be preserved by the following method. An iron basin ½ in. thick, about 6 ft. deep and 4 ft. diameter is sunk in the ground rather more than half its depth. By the side and with its rim below the bottom of the first basin is a second, not quite half its size. A third basin, about midway between the other two in size, stands with its lower edge rather higher than the upper rim of the first basin. This first one is provided with a cover, half of which is screwed on, the other half may be opened or shut close. Above the bottom it has a sieve bottom of wire gauze, and at the bottom a discharge cock. The operation is as follows:—The pieces of wood to be impregnated are cut to the suitable lengths required for door posts, lintels, piles, &c., and placed perpendicularly as closely as possible in the first basin, the cover of which is then closed. It is not necessary that the cover should be airtight. Meanwhile, the third basin has been filled with creosote soda lye, either directly or out of the second basin, by the use of the hand pump. The lye is then admitted into the basin until it is about ¾ full, and then steam is conveyed directly through the pipe mentioned before to the lye. The fluid gradually begins to boil, while it is increased by the condensation water of the steam which pours in, and at last begins to flow away through the pipe which passes over the edge of the second basin; the steam is then turned off, and the wood may be left to boil for some time in the lye. When at last the lye has been discharged and the wood been acted upon by the direct steam, the cover of the basin is opened and the impregnated wood removed. Although wood treated in this way is penetrated with the impregnating fluid only to the depth of ¼ in. to ¾ in., it has been found perfectly unimpaired after five years in districts where wood not so treated rots and becomes unfit for use after nine to twelve months.

BOOKS RECEIVED.

SIENA: ITS ARCHITECTURE AND ART. By Gilbert Hastings. (De la More Press.)

LIGHTING BY ACETYLENE. By Frederick Dye. (E. & F. N. Spon.)

Correspondence.

NEWTON HALL.

SIR,—In your paper of the 5th inst., you have a Note on the subject of Newton Hall, Fetter-lane, in which you remark that it "will shortly give way to new buildings to be erected for the Royal Scottish Corporation" after my designs. You will be glad to know that this is not the case. The keynote of my design is to retain Newton Hall, utilising it for our Pensioner's Chapel, and connecting it with the new buildings which it is proposed to erect with a frontage and goods entrance to Fetter-lane. We only await the approval of the City authorities to some deviations of Fleur de Lis-court, which form an essential feature of my scheme. I should be sorry, indeed, to remove the old Hall, which, as you have pointed out, possesses historic interest, and which, if my design is carried out, will be brought into some prominence, instead of being buried as it now is.

J. MACVICAR ANDERSON.

ANCIENT LIGHTS.

SIR,—I have read with much interest the paper on "Ancient Lights" by Mr. Chatfeild Clarke, printed in your last issue, and it tends to confirm my opinion that the existing law is bad, and very injurious to commercial interests in large towns by the way in which it hampers the erection of new buildings and the extension of old ones. The recommendations of the Joint Committee of the Royal Institute of British Architects and the Surveyor's Institution appear to be good, and would work fairly for all parties; but would it not be better to pass a short Act rescinding the present law and ordering that no windows or other lights in buildings erected after a given date should acquire any right of light at all? Of course, existing ancient lights would have to retain their rights, but it would prevent any new rights being acquired.

The passing of the Act of 1832 seems to me to have been an unwarranted interference with the rights of the owner, who should be allowed to do as he likes on his own land; if he chooses to put out windows close to his own boundary he does it with his eyes open, knowing that the adjacent owner may at any time build up to them.

Mr. Chatfeild Clarke states in his paper that a clause is inserted in the leases of the Crown Estates taking away from the lessees all right of light over adjacent Crown lands, and that this has worked admirably; if so, why not extend this all over the country by law?

It is absurd having laws like the existing one, and our cumbrous and expensive method of land conveyance which hamper the country in competing with a new land like the United States (no right of light can be acquired there), and all they do is to provide fees for lawyers and architects too, who would be much better employed in work more useful to their country.

H. GARNHAM WATKINS.

Nottingham.

THE MOSAIC PANEL, HORNIMAN MUSEUM.

SIR,—I have but recently been able to inspect this work *in situ*, as every one interested in pictorial mosaic applied to exterior walls should do, and compare the effect with the design as published, to judge of the strength or weakness of the colour scheme, and whether the introduction of the architectural background detracts from the clearness of the figures representing the Arts and Virtues. There may be some occult reason for cutting up the pilasters of the pavilions with reeds and twists, and for the thin architraves and cornices over them, which is not apparent to the ordinary mind. But what concerned me much was the denudation of surface, where a large patch of backing with the "keys" revealed seemed to indicate that a portion of the work had fallen away from the wall and was under repair, *i.e.*, if I am right in supposing the whole subject had been completed. If there is a tendency of any particular putty to force out the surface, or any accident of weather likely to affect the stability of new mosaic, one would be glad of some hints from practical workers as to this case; for it cannot, I think, be urged as an objection to the material that it is very liable to failure, though it is stated that the weight of tesseræ may "*drag in* the putty"—here it looks as if it had dragged it *out*. It is rather serious, if not explained as an exceptional case.

A.R.I.B.A.

The Student's Column.

PART II.—DRAINAGE.

CHAPTER 13.—THE CONSTRUCTION OF ACCESS CHAMBERS.

ACCESS chambers or manholes are of various kinds. Their primary purpose is to facilitate the inspection, cleansing, and periodical testing of the drains. If the chambers are placed in suitable positions, every main and branch drain can be cleared by means of drain-rods, without having to open the ground or cut a single pipe. This is a great advantage, particularly in cases where the gradients are insufficient to render the drains self-cleansing. Manholes containing intercepting traps are usually known as intercepting chambers, and those receiving branch drains as junction chambers. A third class includes manholes placed in drains at changes of direction or of gradient. Access chambers ought also to be provided at each end of a drain passing under a building. In long outfall drains manholes and lampholes may be placed alternately at intervals of about 80 yards.

The Model By-laws are strangely silent as regards the construction of access chambers. The only provisions they contain relate to the nature of the cover. The London by-laws, however, require every means of access to drains "to be constructed so as to be watertight up to the level of the adjoining ground surface or roadway, and to be fitted with a suitable manhole cover, and, if placed within a building, to be fitted with an airtight cover."

The length and breadth of the chamber must be regulated by the depth, the presence or absence of side branches, and (in the upper part) by the size of the cover. If the bottom is formed with open channels, the chamber ought to be as small as possible consistent with the insertion of clearing rods (usually made in lengths of 3 ft.) into the several drains; large volumes of air in the manholes render the ventilation of the drains more difficult. As drain-rods are flexible, they can be used in chambers less than 3 ft. in length or breadth, especially if "chutes" are fixed to form the ends of the drains. If there are no side branches, such a chamber may be about 2 ft. long and 1 ft. 6 in. wide inside. Chambers between 1 ft. 6 in. and 2 ft. 6 in. in depth must be

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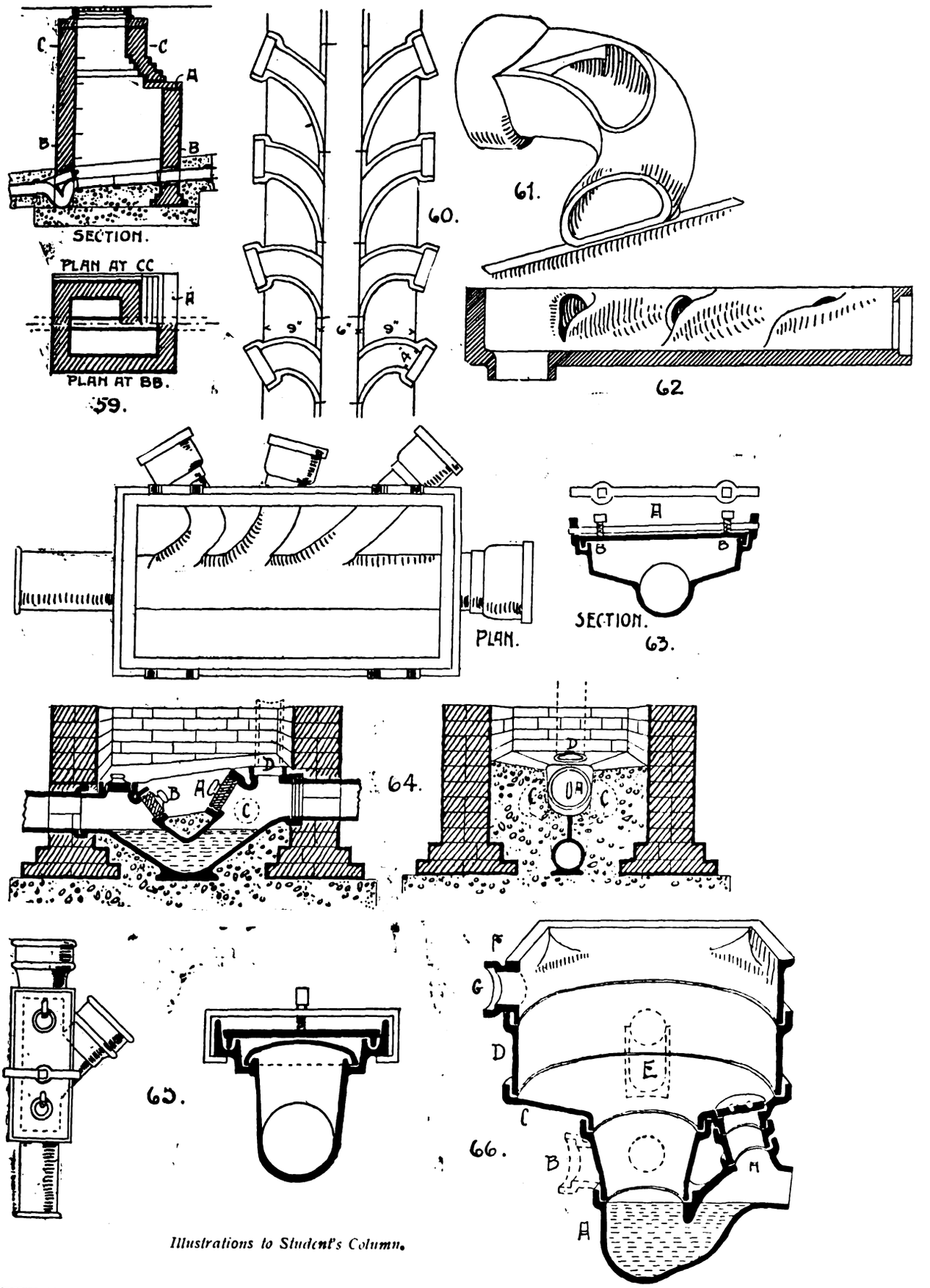

Illustrations to Student's Column.

increased in size to about 2 ft. 6 in. by 2 ft., or, if there are side branches, to 2 ft. 6 in. square. Deeper chambers must be larger, but need not exceed 3 ft. 6 in. by 2 ft. 6 in., unless the number of side branches necessitates a greater length. Covers of almost any dimensions are now made up to 3 ft. by 2 ft., and even larger. In the case of manholes more than 6 ft. deep large covers are unnecessary; all that is required is a cover with an opening large enough for a man to get through, say from 1 ft. 6 in. to 2 ft. square, or 1 ft. 6 in. wide and 1 ft. 9 in. or 2 ft. long.

The general construction of a deep manhole is shown in fig. 59. The foundation is of concrete, and the walls of 9-in. brickwork in Portland cement mortar (1 cement to 1 sand), all the joints well flushed and pointed, and grouted every course with neat cement. The bricks may be of any hard and sound variety, but for good work blue Staffordshire bricks, or salt-glazed or white enamelled bricks, may be used. Every one who has had any experience knows the difficulty of getting the ordinary workman to make 9-in. brickwork absolutely watertight, and it is sometimes necessary to rake out the joints and repoint them, or to render the brickwork with cement mortar. Sometimes the walls are entirely surrounded with concrete not less than 6 in. thick. The upper part of a deep manhole must be gathered over by means of a flagstone, as shown at A, or a brick arch, and may be further contracted above this to the size of the cover by means of oversailing courses. At one time it was a common practice to finish manholes with flagstone covers about a foot below the finished surface of the ground, but as this method of construction renders access more difficult, it cannot be recommended.

Manhole bottoms are sometimes constructed entirely of concrete with channels for the main and branch drains formed in the material, the whole covered with cement mortar (1 to 1) and trowelled to a smooth surface. It is much better, however, to use channels of the same materials as the drains. The simplest form is semicircular in section, the main channel

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having curved junctions to receive the side channels from branch drains. Fig. 60 shows a manhole bottom with a number of branches entering the manhole at various angles, but so arranged that the flow in every branch is turned by the channel in the direction of the main flow. The spaces between the channels must be filled with concrete, which must be formed with quick slopes from the walls to the channels, and be trowelled to a smooth surface. The construction is often simplified by placing the side channels above the main channel; this arrangement is advantageous in preventing the sewage in the main from flowing into the branches, but may cause a considerable amount of splashing unless the side channels are specially designed. To prevent splashing, the outer edge of each side channel may be curved over so that the section becomes approximately three-fourths of a circle. A more elaborate type is Jones & Sykes's patent channel-bend shown in fig. 61, the branch-piece taking the form of a pipe with a hole in the top to admit a drain-plug or drain-rods, and with the discharging end curved slightly downwards so as to deflect the sewage more completely into the main channel. Manhole channels in connexion with stoneware drains are, for ordinary work, usually made of stoneware, but for the best work white enamelled ware is often preferred.

Manhole bottoms are now made in single blocks of stoneware or enamelled ware with main and branch channels of the required size and number. They are heavy and costly, but the absence of joints is a distinct advantage. An example is given in fig. 62. It is made by Twyfords in sizes up to 7 ft. by 3 ft., and for pipes up to 9 in. in diameter.

Iron channels, either coated with Angus Smith's solution or enamelled, are made for use with iron drain-pipes. Price's patent "Imperial" cast-iron manhole bottoms are a new departure. Each bottom consists of a single casting 1 ft. 6 in. wide, the length varying from 1 ft. 6 in. to 6 ft., according to the number of side branches. Fig. 63 is a plan of a bottom with three branches on one side. Special air-tight covers are also made to fit immediately over the bottom, one of these being shown at A; the cover is fixed by malleable iron bars and gun-metal screws, and the grooves at B B are made airtight with Russian tallow or other composition. The air-inlet to the drain is carried to the space between the cover and the bottom; this arrangement reduces the volume of air to be moved in ventilating the drain. These bottoms are too narrow to allow a workman to insert rods into the branch-drains, but more space can be provided in the manhole by forming offsets 4½ in. wide in the brick sides at or near the level of the crowns of the branch-pipes. The largest bottom has seven branches on each side.

When open channels are used, the flow of the sewage can be observed after simply removing the manhole cover, and the drains can easily be tested and cleared. The large volume of air in contact with the sewage is, however, a disadvantage, as it renders ventilation more difficult, and the splashing of sewage on to the "benchings" may give rise to a nuisance. For these reasons, pipes or traps with access covers are now sometimes used instead of channels. Fig. 64 is a section of an intercepting chamber of this kind, fitted with Sykes's patent interceptor. To inspect the inlet drain, the cap A must be removed, and the outlet drain can be inspected by removing the cap B. Sockets for branch drains can be provided in the interceptor as shown at C C, and a socket for the fresh-air inlet is formed at D. Stoneware access-pipes suitable for manholes have already been illustrated.

A cast-iron access-pipe, known as Jones's patent double-seal airtight inspection chamber, is shown in plan and section in fig. 65. The example illustrated has one branch socket, but the chambers can be made with any number of branches up to four. The upper seal formed by the cover and the grooves in the frame can be made airtight with Russian tallow or other composition, while the groove of the lower seal is filled with water and is kept charged by the condensed moisture on the arched plate running down into the groove. These access-pipes are, of course, adapted for iron drains carried on supports in the basements of buildings, as well as for use in manholes.

Small access-chambers are sometimes constructed entirely of stoneware. Fig. 66 gives some details of the "Accomo" intercepting-chamber, which is of this class. The trap A is made with 4-in. or 6-in. outlet, and above this is a "middle piece," which can be made with inlet sockets as shown by the dotted lines. The chamber floor C is 2 ft. in diameter and 6 in. high, and has a sloping bottom; above this a "raising piece" D is shown, and this also can be fitted with inlet sockets from which channels E lead to the central outlet in the chamber bottom. The top piece F is converted to a square shape, and has an air inlet socket at G. An inspection arm can be fitted to the trap as shown at H, finished with a socket and cap in the chamber bottom.

Steps ought to be built into the walls of deep manholes; they are generally of cast-iron of horseshoe shape, and spaced at vertical intervals of about 1 ft., or four courses of brickwork. They are supplied plain, coated, or galvanised.

GENERAL BUILDING NEWS.

A MEMORIAL CHURCH, THORPE, NORWICH.—On Easter Monday the new Primitive Methodist church at Norwich, which will perpetuate the memory of the late Mr. Jonathan Scott, was dedicated to the uses of public worship. The building is Gothic in style, and is built throughout of red brick, with Ancaster stone for the front and Costessey ware for the side dressings. The main entry is by way of a vestibule fronted by three granite columns and surmounted by three windows. On either side of the principal doorway is a fireproof staircase giving access to the gallery, a convenience which is also repeated at the southern end, so that there is a gallery exit at all four corners of the building. At the southern end also there are vestries, cloakroom, and lavatories, and a young people's institute. The seating accommodation is 650 for the church and 120 for the institute. The floor has been given a fall of 9 in. in the direction of the pulpit. The rostrum, the galleries, and the benches are all of oak. At the south end is an apse, the arch of which rests on granite columns, as do the side galleries. The builders were Messrs. Scarles Bros.; Messrs. Boyle carried out the ventilation work; and the electric lighting and the heating apparatus have been installed by Messrs. Payne. The cost of the site was 1,000*l.*, and the tender for the work at present completed was let for 4,300*l.* The architect was Mr. A. F. Scott.

PROPOSED CHURCH, KIRKCALDY.—It is proposed to erect on the tennis grounds at Victoria-road, Kirkcaldy, a new church for the U.F. congregation. The building is in the Renaissance style, and will contain 750 sittings and a gallery. The main entrance is flanked by two inner vestibules fitted as cloak-rooms, the galleries being reached by stairs leading from the corners of the main entrance. There will be a chancel at the rear of the pulpit in which provision is made for an organ. The lighting throughout will be by electricity. Under the church will be a set of halls, the larger hall having accommodation for 350, and the smaller hall being seated for 80. Mr. William Dow, Kirkcaldy, is architect for the work.

CHURCH OF ST. COLUMBA, BRADFORD.—On the 1st. inst. the Bishop of Ripon consecrated the new Church of St. Columba, St. Margaret's-road, Horton, Bradford, which has been built by Lady Powell at a cost of about 10,000*l.* The architects of the building were Messrs. T. H. and F. Healey. Within is a main nave, with north and south aisles, and quasi-transepts, with chancel flanked by a chapel and the organ-chamber. The church is not correctly oriented owing to the difficulties of the site. Space is found for the parish-rooms beneath the building owing to the drop in the ground. The nave is of six bays, with pillars alternately octagonal and circular. The clearstory is continuous throughout the nave and chancel, and is lighted by coupled lancets, and the roof is of unstained wood. The chancel is of three bays, subdivided into cusped arches, with slender octagonal shafts, the tympanum of the main arches bearing sculptured medallions, in high relief, of angels—the work of Mr. Hammond, of Messrs. Farmer & Brindley, London. The building will seat 700 persons, the pews being pitch-pine, whilst the choir-stalls, altar rails, and pulpit are of oak. The font is of stone and octagonal, supported with angle shafts. The organ is being built by Messrs. Harrison & Harrison, of Durham, and the altar frontal has been worked by the Ripon Diocesan Needlework Guild. The principal contractors for the building were:—Masons' work, Mr. Wm. Farnish, and joiners', Messrs. J. Taylor & Sons. The stone is from the Ringby Collieries, Halifax.

ST. PATRICK'S NEW CATHOLIC CHURCH, GORTIN, CO. TYRONE.—The plans of this building were prepared by the architect, Mr. Toye, of Derry, and the structure is being erected by Mr. D. Funston, Ballyshannon. The church is now finished inside. The high altar and altar rail, all in oak and walnut, were supplied by Messrs. T. R. Scott & Co., Dublin. The seats are being built by Mr. D. M'Caffrey, Lifford and Strabane.

ST. MARTIN'S EPISCOPAL CHURCH, POLMADIE, RENFREW.—This church, built in 1887 as a mission from St. Ninian's, Pollokshaws-road, is to be enlarged. This will be done by lengthening the nave and by the addition of a south aisle and transept next Dixon-road. A hall, with vestries and other rooms, will also be erected from the designs of Mr. H. D. Walton, architect, Glasgow.

CATHOLIC CHURCH, ACTON.—Cardinal Vaughan, on the 5th inst, laid the foundation-stone of a new Roman Catholic church, dedicated to Our Lady of Lourdes, in the Uxbridge-road, Acton. The church is to cost 5,000*l.*, and will be completed in July, the architect being Mr. Goldie.

HALL, ENZIE U.F. CHURCH, ABERDEEN.—On the 28th ult., the hall erected by the congregation of the Enzie United Free Church was opened, and dedicated by Principal Salmond. The frontage of the hall, which is to Main-street, is Gothic in style, the walls being of rock-faced ashlar. The building is surmounted by a belfry and bell, with a three-light window in the gable underneath. On the left of the vestibule is a small cloak-room, and the gallery stairway to the right, with two doors opening into the aisles, which run up both sides of the main building. The hall is seated for 300 and is 51 ft. by 31 ft. The two stained glass windows in the north gable on either side of the pulpit, are the work of Mr. Edward Copland, glass-stainer, Aberdeen. A 13 ft. by 20 ft. side hall, entered by a passage on the left, is to be used for smaller meetings; and adjoining this room there is a vestry, with lavatory. The contractors were:—Builder, Mr. Legge, Fochabers; joiners, Messrs. Hendry Bros., Portgordon; plasterer, Mr. R. Reid, Portgordon; slater, Mr. Barclay, Buckie; painter and glazier, Mr. Macdonald, Portsoy; and plumber, Mr. Campbell, Buckie. The architects were Messrs. D. and J. R. Macmillan, Aberdeen.

NEW INFANTRY BARRACKS AT PEMBROKE DOCK.—The new infantry barracks at Pembroke Dock are intended for the accommodation of the non-commissioned officers and men, and will, when complete, form two H-shaped blocks, the sides of the H in all cases being fitted up as sleeping quarters, each room of which will contain accommodation for twelve men. The connecting piece across the middle of each block will form dining-rooms and kitchens. The buildings will all have two floors, and a verandah will be constructed around them at the level of the upper floor. In addition to these blocks, a commanding officer's residence, officers' quarters, officers' mess, stables, gymnasium, &c., are to be built. The erection of the entire group is to be completed by December 31, 1904. It is to be carried out in three sections. The first of these, which includes one block of the men's quarters and a portion of the other, was entrusted to Mr. D. Davies, Cardiff, the contract price being upwards of 30,000*l.*, and it is now being proceeded with. The plans, particulars of quantities, and all other necessary information to enable competing builders to prepare estimates of cost for the second section have now been completed, and tenders for its erection will be invited shortly. The commanding officer's residence, officers' quarters, and officers' mess and stables are included in this section, of which the estimated cost is said to be 88,000*l.* The gymnasium and some other buildings, of which the plans are not yet approved, will form the third section. All the buildings will be of brick. Other military buildings to be carried out at Pembroke during the financial year include the construction of fortifications and artillery ranges, for which a sum of 4,800*l.* is proposed to be voted.

NURSES' HOME, ASTON, BIRMINGHAM.—The new nurses' home which has been erected at Gravelly Hill in connexion with the Aston Union Workhouse was opened on the 3rd inst. The building has been built from plans prepared by Messrs. C. Whitwell & Son, of Birmingham, by Mr. T. Johnson, builder, at a cost of 9,900*l.* It occupies a position facing Feltham-road, to the south of the Infirmary buildings. Accommodation is provided for upwards of forty nurses. On the ground floor the eastern end is given over to the rooms that will be occupied by the medical officer and steward, and to the west of the entrance-hall there is the superintendent nurse's room, and the rooms of the other nurses and probationers, with the usual rooms for meals, kitchens, &c. On the first floor there is the sleeping accommodation for the medical officer and steward, and bedrooms for forty-two nurses are on the top floor. The heating is by hot-water radiators.

BUILDING IN YORK.—The building inspector for the Corporation reports that on the west side of the city the building trade has in 1901 been brisk, though, compared with 1900, there is a decrease in the number of houses completed and in progress. This decrease has been somewhat balanced by the number of extensive additions to existing buildings. The greater number of houses erected are in the South Bank and Nunthorpe estates, Poppleton-road, Lindley-street, and Murray-street. On the east side of the city 218 houses, mostly of the small and middle class, have been built on the Hull-road, Lawrence-street, Church Park, Huntington-road, and Burton-lane estates. Extensive new public buildings and additions and alterations to existing premises are in progress.

BUSINESS PREMISES, PRINCES-STREET, EDINBURGH.—An addition has just been made to the business premises of Princes-street by the erection of the building at No. 136, which is to be occupied by Messrs. Macvittie, Guest, & Co., Ltd., bakers and confectioners, as the headquarters of their city

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business. Designed by Messrs. Hamilton, Paterson, & Rhind, architects, the building has a frontage of 30 ft. to Princes-street, and is 80 ft. in height, divided into four principal floors. The walls are of sandstone ashlar, except the whole of the shop front, which has been faced with polished red Correnie granite.

URBAN DISTRICT COUNCIL OFFICES, HEATON NORRIS, LANCASHIRE.—The new offices of the Heaton Norris District Council are situate at the corner of Thornfield-road and Green-lane. The new offices are of stone construction, having Yorkshire parpoint facings with Alderley stone dressings, the roof being covered with Tilberthwaite green slates. This main front has a predominating projecting central portion flanked by two wings. Approached by a short flight of steps flanked with sweeping balustrades on either side is the principal entrance. This leads to a vestibule decorated in faience, tiles, and mosaics. A few steps from the vestibule give access to the ground-floor corridor, the main staircase to the first floor being central, and immediately facing the principal entrance. Entered from the main corridor on the ground floor are the administrative offices. Those of the collector and surveyor are on either side of the principal entrance. Communicating respectively with these, as well as directly from the corridor, are the clerk's general and the surveyor's general offices. The clerk's private office opens off the corridor and communicates also with the clerk's general. Also on the ground floor in the rear of the building are provided an overseer's and sanitary inspector's offices, as well as additional rooms available as spare offices, waiting-rooms, &c. At the end of the two passages on either side of the principal stairs a telephone-room and ante to the back entrance are respectively provided. The first floor is reached by means of stairs (18 ft. wide) of oak and pitch pine. On the first floor is a corridor (8 ft. wide), and directly approached from this is the Council Chamber occupying the entire central part of the front of the building. It is a room nearly 40 ft. long by 20 ft. wide and 16 ft. in height. Opening off the Council Chamber, as well as directly from the corridor, are the Council retiring-room and committee-room. The former occupies the entire left wing of the building from front to back. This room is divisible into two, when desirable, by a patent folding screen. Its dimensions are:—Length, 41 ft.; width, 21 ft.; and height, 13 ft. There are also two waiting-rooms, a stationery store, lavatories, &c., on this level. The basement is approached under the main stairs on the ground floor; this is devoted to heating and other purposes. The architects are Messrs. Woodhouse & Willoughby, who won the first premium in the limited competition held some five years ago, amongst nine competitors. The general contractors were Messrs. A. R. Bullivant & Sons, of Manchester and Moston. Mr. Samuel Mellor was clerk of works. The following tradesmen have been engaged on the work, apart from the general contractors, viz.:—Heating and ventilation, Mr. E. Hatton, Manchester; mosaic flooring, Messrs. Patteson, Manchester; art metal work, Mr. A. Standring, Manchester; sanitary fittings, Messrs. Shanks, Manchester; ironmongery, locks, &c., Messrs. Marley Bros., Birmingham; wood block floors, Mr. E. P. Garth, Manchester; grates and mantles, Messrs. C. W. Williams & Co., Manchester; stained glass windows, Mr. S. H. Leyland, Weaste; gas fittings, Messrs. Baxendale, Manchester; patent folding partitions, Messrs. Peace and Norquoy, Manchester; fireproof door to strong room, Messrs. John Port & Co., Ancoats, Manchester; carving, Mr. J. J. Millson, Manchester. The silver-gilt presentation key has been supplied by Messrs. Marley Bros., Birmingham. A brass tablet has been erected in commemoration of the opening of the offices. It is about 3 ft. long and 2 ft. in width. The tablet consists entirely of brass mounted on highly polished black marble, the work of Messrs. Thomas Webb & Co., Stockport.

PUBLIC OFFICES, BIRKENHEAD.—At Birkenhead, on the 3rd inst., Mr. John Evans, Chairman of the Board of Guardians, laid the foundation-stone of the new Union Offices in the course of erection on a plot of land off Argyle-street. The new offices have a frontage of 59 ft. to Argyle-street, 176 ft. to Conway-street, and 100 ft. to Oliver-street. The building, which is three-story, will be constructed in Ruabon red brick with terra-cotta dressings with Crowdundale stone. The angle at the corner of Argyle-street and Conway-street is octagonal, and at the head of the building at this point is an ornamented turret with a dome. The main entrance is from Argyle-street, and the entrance for relief applicants in Oliver-street. The main porch is recessed, with a moulded arch of terra-cotta and red stone intermixed. Immediately inside the main entrance is the main staircase, at either side of which will be granite columns and arches in Crowdundale stone. Over the staircase will be a dome, through which light will be obtained for the main entrance hall. The departments in the basement are utilised principally for storing purposes. On the ground floor are the general offices, clerks' offices, marriage-room, conference-offices, relieving-rooms, doctors'-rooms, dispensary, and a waiting-hall 56 ft. by 46 ft. The board-room, which is 52 ft. by 36 ft., is on the first floor, and on the same floor are the general committee-room, assessment-room, extra committee-room, consulting-rooms, lavatories, and cloakrooms; a corridor gives access to each of these rooms. On the second floor are the valuer's private office, the vaccination office, book store, and extra committee-rooms, while at the rear of this floor is the caretaker's residence. The third floor is utilised for domestic purposes. The building is lighted throughout by electricity. The architect for the building was Mr. Edmund Kirby, the contractor Mr. W. H. Forde, and the clerk of works Mr. W. Hughes.

NEW BUILDINGS IN ABERDEEN.—At a meeting of the Plans Committee of Aberdeen Town Council on the 3rd inst., seventeen sets of plans of buildings were submitted, the aggregate value of the property represented being 17,400*l.* The plans include those of small additions to Morningfield Hospital for Incurables and to the Educational Trust's Schools in King-street; a new business building for the Seaton Brick and Tile Company, on the site of their present sheds in Market-street; and a number of new dwelling-houses in different parts of the city.

CHURCH HALL, READING.—A new church hall has been erected at Reading. The hall is built of red brick, and is lighted by three large windows. The flooring is of wood blocks. The architect is Mr. W. Jane.

CORONER'S COURT, BATTERSEA.—On the 5th inst. the Mayor of Battersea performed the opening ceremony in connexion with a new coroner's court and mortuary which the Borough Council has erected at Sheepcote-lane, Latchmere-road. The new buildings have a frontage of 55 ft. and an average depth of 82 ft. On the ground floor are the coroner's room, doctor's and attendants' room, post-mortem room, mortuaries for infectious and non-infectious cases, and storerooms. The first floor comprises an open-timbered roof court and witnesses' rooms. The buildings have been erected under the supervision of, and from designs prepared by, Mr. J. T. Pilditch, the Borough Surveyor. The approximate cost of the buildings has been about 5,000*l.*

CLOCK TOWER, SALTBURN-BY-THE-SEA.—A new memorial clock-tower has been erected at Saltburn-on-the-Sea, as a memorial to the Rev. B. Irvin, the vicar. The tower is from the design of Messrs. Clark & Moscrop, architects, of Darlington, and the clock and chimes are by Messrs. Potts & Son, of Leeds. The builder is Mr. R. Harland, of Whitby.

HOSPITAL EXTENSION, BURNLEY, LANCASHIRE.—A new operating theatre at the Burnley Victoria Hospital was opened on the 20th ult. The new theatre has cost 1,000*l.* The work has been carried out by Mr. Quarmby, architect and surveyor, Burnley.

PROPOSED NEW THEATRE, BURTON-ON-TRENT.—It is proposed to erect a new theatre at Burton. A site has been obtained in a central position, the main frontage being in Cross-street, with side entrances in Duke-street and the stage entrance in Milton-street. The site covers an area of 1,400 sq. yds., and on this it is proposed to erect a theatre capable of accommodating 1,200. The pit and stalls are to provide for half that number, with a dress-circle and gallery accommodating 300 each. The stage is to measure 36 ft. by 60 ft., the proscenium opening being 30 ft. across. The building is expected to cost about 15,000*l.* Mr. E. Forshaw is the architect.

BUSINESS PREMISES, LIVERPOOL.—Messrs. Jacobs, the Liverpool firm of tailors and outfitters, have just opened new premises, erected at the corner of Ranelagh-street and Lime-street. The site has a frontage to Ranelagh-street of about 65 ft., running in depth to Mitchell-place, Back Lime-street, for about 80 ft. The new building consists of six floors (including basement), finishing on the roof with a gilded tower and turret, for illumination purposes, rising to a height of 120 ft from the pavement. The work has been carried out by Messrs. H. E. B. Greene & Co., the contractors, under the superintendence of Messrs. W. Hesketh & Co., the architects. The electric lighting is being carried out by the Liverpool Corporation under the superintendence of their Deputy Electrical Engineer, Mr. Alfred Clough.

STAINED GLASS AND DECORATION.

QUEEN VICTORIA MEMORIAL WINDOW, ST. BARTHOLOMEW'S CHURCH, BRISTOL.—On the 5th inst. the stained-glass window placed in St. Bartholomew's Church, Bristol, as a memorial to the late Queen Victoria, was unveiled and dedicated by Canon Everingham. The window consists of five lights and tracery. The lights are divided into three separate groups. The principal subject, which is contained in the three centre lights, is "The Ascension." Beneath the figure of our Lord are grouped in various attitudes the eleven Apostles, and on either side are angels kneeling in adoration. In the left-hand light the subject is "The Nativity." The right-hand light depicts "The Resurrection." In the tracery of the window above are emblems of the four Evangelists, and two large figures of kneeling angels, bearing scrolls. The work was carried out by Messrs. J. Bell & Sons, of Bristol.

WINDOW, PARISH CHURCH, RAMSGATE.—On the 5th inst. there was unveiled at the parish church of St. Laurence, Ramsgate, a stained-glass east window erected as a memorial of Queen Victoria, who, as a girl, worshipped there. The window, which is from a design by Mr. A. O. Hemming, depicts in its central panels the Resurrection, the subjects treated in the lower lights being scenes in the early history of the Church in Britain, including the landing of St. Augustine in A.D. 597, and the baptism of King Ethelbert at St. Martin's, Canterbury.

WINDOW, LEEK PARISH CHURCH, STAFFORDSHIRE.—A new painted glass window has been put into the old Parish Church, Leek. The figures are all, with the exception of the four angels holding the scroll (in the tracery), designed by the late Sir E. Burne-Jones, and the exceptions were designed by the late William Morris. The window has been executed by Messrs. Morris & Co., at a cost of about 500*l.*

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. C. H. Brodie, architect, has removed his offices from 17 Southampton-street to 15 Hart-street, Bloomsbury, W.C.

VICTORIA STATUE, PORTSMOUTH.—A statue of the late Queen is to be erected near the Town Hall, as part of the Portsmouth Coronation commemoration. The sculptor is Mr. A. Drury.

OLD FONT RECOVERED.—The Rev. D. W. Duthie, rector of Caister-on-Sea, has applied to the Chancellor of Norwich for permission to place in his church an ancient font recently discovered by the rector of Mellis in a cottage garden near Eye, Suffolk. The font is of Decorated architecture, and probably fashioned in the sixteenth century. It had done duty as a big flower-pot, and weighed nearly a ton. Where it came from originally has not been discovered. Mr. Duthie proposes to remove the present small font in Caister Church to a chapel-of-ease to make way for the older one.

PEABODY BUILDINGS, HERNE HILL.—The Governors of the Peabody Donation Fund have just carried out a scheme for the housing of London workers of the poorer class. They have acquired an area twenty acres in extent at Herne Hill, and on a portion of this land, representing about eight acres altogether, they have constructed in four groups, and at a total cost of 70,000*l.*, twelve blocks of artisans' dwellings, of which three are now ready for occupation. There is room on the eight acres, it is stated, for a total of forty-eight blocks, but only the twelve in question have been erected at present. The dwellings are in Rosendale-road, Norwood-road, within two minutes' walk of Brockwell Park; each of the twelve blocks consists of nineteen tenements—three of one room each, eleven of two rooms each, and five of three rooms each—a total of forty rooms per block. A single-room tenement is available for husband and wife and one child under five years; a two-room tenement for husband, wife, and four children under twelve; and a three-room tenement for husband, wife, and six children under twelve. On this basis the twelve blocks can accommodate 1,380 persons without overcrowding; while the whole forty-eight blocks which could be put upon the eight acres (allowing a space of 60 ft. between the various groups of buildings) would lodge 5,520. Unless in exceptional circumstances no tenants are accepted whose earnings exceed 30*s.* a week, the actual average being 22*s.* Each of the two-room and three-room tenements has not only a cooking-range or kitchener, with boiler and oven, but is also supplied with a gas-stove, which may be used or not, as the tenant pleases, the gas being obtained by means of a penny-in-the-slot meter fixed against the wall. The single rooms have the cooking-range without the gas-stove, but a gas-pipe is fixed, so that the tenant may easily make his own arrangements for cooking by gas if he so desires. Every tenement, too, is provided with cupboards, meat-safe, coal-bunker, and gas-fittings. On the top floor of each block there is a laundry and drying-room. The rents charged for the new dwellings are—for one room, 2*s.* 9*d.* per week; for two rooms, 5*s.* 3*d.* per week; for three rooms, 6*s.* 6*d.* per week. But these various sums do not include the rates, which will have to be paid by the tenants themselves.

LONDON GEOLOGICAL FIELD CLASS.—The series of Saturday afternoon excursions of the London Geological Field Class, conducted by Professor H. G. Seeley, F.R.S., will commence on the 26th inst., when a visit will be paid to Erith; and the excursions will be continued on each succeeding Saturday (except on Saturdays before Whitsuntide and in Coronation week) until July 12. Further particulars can be obtained from the Hon. Gen. Sec., Mr. R. Herbert Bentley, 43, Gloucester-road, Brownswood Park, N.

EUSTON HALL, SUFFOLK.—Euston Hall, near Thetford, a seat of the Duke of Grafton, has been greatly injured by a fire that broke out in the forenoon of Saturday last. The flames were discovered in the west wing whence they spread to the south-west front. The north wing, together with the valuable collection of pictures, has been saved, but the west front, including the dinner-room, famed for its painted ceiling, and the south wing are consumed. Euston Hall, built of red brick with stone dressings, stands in a finely-planted park, extending over 1,250 acres, watered by the Thet, which is crossed by a wooden bridge that carries the road from the west. It was originally built *temp.* Charles II. for Henry, Earl of Arlington, whose daughter and sole heir, Isabella, married the first

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Duke of Grafton. Amongst the pictures are portraits of James I. and his Queen, by Jansen; Charles I. with the Marquis of Hamilton, by Van Dyck; James II. and Anne Hyde, by Lely; and Henry, first Duke of Grafton, by Kneller.

SCHOOL OF ART WOOD-CARVING.—The School of Art Wood-carving, South Kensington, has been re-opened after the usual Easter vacation, in rooms on the top floor of the new building of the Royal School of Art Needlework in Exhibition-road, and we are requested to state that some of the free studentships maintained by means of funds granted to the school by the Technical Education Board of the London County Council and by the Draper's Company are vacant. The evening class has been re-opened and will meet on three evenings a week and on Saturday afternoons. Forms of application for the free studentships and any further particulars relating to the school may be obtained from the manager.

CAPITAL AND LABOUR.

BRADFORD JOINERS' STRIKE.—The dispute in the Bradford building trade still drags on, and during the past month 300 joiners, now the only operatives holding out, received strike pay. An offer by the masters to pay 8½d. per hour, with the concession that notices of alteration of rules should expire on June 30 instead of May 1, has been rejected by the Amalgamated Society of Carpenters and Joiners by 350 votes to 70. The Mayor's proposal, however, that a Conciliation Board be formed, with a view to settling the differences and insuring future industrial peace, has been willingly agreed to.

STRIKE IN THE KIDDERMINSTER BUILDING TRADE.—A general strike has occurred among the bricklayers of the Kidderminster district owing to the employers refusing to grant an advance of 1d. an hour to the men from April 1. Some other questions have been raised, but the principal point at issue is that of wages. All the labourers are thrown out in consequence of the strike.

LEGAL.

EMPLOYERS' LIABILITY ACT: QUESTION AS TO "DEFECTIVE" FLOOR NEAR A SAW-BENCH.

AT the Brompton County Court on Monday, before Deputy Judge Clement Lloyd and a jury, George Baker, a builder's machinist, Hampstead, N.W., brought an action, under the Employers' Liability Act, against Mr. William Willett, builder, Chelsea, S.W., claiming damages in respect of personal injuries sustained, and said to have resulted from a defect in the defendant's machinery or "works and ways," or negligence on the part of the defendant or his servants.

Mr. H. J. Turrell, counsel, appeared for the plaintiff; and Mr. J. R. Atkin, counsel, defended.

Plaintiff's counsel explained that his client entered the defendant's employment in January last as a machinist. On February 4 he was cutting pieces of wood for sash-frames by means of a circular saw It appeared that close to where the man was standing there was a trap-door in the floor, and that while his left foot was upon the trap-door the latter shifted an inch or so, causing him to slip and get his left hand in contact with the saw. Subsequently, the middle finger had to be amputated, and the first and third fingers also were badly injured. Owing to the accident the plaintiff had since been unable to do any work, and would not, it was said, be able to continue work as a machinist in the future.

The plaintiff bore out his counsel's opening statement. He added that prior to the date of the accident his work at the defendant's shop had been to attend to an "over-hand joiner" and a "general joiner." At the time of the accident, however, he was cutting "pocket pieces" in the sash-frames, under the foreman's directions, on a simple circular-saw bench. He complained about the "fence" on this machine not extending beyond the side of the saw, and the foreman replied, "No, it's no good; I am going to have a new one put in. Do the best you can with it at present." Subsequently to the accident he (plaintiff) went to the shop and found that the trap-door could be shifted 2⅜ in. by one's foot and as much as 8½ in. by hand.

Cross-examined: The object of the "fence" at the side and extending above the circular saw was not to protect the workman.

The foreman of the jury: It is a guide.

Mr. Atkin: That is so; the term "fence" is ambiguous, and in this instance, perhaps, a little misleading.

In answer to further questions, the plaintiff denied having admitted that the occurence was a "pure accident," or that be, and not the trap-door, slipped. It was true that in the shop there was a notice to the effect that all persons employed on the works were required to give immediate information of any negligence on the part of those in authority, or of the existence of any defect in the machinery or plant.

Re-examined: He did not know of any defect in the trap-door prior to the accident. He understood that it was no part of his duty as a machinist to inspect the floor round the machine which he was instructed to work.

Mr. H. Burrows, F.R.C.S, &c., described the man's injuries.

George W. Dixon, a foreman builder's machinist, stated that he examined the trap-door in question shortly after the accident, and found that it shifted as the plaintiff had described. Witness also maintained that the "fence" ought to have extended beyond each side of the circular saw, and that the "fence" on the machine was too short for the work in question.

Ernest Jones, a builder, gave similar evidence as to the trap-door being easily shifted.

For the defence, Arthur Moore, shop foreman to the defendants, said that the trap-door had been formed in order to facilitate the finding of nuts or small portions of the machine which might drop down. Witness knew, of course, that the trap-door would "take up," but he was not aware that it would slip when stood upon. The plaintiff had never complained to him about the trap-door. Witness went on to state that the plaintiff admitted that the occurrence was a "pure accident," and that he slipped, but the man said nothing about the trap-door slipping.

Cross-examined: The trap-door could be moved about an inch and a half without difficulty when the sawdust and chips were cleared away. It was necessary for a man working the machine to have a firm foothold.

Arthur W. Edwards, another machinist in the defendant's employment, stated that he had worked the machine in question many times, and had never known the trap-door to slip.

Edward Edwards, brother of the last witness, and also a machinist in the defendant's employment, gave similar evidence.

The jury found in favour of the plaintiff, assessing the damages at 100*l.*

His Honour gave judgment accordingly, and allowed costs, including advice on evidence, particulars, the qualifying of two witnesses, and for the preparation of a plan of the *locus in quo*.

ISLINGTON DRAINAGE CASE.

THE case of Proctor *v.* the Mayor, &c. of Islington, came before Mr. Justice Wright in the King's Bench Division on the 9th inst. It was an action by the plaintiff to recover from the defendants 54*l.* as moneys paid to the use of the defendants and at their request. It seemed that in January, 1901, the defendant Council's Sanitary Inspector served the plaintiff with notice that certain drains on the plaintiff's premises in Rotherfield-street, Islington, were defective. The plaintiff thereupon engaged a builder to do the necessary work, thereby incurring expenses to the amount of 54*l.* The plaintiff's case was that the repairs which had to be done were repairs to a sewer which it was the duty of the defendants to maintain, and that she was therefore entitled to recover the costs she had been put to in doing such work as was required by the notice. The defendants admitted, for the purpose of deciding their liability under the notice, that the work done was work upon a sewer which it was their duty to maintain. Mr. Courthope-Munroe, however, on their behalf contended that the notice served on the plaintiff was an intimation that the drainage was defective, but the Council did not order the plaintiff to do the work in question, and that, therefore, the defendants were not liable.

Mr. Justice Wright, at the conclusion of the arguments, held that the plaintiff could not recover as she had not done the work under compulsion, or at such a time as the Council themselves were bound to do the work. He accordingly dismissed the action with costs.

Mr. Oliver represented the plaintiff.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

22,090.—APPARATUS FOR THE WELL GATES OF LIFTS: *A. Johanson.*—The upper horizontal bar of the gate is affixed to a shaft having two fixed pulleys that are joined with crossed and open belts to two pulleys upon a lower shaft. One of the latter runs loosely upon, and the other is secured to, the lower shaft. With the ascent of the cage a projection from it engages with an arm that extends from the fixed pulley, and by lifting it causes a shaft to turn, whereby the gate will be raised and collapsed. With the further lifting of the arm, another arm, extending from the loose pulley, drops upon the ascending cage into engagement with another projection, and so the gate is lowered again, the former arm being at the same time lowered to its starting position. The gate is locked by the engagement of a pin upon a sliding-arm with an arm upon a shaft, which will be unlocked again by a cam which forces away the sliding-arm when the cage has arrived at the landing.

22,105.—COMPOSITE PAVEMENT FOR STREETS: *A. C. W. Hobman.*—Limestone, granite, Kentish rag or some such hard stone, is broken up to a 2-in. ring gauge, coated with mineral oil, asphalt, tar, Trinidad pitch, &c., mixed with a flux, laid upon a foundation of concrete, or "hard core," and then rolled. After a grouting of pitch or asphalt has been run into the interstices, the pavement is again rolled.

22,119.—A CONTRIVANCE FOR USE WITH WINDOWS: *A. E. Wright.*—Compressed springs are adapted to balance and shut the upper sash, and similar springs, under tension, serve to shut the lower sash. The two sashes are fastened to upper blocks that are cast upon the ends of the springs with screws or pins which will slide through slotted casings. In order that the sashes may be turned inwards the beads are made detachable, bolts or pivots of the upper casings are set so as to slide in angular slots cut in fixed plates, and the lower casings are pivoted on to the bottom of the frame.

22,125.—A WATER-METER: *W. G. Kent.*—The movement of a spring or weight which is regulated by a valve indicates the flow of water; a single-flap or two-flap valve is pivoted to its seat about a line between the edge and the centre line; a cover is provided for the removal of the valve, and keys fasten it in grooves in the casing; a cord is passed about a quadrant on the valve and thence to the recording-mechanism; movable counter-weights, or a spring, will regulate the valve. For a reverse flow the main valve is fitted with a spring-controlled pivoted valve.

22,139.—SLABS, &c., OF ARTIFICIAL STONE: *L. Hatschek.*—An admixture of fibrous animal, mineral, or vegetable substances, with a diluted portion of hydraulic lime or Portland cement, of which the setting is delayed by adding unburned gypsum, &c., is put into a tank whence it is fed by means of a sieve-drum to the surface of an endless band which passes it between pressure-rollers, and thence on to a drum fitted with a pressure-roller. The plate thus fashioned is stripped from the drum and cut into suitable lengths for finishing purposes.

22,151.—JUNCTIONS FOR PIPES: *J. Elrick.*—The invention relates to junction pieces or eyes, which are available for use with pipes of clay, stoneware, brass, or cast-iron alike; a flange maintains the collar of the junction-piece in its place after it has been fitted on to the pipe.

22,155.—A CONTRIVANCE FOR USE WITH VENTILATORS AND WINDOWS: *E. McGloughlin and J. C. McGloughlin.*—With the closing of the window a spring presses upwards a catch, which is pivoted to the sash, into engagement with a slotted plate affixed to the frame. The opening of the sash is limited with a jointed stay, of which one link has a flanged stop. The catch may be pulled back with a ring or handle, or with a cord passed around guide-pulleys, and the frame has a recess into which the stay will be folded after the sash has been shut.

22,165.—BUILDING-BLOCKS AND BRICKS: *W. Cockburn.*—The blocks and bricks are fashioned out of terra-cotta, stone, &c., with stepped or rebated bedding surfaces, in order that the passing of moisture through solid or hollow walls may be prevented.

22,177.—A COVERING COMPOSITION FOR WALLS, CEILINGS, AND OTHER SURFACES: *D. M. Sutherland.*—A waterproofing compound, made up of an oxidised or solidified vegetable oil and wood-flour, whitening, &c., mixed when hot, is applied to sheets of asbestos or paper as they are fed through calender rollers, or through embossing rollers.

22,189.—A COMBINATION TOOL: *M. C. Jackson and J. McDonough.*—One part of the shank on which the movable jaw is formed slides, but does not turn, in the tubular portion of the fixed jaw; the other part, which is screw-threaded, engages with the tubular handle, which has a swivel-joint with the tubular part of the fixed jaw that is grooved for a collar to be fitted on from one side only and has a roughened thumb-piece so that the parts will not be turned in respect of one another as the tool is being used. The attachments for the tool render it available as a pipe-wrench, and for conversion into a vice; in the latter form there is an L-shaped piece whereof one part can be screwed on to a bench, whilst the other part serves for a jaw, the shank being inserted through an aperture in that piece.

22,227.—DEEP-BORING MACHINERY: *J. Vogt.*—A pulley, on a loop of the rope, carries the boring rods, the two ends of the rope are passed around two pulleys mounted in the overhead frame and around the first-named pulley, one end of the rope is led to the winding-drum, and its other end is passed around a pulley upon the rocking beam and so to its point of attachment.

22,228. — FASTENINGS FOR ROOFING: *E. G. Hutchings.*—Slates, tiles, &c., are fastened to the battens of a roof by means of metallic strips, which are pierced and grooved for the heads of nails, near their lower ends are punched screw-holes for screws to be inserted through washers and fitting into notches cut in the lower edges of the slates

22,245.—APPLIANCES FOR LIFTING AND WINDING MACHINES: *W. R. Green.*—A shaft carries the drum, which is loosely mounted and driven with a clutch. The brake-sheave, loosely mounted, has pawls that will engage with the ratchet-wheel, which is affixed upon a boss. As the load is lifted the rotating drum is freed from the brake, but when the power is withdrawn the ratchet-wheel and the pawls become engaged, and thereby prevent a running-back of the load before the brake has been eased.

22,248.—AN INSTRUMENT FOR USE OF SURVEYORS AND OBSERVERS: *J. Waddell.*—The inventor seeks to provide means of ascertaining, by a single observation, the parallactical angle and there-

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from the range or distance of an object; of the two telescopes one is fixed, the other can be turned about a vertical axis so that its own axis shall converge to intercept the axis of the other telescope upon any distant object, the angle through which the converging telescope is turned will measure off the range upon a scale. Provision is made for the taking of an observation with the two telescopes at any one time, their eye-pieces being mounted upon arms that have reflectors at the angles. A finder is fitted for the fixed telescope, and the other one is adjustably affixed to a ring that can oscillate about a pin in the frame. The scale may be graduated to indicate either the distance of the object directly or the angle subtended at the object by the base of the instrument. For surveying purposes the lower circle of the pillar is divided for the reading off of azimuth angles. The stay-rod is graduated to indicate the co-sine of the angle of elevation or depression, so that one may ascertain the horizontal distance of objects that are above or below the horizon, or with a scale of co-secants for determining the height of an object.

22,302-3.—COMPOSITE MATERIALS FOR WALLS, FLOORS, PARTITIONS, &C.: *E. H. Bell.*—A compound of wood-wool, sawdust, ground cork, asbestos waste, and infusorial earth is boiled in a jacketed receiver with a solution of distilled water, 45 parts, crystallised chloride of magnesium, 55 parts, and chloride of ammonia, 1½ parts; an upper or wearing surface consists of fine sawdust mixed with the magnesium compound and mineral colours ground in boiled linseed oil. The composition is specified as being available also for tiles or plates for covering walls, ceilings, and so on. (22,303.) Slabs having fine interlaced channels are made of a plastic admixture of clay, infusorial earth, and a solution of calcium chloride that contains 10 per cent. of sulphate of magnesia, wood-wool, and asbestos waste. The tiles are made of burned cellular earthenware plates cemented to plates fashioned out of cork waste or similar substances, and have recesses that take the projecting ends of metallic strips, or the strips may be replaced with sheets and bands of wire gauze.

22,305.—SLUICE GATES: *F. E. Whiting.*—The inventor combines two sliding sluice gates, and causes the water pressures upon them to almost neutralise one another, so that the resultant pressure shall effect a close joint at one or both of the gates, which are intended for waterways, the outlet tower of a reservoir, or the hollow counterfort of a reservoir dam. The gates are attached parallelwise to a middle open frame so as to control the inlets. The lintel of the side frame is put forward enough to permit the one gate, which is rather larger than the other, to move between it and the frame, the motion being similar to that of a piston, with roller or other packing.

22,314.—AN APPLIANCE FOR USE WITH LADDERS: *G. Meyer.*—A middle perforated channel bar, two pivoted arms, and double hooks that will engage with a round of the ladder, constitute a bracket for a table or shelf. One of the arms forms a stay which is pivoted to a pierced sliding plate to be locked within the channel bar. The lever which fastens the contrivance supports an eccentrical plate having stepped slits, and is locked with a pin or wedge over a lower round of the ladder.

22,315.—AN INSTRUMENT FOR USE BY DRAUGHTSMEN AND OTHERS: *V. Reiswitz.*—The instrument is devised for measuring the angle between two surfaces and for plotting angles upon paper. On one of its two arms is mounted a disc through a slot wherein is passed the clamping-screw for engagement with the other arm; the two arms are grooved for their extension-pieces, to one arm is pivoted a plate of which the head engages with a groove in the other arm covered with a graduated plate for indicating the angle at which the arms are opened.

22,404.—APPARATUS FOR WATER-SUPPLY SERVICE: *F. Croppi and L. Edant.*—The regulating-valve of the service-pipe is fitted with an auxiliary starting-valve. Upon the stem of a piston, which is pressed upwards with a spring within a chamber, is mounted a valve for regulating the passage from the inlet to the outlet. A time-cock is fitted on a passage placed in communication with the upper and lower sides of the piston. A valve, which a spring retains upon its seating, prevents, under normal conditions, any communication between two pipes which lead to the auxiliary valve, but when the former valve is opened (by means of the push on its stem) water from the chamber that contains the piston flows away through the pipes to the outlet, whereupon the valve on the piston-stem, being relieved from pressure, will open, and permit the flush to flow. At the release of the push the valve is shut, and water will flow into the chamber, and so shut the valve on the piston-stem again. Other modifications of the invention are specified.

22,527.—VENTILATION APPARATUS: *W. F. Mc Gibbon.*—For ventilating a church or other building a flue is passed from the firing-chamber of a furnace in the basement to the ceiling or roof, or to cross-pipes and gratings through which foul air is abstracted. After the furnace has been fired-up for a strong draught, the firing-door and the door of the firing-chamber are shut, in order that the air which is needed for combustion shall be drawn only through the flue, and that foul air shall be drawn away too—the latter current being replaced with cool or heated air admitted through the ventilating gratings. The invention will, it is stated, facilitate circulation of heated air during the warming of the building by its heating apparatus.

22,537.—A ROAD SCARIFIER: *B. Asplen.*—The scarifier can be attached to a traction engine or a road roller, or be mounted upon a carriage. Its two rows of inclined adjustable tines are fastened with set screws in the slots of flanges at the ends of the inclined portions of the casing which slides within an outer casing, on the side walls of which are mounted carrying flanges. Pins retain buffer-springs that force the head of the inner casing against a washer upon an adjusting spindle, which is screw-threaded for engagement with a bush, and is flanged above the adjustable buffer-plate. A key-plug maintains the bush within its recess.

MEETINGS.

FRIDAY, APRIL 11.

Architectural Association.—1. Special meeting to consider some alterations and additions to the by-laws. 7 p.m. 2. Mr. W. D. Caröe on "The Preservation of Ancient Buildings." 7.30 p.m.

Royal Institution.—Professor Dewar, M.A., on "Problems of the Atmosphere." 9 p.m.

Glasgow Architectural Craftsmen's Society.—Mr. J. I. Little on "The Sewage Disposal of a Country House." 8 p.m.

Sheffield Society of Architects and Surveyors.—Annual meeting.

SATURDAY, APRIL 12.

Architectural Association.—Visit to the Eastern Telegraph Company's Offices, Finsbury Pavement, by permission of the architect, Mr. John Belcher, A.R.A. 2.30 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at the Sewage and Destructor Works, Ealing. 2.15 p.m.

MONDAY, APRIL 14.

Surveyors' Institution.—Mr. C. H. Hooper on "Compensation for Fruit Planting." 8 p.m.

Society of Arts (Cantor Lectures).—Mr. R. T. Glazebrook, M.A., on "Glass for Optical Instruments." I. 8 p.m.

Bristol Society of Architects.—Annual General Meeting: (1) Election of Council and Officers; (2) Mr. J. Atwood Slater on "A Continental Tour." 8 p.m.

Clerks of Works Association.—Twentieth annual meeting, Carpenters' Hall. 7.30.

TUESDAY, APRIL 15.

Institution of Civil Engineers.—Papers to be further discussed—"The Greenwich Footway-Tunnel," by Mr. W. C. Copperthwaite; "Subaqueous Tunnelling through the Thames Gravel: Baker-street and Waterloo Railway," by Mr. A. H. Haigh, B.Sc.; and paper to be read "On Locomotive Fire-box Stays," by Mr. F. W. Webb. 8 p.m.

WEDNESDAY, APRIL 16.

British Archæological Association.—(1) Mr. Andrew Oliver on "Some Old London Views;" (2) Rev. J. A. Penney, M.A., on "Curiosities I have seen in and about Churches." 8 p.m.

Society of Arts.—Mr. J. Bridges Lee, M.A., on "Photography as Applied to Architectural Measurement and Surveying." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Quarterly meeting of the members. 8 p.m.

THURSDAY, APRIL 17.

Society of Arts (Indian Section).—Mr. Sidney Preston, A.M.Inst.C.E., on "Recent Developments in Punjab Irrigation." 4.30 p.m.

Institution of Electrical Engineers (Dublin Section).—Mr. A. T. Kinsey on "Railway Blocks, Telegraphs and Accessories, recent practice." 8 p.m.

FRIDAY, APRIL 18.

Architectural Association Discussion Section.—Mr. A. Needham Wilson on "A Tour through the South of France." 7.30 p.m.

Royal Institution.—Right Hon. Sir John H. A. Macdonald on "The Autocar." 9 p.m.

Institution of Mechanical Engineers.—Mr. R. E. Atkinson on "The Standardisation of Pipe Flanges and Flange Fittings." 8 p.m.

Institution of Civil Engineers. (Students' Meeting).—Mr. H. C. M. Austen on "The Erewash Valley Widening and Toton Sidings." 8 p.m.

SATURDAY, APRIL 19.

Liverpool Architectural Society (Incorporated).—An Excursion to the new Gladstone Memorial Library at Hawarden. The Church and the Castle will be visited if time permit. Tea at the Glynn Arms Hotel at 5.30.

Edinburgh Architectural Association.—Visits: (1) To Traquair House; (2) The Tower of Innerleithen.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 3.—By NEWBON, EDWARDS, & SHEPHARD.

Kingsland.—Boleyn-rd., the Sutton Arms b.-h., &c., f.g.r. 33*l.*, reversion in 22½ yrs. £1,340
Boleyn-rd., f.g.r.'s 18*l.* 10s., reversion in 55½ yrs. 520
180, 184, and 186, Boleyn-rd. (S.), f., y.r. 62*l.* 12s. 965
Boleyn-rd., the Woodman b.-h., f., y.r. 37*l.* 10s. 1,700
192, Boleyn-rd. (S.), f., y.r. 26*l.* 405
Stoke Newington.—St. Matthias-rd., f.g.r. 45*l.*, reversion in 29 yrs. 1,510
St. Matthias-rd., f.g.r. 31*l.* 10s., reversion in 28 yrs. 1,630
Highbury.—14, Bryantwood-rd., u.t. 97 yrs., g.r. 9*l.*, y.r. 42*l.* £430
Barnsbury.—27, Huntingdon-st., u.t. 47 yrs., g.r. 7*l.*, y.r. 45*l.* 530

By ROGERS BROS.

Dulwich.—77 and 79, Melbourne-grove, u.t. 67½ yrs., g.r. 13*l.*, y.r. 58*l.* 620

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 11 6	per 1,000	alongside, in river.
Rough Stocks and Grizzles	1 9 6	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 5 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts ..	1 12 0	,,	,, ,,
Best Fareham Red	3 12 0	,,	,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,,	,,
Do., Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 5 6	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers..	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers..	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0 ,,	,,
Best Portland Cement	32	0	per ton, delivered.
Best Ground Blue Lias Lime..	25	0 ,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s od. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
Ancaster in blocks	1 11	per ft. cube, deld. rly. depot	
Bath ,, ...	1 7	,,	,,
Farleigh Down Bath ..	1 8	,,	,,
Beer in blocks	1 6	,,	,,
Grinshill ,, ...	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks..	2 4	,,	,,
Red Corsehill ,,	2 5	,,	,,
Closeburn Red Freestone	2 3	,,	,,
Red Mansfield ,,	2 4	,,	,,
Hard York in blocks ..	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup)	2 8	per ft. super. at rly. depôt.	
,, ,, 6 in. Rubbed Ditto..	3 0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 2 in. self-faced Ditto	0 9½	,,	,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.	
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.	
,, ,, ,, 3 in. do.	1 2½	,,	,,

SLATES.

in. in.	£ s. d.		
20 × 10 best blue Bangor..	12 0 0	per 1000 of 1200 at rly. dep.	
,, best seconds ,,	11 10 0	,,	,,
16 × 8 best ,,	6 15 0	,,	,,
20 × 10 best blue Portmadoc	11 5 0	,,	,,
16 × 8 best blue Portmadoc	6 0 0	,,	,,
20 × 10 best Eureka unfading green....	12 2 6	,,	,,
16 × 8 ,, ,,	7 5 0	,,	,,
20 × 10 permanent green	10 5 0	,,	,,
16 × 8 ,, ,,	5 17 6	,,	,,

[See also p. 381.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Police and Fire Brigade Buildings	County Borough of Sunderland	100*l.*, 50*l.*, and 25*l.*	Aug. 30

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Laundry, Pontnewynydd	Pontypool Steam Laundry Co.	D. J. Lougher, Architect, Bank Chambers, Pontypool	April 16
Two Shops, Kendal	.....	J. Bintley, Architect, 7, Lowther-street, Kendal	April 15
Additions to Offices, Dudwick, Ellon	.....	Wilsome & Duffus, Aberdeen	do.
Sewers, Bryn	Margam U.D.C.	J. Cox, Surveyor, Port Talbot	do.
Sewers, Witheridge	South Molton R.D.C.	W. S. Gardner, Surveyor, Chittlehampton	do.
Sewerage Works, Bury-road	Rochdale Corporation	S. S. Platt, Civil Engineer, Town Hall, Rochdale	do.
Cottage, Crumlin, Mon.	Great Western Railway Co.	G. K. Mills, Paddington Station, W.	do.
Road Materials	Knaresborough R.D.C.	J. Smith, 44, Station-parade, Harrogate	do.
Additions to Schools, Ditchling-road	Brighton School Board	T. Simpson & Son, Surveyors, 16, Ship-street, Brighton	do.
Alterations to Workhouse	Dromore West (Ireland) Guardians	H. Naughton, Board Room, Dromore West	do.
Sea Embankment Works	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, North Shields	do.
Thirty-seven Cottages, Pontypridd	.....	T. R. Phillips, Architect, Old Bank Chambers, Pontypridd	April 16
Five Houses, Langdale-road, Barnsley	.....	R. & W. Dixon, Architects, 5, Eastgate, Barnsley	do.
Alterations to Stockwell Mount, Batley	.....	H. B. Buckley, Architect, 55, Commercial-street, Batley	do.
Additions to Hospital, Llanelly	.....	W. Griffiths, Architect, Falcon Bridge, Llanelly	do.
Alterations to Institute, Ipswich	.....	Eade & Johns, Architects, Cornhill Chambers, Ipswich	do.
Alterations to Church, Richmond-terr., Whitehaven	.....	J. S. Moffat, Architect, 53, Church-street, Whiteaven	do.
Business Premises, Brampton, Cumberland	.....	T. T. Scott, Architect, 43, Lowther-street, Carlisle	do.
Road Works, King's-road	.....	G. J. Wooldridge, Surveyor, Woking	do.
Sewerage Works	.....	J. Turner, Surveyor, Saffron-lane, Glen Parva	do.
Sewerage Works, Lea Bridge-road	.....	W. Dawson, Civil Engineer, Town Hall, Leyton	do
Bandstand	.....	A. Fidler, Civil Engineer, Southend	do.
Footbridge, Hampton Mills	.....	A. W. Bradley, Civil Engineer, Corporation Offices, Bury	do.
Additions to Netherfield Works, Windermere	.....	R. Walker, Architect, Windermere	do.
*Supply and Fixing of the Firemains Hydrants	Woking U.D.C.	F. J. Sturdy, 45, Finsbury-pavement, E.C.	do
Hall, Drumcree, Portadown	Blaby (Leics.) R.D.C.	J. W. Walby, Architect, Portadown, Ireland	April 17
Two Cottages, Sutton Scotney, Hants	Leyton (Essex) U.D.C.	W. & G. A. Bell, Architects, Andover	do
Six Houses	Southend Corporation	R. Holdsworth, Society's Offices, Silsden	do.
*Sewer Flushing Van	Bury (Lancs.) Corporation	W. H. Mansbridge, Surveyor, 40, High-street, Barnet	do.
*Road Making, Kerbing, Paving, &c.	Messrs. Somervell Brothers	Council's Engineer, Town Hall, Hackney, N.E.	do.
*Building & Decorating Works, 180 & 182, Peckham Rye	West Ham Union	Newman & Newman, 31, Tooley-street, S.E.	do.
*New Coastguard Buildings, near Falmouth	.....	Director of Works Dept., Admiralty, 21, Northumberland-avenue	April 18
Church and School, Stainton	Silsden (Yorks) Co-op. Soc., Ltd.	J. W. Dickson, 2, Fairview, Dalton-in-Furness	do.
Roads, Cwmneol, Cwmaman	South Minns R.D.C.	Smith & Davies, Architects, Aberdare	do.
Road Works	Hackney Borough Council	T. W. Golds, Surveyor, Thorpe-le-Soken, Essex	do.
Street Works, Brook-street	St. Olave's Union	City Engineer, Town Hall, Hull	do.
Bridge Works, Hebers Ghyll	Admiralty	Surveyor, Council Offices, Ilkley	do.
Waterworks	.....	W. R. Copland, C.E., 146, West Regent-street, Glasgow	do.
Road Works, Bernard-road, &c.	.....	A. F. Scott, Surveyor, Church-street, Cromer	do.
Store Premises, Thornhill, Lees	Frinton-on-Sea U.D.C.	Holtom & Fox, Architects, Corporation-street, Dewsbury	do.
Car Shed, Holderness-road	Hull Corporation	A. E. White, Civil Engineer, Town Hall, Hull	do
Church Restoration, Micklegate, York	.....	C. H. Fowler, Architect, Durham	April 19
Schools, Edgeworths Town, Ireland	.....	T. F. MacNamara, Architect, 50, Dawson-street, Dublin	do.
Congregational Hall, Gateshead	.....	A. L. Armour, 16, West-street, Gateshead	do.
Chapel, Runham, Great Yarmouth	.....	A. S. Hewitt, Architect, Regent-street, Great Yarmouth	do.
House, &c. Glenbucket	.....	Jenkins & Marr, C.Es., 16, Bridge-street, Aberdeen	do.
Road Materials	Maidstone U.D.C.	F. Bunting, Borough Surveyor, Fair Meadow, Maidstone	do
Road Metal	Southborough (Kent) U.D.C.	P. Hanmer, Council Office, Southborough	do.
Church, Landore, near Swansea	Rev. W. Morgan	E. M. Bruce Vaughan, Architect, Cardiff	do.
House Dacre-terrace, Londonderry	Mr. J. Alexander	J. M'Intyre, Architect, Letterkenny	do.
Additions to Workhouse	Haverfordwest Guardians	D. E. Thomas, Architect, Victoria-place, Haverfordwest	do.
Street Works, Kenton-avenue	Harrow-on-the-Hill U.D.C.	J. P. Bennetts, Engineer, Council Offices, Harrow	do.
Landing Stage Works, Seacombe	Wallasey U.D.C.	Wood & Fowler, Engineers, 3, Cook-street, Liverpool	do.
Sewers, near Stockport	Marple U.D.C.	H. Bancroft & Son, Civil Engineers, 88, Mosley-st., Manchester	do.
Quay Wall	Ayr Harbour Trustees	T. Meik & Sons, Engineers, 29, St. Andrew-square, Edinburgh	do.
Alterations to Farm Buildings, &c., Golgotha	Lancaster Corporation	T. C. Hughes, Town Hall, Lancaster	do.
Well Sinking, Cliddesden	Basingstoke Town Council	G. Fitton, Town Hall, Basingstoke	April 21
Additions to Church, Kilkeel, Ireland	.....	S. P. Close, Architect, Belfast	do.
Eight Cottages, Gellyrheina, Wales	.....	The Manse, Chapel-lane, Carndiffaith, Mon	do.
Additions to Inns, Lancaster	.....	J. Greene, Architect, Meeting House-lane, Lancaster	do.
Houses, Bective-road, Kirby Lonsdale	.....	J. F. Curwen, Architect, 26, Highgate, Kendal	do.
House, Wardhouse, N.B.	.....	J. Graigen, 193, Union-street, Aberdeen	do.
Alterations to Sewage Disposal Works	.....	F. H. Anson, Engineer, 15, Dean's Yard, S.W.	do.
Road Works, Oxford-road	Eastry R.D.C.	C. G. Mason, Civil Engineer, Tunsgate, Guildford	do.
Building Works, High-street	Guildford Town Council	Boston & Co., Architects, 180, Hope-street, Glasgow	do.
Sewers, &c. (Contract 11)	Glasgow Corporation	J. Diggle, Civil Engineer, Heywood, Lancs.	do.
Grit Setts	Chadderton (Lancs) U.D.C.	A. T. Swain, Surveyor, Council Offices, Ince	do.
Houses, Dublin	Ince (Lancs) U.D.C.	Engineer, Amiens-street Terminus, Dublin	do.
Granite Road Metal	G. N. Railway Co. (Ireland)	W. O. Times, Council Offices, Stevenage	do.
*Section and Road Name Plates, Islington Cemetery	Stevenage (Herts) U.D.C.	Borough Engineer, Town Hall, Upper-street, N.	do.
*Boundary Walls, Shepherd's Bush	Islington Borough Council	J. H. Richardson, Architect, 87, Finsbury-pavement	do.
*Boundary Walls and Railing, Wormwood Scrubbs	Hammersmith Guardians	Giles, Gough, & Trollope, Architects, 28, Craven-street, Strand	do.
*Street Improvement Works	do.	Council's Surveyor, Bromley, Kent	April 21
*Supply of Road Materials	Bromley U.D.C.	do.	do.
*Making-up Roads, &c.	do.	Council's Engineer, 712, High-road, Tottenham	do.
*Wrought Iron Railings and Gates	Tottenham U.D.C.	Borough Engineer, Town Hall, West Ham, E.	do.
*Steam Road Roller Shed and Offices	West Ham Council	do.	do.
Lodge, South Park	do.	H. Shaw, Civil Engineer, Town Hall, Ilford	do.
Business Premises, Darwen-street, Blackburn	Ilford U.D.C.	Stones & Stones, Architects, 10, Richmond-terrace, Blackburn	do.
Sewerage Works	L. & Y. Bank, Limited	T. J. Cooper, Council Offices, Biggleswade	do.
Street Works	Biggleswade R.D.C.	Council's Engineer, Town Hall, Walthamstow	do.
*Extension Electric Tramcar Station and Depot	Walthamstow U.D.C.	Council's Engineer, Wakefield-street, East Ham, E.	do.
*Main Sewerage Works	East Ham U.D.C.	Council's Offices, Kingsbury-road, N.W.	do.
*Supply of Timber	Kingsbury U.D.C.	Ordnance Survey Office, Southampton	April 23
Shed	Director-General, Ordnance Survey	A. Price, Architect, Elworth	do.
Police Buildings, Uckfield	Congleton R.D.C.	F. J. Wood, Surveyor, County Hall, Lewes	April 25
*Erection of Police Buildings	East Sussex County Council	County Surveyor, County Hall, Lewes	do.
*Sewerage Works	East Sussex County Council	J. C. Melliss, Engineer, 264, Gresham House, E.C.	April 28
Dock Extensions, Hull	Sittingbourne U.D.C.	T. M. Newell, Engineer, Dock Office, Hull	April 30
Asphalting Works at Cemetery	North Eastern Railway Co.	H. Horner, 9, Royal Parade, Harrogate	do.
*Shelter, Conveniences, &c., Island Gardens, Poplar	Harrogate Burial Board	General Section, Archt's. Dept., County Hall, Spring Gardens	do.
Making-up and Paving Waldemar-avenue	London County Council	Borough Surveyor, Town Hall, Walham Green, S.W.	do.
*House for Private Patients	Fulham Borough Council	G. T. Hine, Architect, 35, Parliament-street, S.W.	May 2
House, Rawcliffe, Yorks	Dorset County Lunatic Asylum	E. C. B. Tudor, Civil Engineer, Burlington Crescent, Goole	No date
Additions to Schools	Mr. Cox	E. J. Harding, School Board Offices, Gateshead	do.
Excavation Works, Sedgwick, near Kendal	Gateshead School Board	A. Foulton, Sedgwick, near Kendal	do.
Road Works, Rainham, Kent	.....	M. Harvey, Rainham	do.
Alterations to Schools, Buxton	Trustees	Garlick & Flint, Architects, Terrace-road, Buxton	do.

[See also next page.

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PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Chief Engineer and Surveyor	County Borough of Northampton.	600*l.* per annum	April 16
*Clerk of Works	Dover Union	34*s.* per week	do.
*Second Class Draughtsman	Metropolitan Asylums Board	125*l.*	April 21
*Clerk of Works	Lambeth Guardians	47*s.* 4*d.* per week	April 22

Those marked with an asterisk (*) are advertised in this Number. *Competition, p.* iv. *Contracts, pp.* iv. vi. viii. & x. *Public Appointments,* xviii. & xvii.

PRICES CURRENT (*Continued*).

TILES.

	s.	d.	
Best plain red roofing tiles	41	6	per 1,000, at rly. depôt.
Hip and valley tiles	3	7	per doz.
Best Broseley tiles	48	6	per 1,000
Hip and valley tiles	4	0	per doz.
Best Ruabon Red, brown or brindled Do. (Edwards)	57	6	per 1,000
Do. ornamental Do.	60	0	,,
Hip tiles	4	0	per doz.
Valley tiles	3	9	,,
Best Red or Mottled Staffordshire Do. (Peakes)	50	9	per 1,000
Hip tiles	4	1	per doz.
Valley tiles	3	8	,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 0 0
Deals: best 3 by 9	13 10 0	15 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in	10 10	11 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0 ,, ,, ,,	
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2½ by 4½ in. and 2 in by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft.	
	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft.)	3 0 0	3 10 0
JOINERS' WOOD.	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
,, ,, 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 0 0	15 0 0
,, ,, 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
,, ,, 3 in. by 9 in.	12 0 0	13 0 0
,, ,, battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
¾ in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6

PRICES CURRENT (*Continued*).

WOOD.

Prepared Flooring.	Per Square. £ s. d.	£ s. d.
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 15 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Common Bars	7 15 0	8 5 0
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 10 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g.	16 0 0	- - -
,, ,, 22 g. and 24 g.	16 10 0	- - -
,, ,, 26 g.	18 0 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 0 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 5 0	9 15 0

LEAD, &c.

	Per ton, in London £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 0 0	- - -
Pipe in coils	14 10 0	- - -
Soil Pipe	17 0 0	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0	- - -
Thin ,,	0 1 1½	- - -
Copper nails ,,	0 1 1½	- - -
BRASS— Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths	3d. ,, ,,
26 oz. thirds	4½d. ,, ,,
,, fourths	4d. ,, ,,
32 oz. thirds	5½d. ,, ,,
,, fourths	5d. ,, ,,
Fluted sheet, 15 oz.	3d. ,, ,,
,, 21 ,,	4d. ,, ,,
½ Hartley's Rolled Plate	2d. ,, ,,
⅝ ,, ,, ,,	2½d. ,, ,,
¾ ,, ,, ,,	2¾d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 9
,, ,, ,, in barrels	,,	0 2 10
,, ,, ,, in drums	,,	0 3 0
Boiled ,, ,, in pipes	,,	0 2 11
,, ,, ,, in barrels	,,	0 3 0
,, ,, ,, in drums	,,	0 3 2
Turpentine, in barrels	,,	0 2 6
,, in drums	,,	0 2 8
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	,,	20 10 0
Best Linseed Oil Putty	per cwt.	0 8 6
Stockholm Tar	per barrel	1 12 0

PRICES CURRENT (*Continued*).

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

A. D. G.—E. O. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

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Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BROMLEY (Kent).—For proposed addition, Billiard-room, &c., to the Conservative Club. Messrs. B. Wadmore and W. R. Mallett, architects, London:—

	Buildings. £ s.	Fittings, &c. £ s.	Total. £ s.
W. C. Tapley	985 12	43 0	1,017 12
Fry & Willson	871 0	45 0	916 0
F. P. Duthoit	855 0	43 0	898 0
D. Payne	858 0	39 0	897 0
Crossley & Son	839 0	45 0	884 0
T. D. Graty	833 0	41 0	874 0

[All of Bromley.]

CARLISLE.—For the restoration of Kirklinton Church. Mr. J. H. Martindale, architect, Viaduct-chambers, Carlisle:—

Ceilings, Seats, &c.			
J. Phillips	£1,520 0	G. Black, Carlisle†	£1,176 6
J. H. Reed	1,439 0		
Painters' Work.			
Taylor & Clifton	£412 0 6	D. Canning	£60 0 0
W. M. Hill & Son	88 12 6	R. S. Kirk	49 17 6
R. M. Hill & Son	74 0 0	Penfold & Son, Brampton*	34 17 6
		R. Westray	34 0 0
Heating Apparatus.			
Langfield & Co.	£98 0 0	Dargue, Griffiths, & Co.	£62 8 6
Grindrod & Co.	79 0 0	Corbett & Son	52 16 0
Greenwood & Co.	73 0 0	H. Skidmore	48 0 0
Dinning & Cooke	67 17 6	Seward & Co., Preston†	38 8 0
Werner, Pfleider, & Perkins	63 8 6		

CARLISLE.—For the erection of two bridges, Stapleton, for the Longtown Rural District Council. Mr. James Murray, surveyor, Kirklinton, Carlisle. Quantities by surveyor:—

Murray & Son, Stapleton, Brampton*	£379 13 1
Kayshouse Burn Bridge	£211 2 8
Bogburn Bridge	168 10 8
	£379 13 1

[Surveyor's estimate, £380.]

[*See also next page.*

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EDMONTON.—For building married couples' quarters at the Workhouse, Silver-street, Edmonton, for the Guardians of the Strand Union. Mr. A. A. Kekwick, architect, 18, Outer Temple, Strand. Quantities supplied :—

Chessum & Sons	£4,872	Jarvis & Sons	£4,446
Willmott & Sons	4,770	Foster Bros.	4,387
Dearing & Son	4,659	T. G. Sharpington	4,349
Lawrence & Son	4,593	A. Monk, Lower Edmonton‡	4,330
J. Appleby	4,530	J. O. Richardson	4,058
B. E. Nightingale	4,512		
Shillitoe & Son	4,500		

‡ Recommended for acceptance.

EGHAM.—For new classrooms and alterations to the Station-road Schools, for the Egham School Board. Mr. James W. Oades, architect and surveyor, Egham, Surrey :—

Geo. Gray	£1,837	W. Beauchamp	£1,669
W. Searle	1,687	C. Buckeridge*	1,637

LLANEDY (Carmarthen). — For the erection of a school, Tycroes, for the School Board. Messrs. J. Davies & Son, architects, Cowell House, Llanelly :—

J. Vaughan	£2,010	Howell & Son, Ltd., Llanelly*	£1,503
J. Thomas	2,010		
Brown, Thomas, & John	1,519		

LLANELLY.—For enlarging and rebuilding Penhryn Chapel, Crosslands, Llanelly. Messrs. J. Davies & Son, architects, Llanelly :—

Lewis Davies	£1,135 0	Thomas & Sons	£953 13
J. & H. Vaughan	1,050 0	Brown, Thomas, & John, Llanelly*	950 0
Jones & Richards	996 0		

LLANELLY. — For house in Marble Hall-road, Llanelly, for Mr. W. Lewis, B.A. Messrs. J. Davies & Son, architects, Llanelly :—

Thomas & Sons	£683 8 6	Brown, Thomas, & John*	£554 0 0
Jones & Richards	631 0 0		
John Evans	565 0 0		

LLANGENNECH.—For erecting house and shop at Llangennech, for Mr. David Evans. Messrs. J. Davies & Son, architects, Llanelly :—

W. James	£229 7	J. Evans, Llanelly*	£193 0
W. Thomas	195 0		

LLANGENNECH.—For erecting house at Llangennech, for Mr. John Jones. Messrs. J. Davies & Son, architects, Llanelly :—

J. Evans, Llanelly* £290

LLANGENNECH. — For erecting two houses at Llangennech, for Messrs. David John Lewis & Abel Lewis. Messrs. J. Davies & Sons, architects, Llanelly :—

W. Thomas, Llangennech* £370

LONDON.—For the construction of new floors, &c., at Millwall, for the Electrical Power Storage Co., Ltd. Mr. Alfred Roberts, architect, Greenwich, S.E. :—

Yates & Co.	£2,193	H. Groves	£1,689
W. Mills	1,798	W. Martin*	1,687
T. D. Leng	1,737		

LONDON.—For alterations to Notting Dale Police Station. Mr. Dixon Butler, Architect :—

Willmott & Sons	£3,046	F. & H. F. Higgs	£2,694
T. Boyce	2,978	Lascelles & Co.	2,688
Higgs & Hill	2,884	J. Parker	2,670
Lathey Bros.	2,747	Grover & Sons	2,625
Holloway Bros.	2,740	C. Ansell	2,585

OSWESTRY.—For the construction of a swimming bath, the erection of a boiler house, chimney shaft, laundry, and other buildings at the Gymnasium, Victoria-street, for the Town Council. Mr. G. William Lacey, C.E., Borough Engineer and Surveyor :—

J. Higgins	£1,547 0 0	Jones & Evans, Oswestry*	£1,470 7 0
H. Price	1,520 0 0		
W. H. Thomas	1,487 11 3		

[Borough Engineer's estimate ..... £1,500.]

PEAR TREE GREEN (Hants).—For the erection of schools, High-street, for the St. Mary Extra (U.D.) School Board. Messrs. Mitchell, Son, & Gutteridge, architects, 9, Portland-street, Southampton :—

Hinton Bros.	£6,500	Jenkins & Sons, Ltd.	£5,985
Witt Bros.	6,475		
H. Cawte	6,178	Stevens & Co., Southampton*	5,860
Rashley & Son	6,083		

THORNHILL (Yorks).—For additions to cottage, Overthorpe-road, for the Urban District Council. Mr. S. W. Parker, Surveyor, Council Offices, Thornhill :—

Masonry.—Ellis P. Sheard, Thornhill	£104 10 0
Slating.—G. Hargreaves, Dewsbury	16 10 0
Joinery.—Wilson Bros., Dewsbury	39 0 0
Plastering.—A. Booth, Mirfield	10 15 6
Plumbing.—F. Mitchell, Savile Town	13 14 0
Painting.—B. Smith, Thornhill	2 5 0

UXBRIDGE.—For the erection of a pair of villas, Lawn-road. Mr. W. L. Eves, architect, 54, High-street, Uxbridge :—

H. C. Belch	£725 0	W. Fry	£570 0
Briant & Son	670 0	W. H. Randall, Uxbridge*	530 0
Ward & Sons	595 10		
J. James	590 0		

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The Builder.

VOL. LXXXII.—No. 3089 APRIL 19, 1902.

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Pugin Studentship Drawings..... By Mr. C. Wontner Smith.
Two London Houses..... Mr. C. J. Harold Cooper, architect.

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Some Books on Perspective.

BOOKS on perspective almost always remind us of the story of Rossini taking up an elaborate treatise on counterpoint by Fétis, in the presence of its author, and saying, after turning over the leaves rapidly for a minute or two, "My dear Fétis, does it take all this learning in order to compose?" So one is tempted to say, on turning over books on perspective—"Does it take all these pages and diagrams to expound so simple a matter?" For surely perspective is really a very simple matter—until people come to explain it. It is the explanations that puzzle students. Any one who has once drawn a square box in perspective, and has learned how to fix the apparent position on the picture plane of any point in a geometrical diagram, has grasped the science of perspective; all the rest is only detail; even the direction of lines which are not level need not trouble him, since we have it on the best authority that "the extremities of a line are points." Theoretically even the drawing of curves comes into the same category, since they can be formed by taking a sufficient number of points; but since the finding of a great number of points is not only irksome but is liable to instrumental error, it comes about that the drawing of circles and other geometrical curves in perspective is partly a matter of eye and observation, and thus an element of art is introduced into what otherwise is an exact science. For that is the difference between perspective and foreshortening; the one is science, the other art; and it is rather a curious thing that many painters who have mastered the difficult art of foreshortening a body or a limb have never acquired the amount of perspective science necessary to put a circle or a part of one in true perspective, though they might have acquired it at one-twentieth part of the study and training necessary to draw the figure in a foreshortened position.

An American architect, Mr. W. P. P. Longfellow—the inheritor of a name beloved on both sides of the Atlantic—in the preface to his important work on perspective,* admits the position that "the practice of perspective depends not so much on many principles as on the varied application of a few." Writing for painters as well as architects, and feeling, as he well says "the paramount importance of what may be called the perspective sense, the faculty of perceiving perspective relations on what is before one in nature or in imagination," he has commenced by setting forth these relations as they appear to the eye, showing how they influence the architect's and the painter's way of looking at things. The problem for the architect and the painter is in some respects a different one, in practice though not in theory; the architect is concerned in general with the lines of a building and a few of its immediate surroundings; the painter, unless painting an interior or a foreground figure subject, is concerned with the sweep of the perspective of a whole landscape. The laws which govern the perspective appearance of the building are the same which govern that of the landscape; a fact which is not always recognised, for the definite and sharply-defined geometrical lines of a building seem to admit of reduction to a scientific law in a manner in which the more irregular contours of a landscape do not. And as regards details this is so; an arch, which we know is an exact geometrical shape, must be represented in perspective with scientific accuracy, or a sense of distortion is the result; a tree, a hedge, or a hill, not being bounded by geometric curves, may be varied from what ought to be its perspective line without offence to the eye. In landscape perspective in small details is for this reason of less consequence than in architecture—their forms are not so rigidly defined; but the perspective of the whole composition is of the first importance. Mr. Longfellow, however, alludes to instances in which the true effect of the perspective in the relation of the landscape to the horizon has been entirely missed; though we are not sure whether his reasoning is not open to question on one point. The horizon is the height of the eye; and as he says, looking down from a height on a plain, the head of any person on that plain, near or far, must come below the horizon, unless it is the head of a giant. He proceeds to apply the same reasoning to ships; if the observer looks out upon the sea, all the vessels on it will be cut by the horizon at the same number of feet above the water, irrespective of their distance from the observer; and he mentions the case of sea-paintings in which near vessels are below the horizon, and distant ones rise above it, irrespective of their size. That is a true criticism within certain limits. If the eye is on the same height as the deck of a "liner," the deck will appear level with the horizon, and the top of the mast of a small boat, which is the same height as her deck, will also touch the horizon, whether said boat is a mile nearer or a mile further off than the liner. But there comes a limit to this reasoning when the liner approaches the horizon; her hul does not go down flat, it stands visibly above the horizon line and then gradually drops below it. Mr. Longfellow recognises this in a footnote, but dismisses it with the reflection that ships at this distance are not subjects for pictures; but we hardly think the discrepancy in the theory can be dismissed in so casual a manner as that. Ships in such a position, if not "subjects for pictures," are subjects *in* pictures, and in the case of vessels of the largest size, the point where the deck would appear to rise above the horizon is not at the extreme limit of view. The reason of course is that, the surface of the earth being a curve, the vanishing plain is not illimitable. We agree that in the majority of cases it may be treated as if it were; but we think a little more importance should have been attached to this point in the text, instead of throwing it into an apologetic footnote.

It is difficult for those long accustomed to perspective drawing to put themselves in the position of the beginner to whom it is all new; but as far as we can do so it appears to us that Mr. Longfellow's exposition of perspective as applied to architectural drawing is very clear and lucid. What he says as to the drawing of circles in perspective is very useful, and might draw the attention even of experienced artists to points that are often overlooked. As a general rule we think that architectural draughtsmen know very well how to draw circles in perspective—in this country at all events; but it is quite certain

* "Applied Perspective for Architects and Painters." By W. P. P. Longfellow. Boston and New York; Houghton Mifflin & Co.

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that many painters do not. Our observation is entirely in accordance with that of Mr. Longfellow, when he observes that "comparatively few painters put into their pictures an arcade or a round tower banded with string-courses at which the eye trained to such things can look without offence. . . . . The relation of the successive string-courses of a round tower is full of grace which is often unseen by those who paint them. The rings merge into the vertical lines by delicate tangent curves, yet it is common to see them drawn with a corner" (at the junction with the bounding vertical line of the wall). This is exactly what we have frequently pointed out in relation to the drawing of St. Paul's dome and its cornice curves; a rather favourite subject with painters, who almost invariably show that they do not know how to draw it. It is a useful remark on the same page that "it is common even among artists to believe that the perspective ellipse of a vertical circle stands upright, that is, that its longest diameter is vertical"; the author shows that it is not, and why; and that this idea is true only when the centre of the vertical circle is on the horizon line, so that the perspective curve is in the same relation to the vertical both above and below the horizon line. Otherwise, the major axis of the ellipse is more or less out of the perpendicular.. It is a confusion of perception on this subject which has led some writers on perspective to deny that the circle in perspective is an ellipse. On the other hand, however, when the author gives a reproduction of a photograph of a clockface on a tower at Como, to show how far distortion may take place in a perspective circle in certain positions, he is overdoing his case, as what he presents is a photographic distortion arising from taking a too near point of view. A perspective drawing logically constructed from the same point of view would present, no doubt, the same distortion, but it would result from the initial mistake of adopting a standpoint too close to the picture plane, and endeavouring to include too large an angle of vision in the view.

Mr. Longfellow adopts what we believe is a new term in regard to the vanishing points of two series of lines at right-angles to each other; in view of their close perspective relation, he says, "they may be called conjugate vanishing points, and will be so called here." There is no doubt a close geometrical relation between them in the setting-out diagram, as illustrated in the simple method he suggests of getting the second vanishing point after the first has been determined, by merely drawing, from a centre on the horizontal line, a circle which shall cut the vanishing point and the end of the vertical line, the cutting of the horizontal line at the opposite side of the circle giving the other vanishing point, since a right-angle is necessarily included in the half circle. This looks very neat, though we do not know that it is really any quicker than laying out the right angle with a square. Nor do we see why, except in regard to this geometrical relation in setting out, there should be supposed to be any closer relation between the vanishing points of two sides of a building which are at right angles, and two which are a little less or a little more than a right angle. The problem is practically the same, after all, and it seems to us that this title of conjugate vanishing points is little better than a piece of nomenclature, and a somewhat unmeaning one, if not misleading. We have a chapter, later on, on tri-conjugate vanishing points, where for instance a cube lies on a surface inclined to the horizon, so that none of its edges are vertical, and none parallel to the picture. The case is illustrated with some elaborate diagrams, which appear to us, as in other cases in this and other treatises, to obscure and befog what should be a very simple problem. Mr. Longfellow's treatise, however, is a very good one for those who like to have the whole subject argued out and demonstrated; only we incline to think that he who cannot draw anything or everything in perspective without all this investigation and diagrams will never be much of a perspective hand, except in theory.

Mr. R. G. Hatton's smaller book* is a much more rudimentary one, but it is admirably adapted for giving a young student first ideas as to the meaning of perspective; and the illustrative diagrams and sketches, somewhat rough though they are, tell their story very plainly. He commences by pointing out that as a rule all forms may be said to be enclosed in a cube form or a parallelopiped form, and that in these forms the lines go in three directions only, to the right, to the left, and upward ("vertically" would be a better definition). "He who has mastered these three lines, especially if he can sketch them in by freehand, has mastered perspective." Mr. Hatton goes on the principle of showing the student practically what perspective is, and in what consists the nature of a perspective representation, before entering on the geometrical proof. This is the reverse of the system usually adopted in perspective treatises; but as a means of giving an idea of the object aimed at, and of the nature of the method employed, there is much to be said for it. The rough sketch of an artist sitting before a large canvas in the open country, with the main lines of the landscape carried on over it so that they may either be regarded as the real lines seen *through* the canvas, or as their representation *on* the canvas, is one of the best practical explanations of the function of the picture-plane that could be given; it explains the whole thing at a glance. Excellent also is the explanation, further on, of the method in which positions of objects above or below the eye affect their leading lines. The simple geometrical problems of perspective are illustrated later on in the book, always in a very intelligent and sensible manner, and without any unnecessary lines; indeed in one case the author gives a problem (fig. 103), the outline perspective of a house, with all the working lines scored over it, for the express purpose of showing, as he says, "how these lines tend to obliterate the picture and confuse the student"; a piece of commonsense which one wishes that one could meet with more often in perspective books. Just as many of these might be called "perspective made difficult," Mr. Hatton's book deserves, we think, to be called "perspective made easy." It is an eminently commonsense book, and may be recommended as such for the teaching of beginners.

With Signor Giampietri's essay we come again to what we suppose must be called the higher theoretical levels of perspective, though he specially calls it "practical perspective."* It is unfortunate that in printing this the plates have not been extended on long pages so as to open out beyond the letterpress pages; they are bound at the end of the letterpress, with the consequence that one can only follow out the author's elaborate diagrams and argument by constantly turning the pages from the text to the illustration, as it is impossible to see both at once. The author's own practical mastery of perspective is attested, as the frequenters of our water-colour exhibitions know, by numerous fine and masterly drawings of architectural subjects. Signor Giampietri's object is to do away with the necessity of plan or elevation of the object to be drawn, and to work out the whole operation within the space of the paper or canvas, "if to the right and left of the paper or canvas two laths, or similar appliances, be fixed at the height of the horizontal line, to carry those points to which certain lines tend." His method seems in one sense to fall in with the remark made in our first paragraph, that any one who can find the perspective position of two points in relation to each other can put anything into perspective. But so far as we have had time to follow out his system (with the before-mentioned hindrance from the awkward way in which the book is made up), he certainly appears to have complicated rather than simplified the problem of perspective, and in his desire to avoid the necessity of a plan he has formulated a system much more lengthy and complicated, and requiring a great many more lines, than the system of projecting from a geometrical plan. His work is in fact a very interesting study in geometrical problems, and may interest many readers as a piece of geometrical reasoning, but we can hardly regard it as essentially or specially practical.

* "Perspective for Art Students." By Richard G. Hatton. London: Chapman & Hall; 1902.

* "A New System of Practical Perspective for Artists and Architects." By Cav. Settimio Giampietri. Institute of Architects' *Journal*.

WORKMEN'S COMPENSATION ACT AMENDMENT BILLS.

TWO Bills entitled Workmen's Compensation Act Amendment Bills are at present before the House of Commons, numbered respectively No. 2 and No. 3. They should also be entitled "extension" Bills, as either Bill would extend the operation of the Act. No. 2 Bill applies the principal Act to "employment of every kind in which any person is engaged in the United Kingdom or on a British ship," which would include clerks, shop-hands, domestic servants, or any one with an employer. Bill No. 3 is not so explicit. The expression "workmen" is used in speaking of those entitled to compensation, and "workman" is defined in much the same terms as in the principal Act, but without the limitation, "engaged in an employment to which this Act applies," which occurs in Section 7 of the principal Act.

An exhaustive review of either measure would not be appropriate to these columns, but we would draw attention to one or two of their provisions which would especially affect the building trades, in common with employments at large.

Bill 3 puts forward an entirely new principle, giving "undertakers" who pay rents or royalties to owners of real property upon which an industry is carried on the right

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of claiming from such landlords a contribution of one-fourth of any compensation they may have to pay. As the clause is drawn this only applies to such undertakers under the principal Act, and not to all employers under the amending Act. Clause 3 of this Bill also abolishes the defence of contributory negligence under the principal Act. This seems superfluous, as such a defence is not available; the clause, however, proceeds, "or any other defence in such proceedings," which seems directed to do away with the defence of serious and wilful misconduct, which is the only defence at present available arising out of the conduct of the workman himself. Clause 5 also abolishes the defence of "common employment," *i.e.*, negligence on the part of a fellow servant, "under this or any other Act," notwithstanding any contract to the contrary. This defence is not at present available in the absence of contract, either under the Workmen's Compensation Act or the Employers' Liability Act; and, as Clause 4 makes contracting out of the Workmen's Compensation Act before the accrual of the right no defence, this clause seems also to a great extent unnecessary. Bill 2 deals with this question in a more intelligible manner, making the Workmen's Compensation Act apply, notwithstanding any contract to the contrary made before or after the Bill becomes law. The reason for such a clause is apparent, as Section 9 of the principal Act only appears to void contracts existing at the time that Act came into operation.

Both Bills are directed to making compensation payable from the time of the accident, and not two weeks after, as the law now stands, in cases of incapacity.

The scale of compensation is dealt with in both Bills. Bill 3 makes the same compensation recoverable whether the workman leaves dependants wholly or only partially dependent on him, and provides that where a man has been employed less than three years, whose death results from the accident, or less than twelve months when incapacitated, his average weekly earnings are to be calculated as six times his average daily wages.

Bill 2 adopts the same principle of calculating average weekly earnings where any man has been employed less than two weeks by the same employer, but further provides, where the employment has been for one day only, that six times his earnings or agreed wages, whichever is higher, are to be deemed his average weekly earnings. This provision would still leave the case of a man only employed part of a day in doubt, and both Bills appear subject to the objection on principle that they unduly favour men only casually employed, since the man in regular employ can rarely claim six clear days a week on full pay.

Clause 6 of Bill 2 removes the present limit of 1*l.* for any weekly payment to men incapacitated, and in cases of permanent disablement fixes a minimum of 10s.

Of the two measures Bill 2 seems to us the most practical, but both measures are liable to serious legal objections; and as the working of the principal Act is now at last becoming understood, we think the Government is wise in itself introducing no amending measure at present, although such a step will later become necessary to remove several well-known defects and hardships.

NOTES.

The Education Bill. It is evident that the interest of the general public in the Education Bill is fixed chiefly on the question of primary education and the proposed absorption of voluntary and Board schools by the Committees of the County Councils. Secondary and technical education seem likely to be overlooked in the excitement of a contest between Churchmen and Nonconformists over the control of the primary schools. As we recently pointed out, there already exists a fair system of primary education in England, and what is necessary to be now established is a system of technical and secondary education. That should be the work of the Government during the present session; but if they insist on pressing on the portion of the Bill relating to primary education, it is not only extremely probable that the whole Bill will be lost, but an atmosphere of conflict will also gather around the appointment of the Educational Committees both for secondary and technical instruction. Religion has absolutely nothing to do with technical education, and it would be lamentable if from one end of England to the other persons were elected to the new Committees not because of their fitness for managing technical and secondary colleges and institutions, but because they were Wesleyans or High Churchmen.

Stonehenge. The decision of the Wilts County Council as to the enclosure of Stonehenge is naturally being awaited with a good deal of interest. We hope, however, that the legal proceedings which the *Times* seems to suggest will not arise. Sir Edmund Antrobus has enclosed Stonehenge by a wire fence, and the question before the Wilts County Council is whether the public have a right of access to this historic monument. It is quite clear that Stonehenge should be taken charge of by public authority, and we cannot believe that a private owner, if judiciously approached, would the least object to hand it over to the public. It is of no private value, and if the right of the public to the place is legally established it may very well result in all sorts of people damaging the stones unless the County Council can also claim possession of the monument; for the right of access does not, of course, include the right of public protection, and the place will still remain private property unless some amicable arrangement can be arrived at between the Council and the present owner.

Contract Conditions. In settling the general clauses of a specification reliance is too frequently placed upon forms which have served for previous contracts. Although no trouble may previously have arisen, it is not safe to assume that immunity is secured, as the following case may demonstrate. In the specification used by a well-known architect in connexion with an important building contract one clause apparently reserved to the architect the right of dealing with all provisional amounts as he might think fit. Similar wording had been employed in several specifications of a like nature, and a feeling of security was thereby engendered. Hence, when the proper time arrived the architect proceeded to issue instructions for the preparation of materials and appliances involving outlay to the value of some thousands of pounds. The building contractor and the firms concerned were equally satisfied in their own minds as to the meaning of the clause in question, but the proprietors suddenly interposed with a claim to decide for themselves as to the disposal of all provisional sums, refusing to recognise all instructions given by the architect. Legal opinion was taken on both sides, and it then appeared that the clause relied upon did not legally confer any power upon the architect unless with the previous consent of the proprietors. Matters then became somewhat unpleasant, and an interesting series of lawsuits at one time appeared to be imminent, but ultimately all differences were amicably adjusted. The example to which we have referred clearly indicates the desirability of looking with caution upon forms of expression whose actual value has not been ascertained with certainty.

Recovery of Expenses from Sanitary Authorities. The case of "Proctor *v.* Mayor, &c., of Islington" (*Times*, April 10) raises an interesting question. The drainage of one of two houses being defective, the lessee received a notice of the fact from the Sanitary Authority. The lessee proceeded to carry out the work, but in the course of the repair it was discovered that one drain received the drainage of both houses, which the Sanitary Authority admitted constituted the drain or sewer for the repair of which they were liable. The notice served on the lessee seems merely to have been a notification of the defect under Section 3 of the Public Health (London) Act, 1891, and not an abatement order under Section 4, for non-compliance with which a penalty attaches. The lessee sued the Sanitary Authority to recover the money she had expended as money paid at their request, but Mr. Justice Wright held that she had not acted under such compulsion as to enable her to recover. If the notice had been an abatement notice under Section 4, on the authority of the case "Andrew *v.* St. Olave's Board of Works" it appears that the plaintiff could have recovered both by virtue of Section 11 of the Act, whether she was compelled to do the work or not, and at common law as having been compelled to do what the defendants were legally compellable to do. As regards this latter point, however, a defence was suggested by the Court in the case of "Self *v.* Hove Commissioners" that sanitary authorities were not deemed to be under such compulsion to do work when under their statutory powers. They can throw the liability on some one else, but the case was eventually decided on other grounds.

The Drainage of Falmouth. It is odd to note how unbusinesslike business men often are in regard to sanitary matters, when they are acting in a public capacity. At the present time the Local Government Board insists that there shall be a new system for the disposal of the sewage of Falmouth, and the Corporation is rather like a horse which will not take the fence in front of it. The last step which has just been taken by the Corporation is to empower the surveyor of the borough to prepare plans, so as to avoid the expenditure which is apparently required in order to carry out a really ex-

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tensive scheme. Men of business, in conducting their own affairs, would certainly not act in such a near-sighted way. Efficient sanitary plans require to be worked out by an engineer of experience, and plans by an amateur made in order to save money are almost certain to be rejected by the experts who advise the Local Government Board. Moreover, in carrying out any plan for sewage schemes in a growing town such as Falmouth, or, indeed, in any similar case, it is desirable not only to consider the needs of the present but of the future. For if a plan is carried out which is only sufficient for immediate needs, in a few years' time it may have to be enlarged at a much greater expense to the ratepayers than if a more extensive design had been carried into execution in the first instance. Where a place is both a harbour and seaside resort a thorough system of sewage disposal is especially essential; and it is absurd to argue that, because a place is healthy at the present time, therefore improvements are not needed, since the very object of them should be to prevent any deterioration in the sanitary condition of the town.

A Concrete Factory Building.

A FACTORY building, five stories high and occupying a site of 50 ft. by 25 ft., has recently been completed in Jersey City, having the foundations, walls, floor beams, girders, and roof made entirely of armoured concrete. The building contains about 500 yards of Portland cement concrete, and 12 tons of twisted steel rods, varying from ¼ in. to 1 in. square. The ground floor is supported about 5 ft. above ground level on foundation walls with expanded bases of sufficient area to reduce the pressure on the unstable soil to 2,000 lbs. per square foot. All the floors are designed for loads of 250 lbs. per square foot, and each consists of a continuous concrete slab, 4 in. thick in the case of the ground floor, and 2½ in. thick in all other floors, finished with a ½ in. granolithic surface. The floor joists on the ground floor are of steel-concrete, 26 in. from centre to centre, and measure 4 in. wide by 20 in. deep. They are flush with and supported by beams of similar material and depth, but 6 in. wide, each made in two lengths, so as to provide for expansion. On the upper floors the joists and beams are of lighter construction, and flanges are moulded on the lower edges of the joists to carry wooden beams, to which hangers for shafting may readily be secured. Twisted steel rods are carried through all concrete work, and the lower portions of the joists and beams are strongly reinforced in this manner for withstanding tensile stress. The steel rods are joined together by means of sleeve-nuts, and so continuity of support is secured. This factory building is interesting as an example of concrete construction, but the adoption of concrete joists and beams seems to offer little advantage, while the great depth of such members would frequently be a distinct drawback.

Fire-tests on Hardwood Doors.

WE have received from the British Fire-prevention Committee the official Reports (Nos. 68 and 70 of the Committee's publications) of two sets of fire-tests on doors made of Jarrah and Karri wood; one of each in each test. The tests were for resistance to a fierce fire of one hour, rising to a temperature of 2,000 deg. Fahr. In No. 68 the doors were each 1¾ in. framed with 1¾ in. solid panels. In No. 70 the doors were 2 in. four-panelled doors, bead flush both sides. In both cases therefore the panels were the same thickness as the stiles, but in No. 68 the panels and stiles were jointed with a separate slip piece mortised into both, in No. 70 they were jointed with a tenon worked solid out of the panel. The results in the two tests do not seem to have differed much, and they did not tend to show that doors of these thicknesses, even in these hard woods, could be depended on for long in a fire, though the results are no doubt better than with doors of softer woods. In No. 68 test there does not seem to have been any noteworthy difference in the resisting power of the two woods; but in No. 70 test it is noted that at the close of the test the Jarrah was still standing, while the Karri door was practically destroyed. The Committee intend to have some more tests with doors made of these Australian woods. It would be interesting to see what would be the result of tests with solid 3-in. cross-barred doors, made with as few joints as possible.

Liverpool Architectural Society.

THE annual Report of the Liverpool Architectural Society records that the fifty-fourth session (1901-2) has been marked by the Incorporation of the Society, the official title of which is now "The Liverpool Architectural Society (Incorporated)." The Council made an effort for the omission of the awkward addition of the last word, but it appears that the Board of Trade insisted on it. We quote the following paragraph from the Report, in regard to the Liverpool Cathedral question:—

"The year has witnessed the second attempt to provide Liverpool with a Cathedral. During the spring of 1901 it was rumoured that a committee of prominent Churchmen, who were investigating the advantages of the various sites, had decided on the blunted triangle known as Monument-place; but to the surprise of nearly all architects, it was announced that they had selected St. James Mount. The Council took immediate steps to protest; they drafted a report which was adopted by the Society at a special meeting and sent to the Press and the members of the Cathedral Committee. Owing to unforeseen circumstances no protest could be made at the public meeting held in the Town Hall, on June 17, when the choice of St. James site was ratified. The Council, although deeply regretting the decision of the meeting, has taken no further steps to oppose what was evidently the wish of the majority of those outside the profession."

We expect that the cathedral, if built at all, will now be built on the architecturally unsuitable site that has been selected; but we are none the less of opinion that it is a mistake, and that this will be admitted when, probably, it is too late to remedy it.

A Restored Fountain in Rome.

ONE of the latest additions to the restored monuments of the Eternal City is an elegantly designed fountain in the somewhat cold classic style of the eighteenth century, by Carlo Fontana, the architect who did so much to transform the work of Bernini at the old Pontifical palace of Montecitorio. This fountain has a certain originality. It consists of the usual arrangement of vases one within another, with an upward shooting jet of water, within a severely outlined frontispiece—an archway in the Roman Doric order against an otherwise blank wall—above which is placed one of the usual inscriptions surmounted by the Papal arms of the period. The whole forms a pleasing courtyard design in a crowded city, and suggests the usual Roman design for such monuments which culminates in the celebrated Trevi fountain. The fountain is situated in an inner court of the present Italian Houses of Parliament, where a formerly dusty and uninteresting *cour d'honneur* has been turned into a luxuriant garden with this agreeable feature in the midst.

Messrs. Tooth & Sons' Gallery.

AT the Spring Exhibition at Messrs. Tooth & Son's Gallery in the Haymarket a special feature is made of a collection of landscapes by Mr. David Farquharson, which occupy the small outer gallery. These are mostly of Scotch scenery, and are very good, broad in style and full of powerful open-air effect. Among the most striking are "Golden Autumn, Glen Falloch" and "Summer Showers, Ben Venue." In the main exhibition in the large room the central work is a sacred picture by M. Dagnan-Bouveret "Madone," a rather curious medley of a visionary Madonna with realistic surroundings; the face and the general pose of mother and infant are very pleasing, but the picture as a whole is a rather bewildering conception. Among the other works are a fine though small sunset scene by M. Harpignies, "Site d'Italie"; a specimen of M. Gérôme (41) not quite at his best; a fine Meissonier, "Les Bons Amis"; a characteristic piece of bluster by M. Roybet—the modern Frank Hals, as he may be called; a beautiful little landscape of the highest finish, "Midday" (71), by Mr. H. W. B. Davis; two or three good Dutch *genre* and family scenes by Herr Neuhys; a couple of Mr. Blinks's inimitable dogs; and several brilliant little works by M. Gallegos, among which "Seeking New Mission Fields" is remarkable for point and humour as well as for finished execution.

Mr. McLean's Gallery.

AT Mr. McLean's Exhibition in the Haymarket there is to be seen what may be called a typical work of M. Bouguereau's (for those who like that kind of type), "The First Kiss," exchanged between two of the artist's charming child figures—the classical, not the rustic, variety—perfect in design and drawing and delicate in colour. As a type of the supremely pretty in art no one could surpass it. By M. Roybet there is "A Dutch Burgomaster," obviously painted from the same model as the "Standard-bearer" in the next-door gallery. M. Léon Lhermitte's "Gleaners" is a powerful landscape in his severe and uncompromising style. Beyond these there are no works in the large room that are of the first order of interest; Mr. Hurt's imitation of Mr. Peter Graham—"A Showery Day—A Glen near Inveroran," is very successful in that sense; but then Mr. Graham did it first. The best part of the exhibition is in the small outer room, where there is a fine example of Diaz, and examples of the work of M. Jacque, Mr. Fritz Thaulow, and M. Harpignies, who is represented among other things by a large gloomy brown picture, "The Long Rocks in

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the Forest of Fontainebleau," which has a power of its own in a somewhat depressing way.

Mr. Wallace Rimington's Exhibition.

AT the Gallery of the Society of Fine Arts there is on view a collection of water-colours by Mr. Wallace Rimington, under the title, "England and Spain, Contrasted in Landscape and Architecture." This is an interesting programme for an exhibition, and has been very well carried out in a series of drawings which are noteworthy both for landscape effect and for the treatment of the buildings. Some piquant contrasts are arranged in the hanging; the rich and florid architecture of the "Cloisters, Pamplona Cathedral," for instance, hanging above a representation of the sober dulness of the tower of "St. Mary of the Steps, Exeter," and other similar contrasts may be noticed. "Exeter from the Canal" (25) is an admirable work; so is "A Patio in Zaragoza" (23); and many others might be named. The collection is well worth a visit.

Charles Kean's Scenery.

WE learn that a collection of drawings illustrating the scenic effects in the Shakespearian revivals and other plays produced by Charles Kean during the years 1851 to 1859, has been presented to the Victoria and Albert Museum by Mrs. F. M. Paget, a niece of Mrs. Charles Kean, and will shortly be on view in the museum. The drawings were made for Charles Kean by his principal scenic artists, Messrs. Telbin, Grieve, Cuthbert, Gordon, and F. Lloyds, as records of the plays. It will be of some interest to see how these designs will compare with some of the recent remarkable efforts in scenic mounting. In regard to the architectural details of his Shakespearian scenes Kean was, we believe, much assisted by the late Mr. George Godwin, the former editor of this journal.

ABBEY DORE.

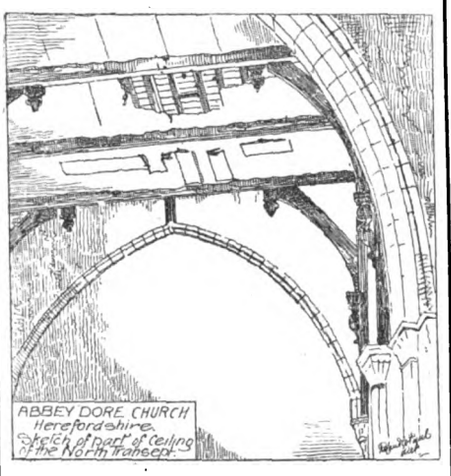
APPEALS are being made for funds for the further repair of the celebrated and interesting church of Abbey Dore, the only Cistercian Presbytery in England still used for public worship. The work is under the charge of Mr. Roland W. Paul, who knows the building probably better than any one else, and whose name is a guarantee that nothing will be attempted in the way of "restoration" in the objectionable sense of the word. But the fact that the church is in modern use for service of course emphasises the necessity for keeping it in repair.

The work which was absolutely necessary has been divided into the following sections: (i.) The Tower, (ii.) The Roofs and Ceilings, (iii.) The Main Fabric, Porch, and Glazing, (iv.) The Floors and Drainage. Tenders were invited for the whole work, and that of Messrs. Collins & Godfrey, of Tewkesbury, was accepted. The amount is 4,395*l.* By September last the Committee had raised 1,429*l.*, and decided to proceed at once with sections (i.) and (iv.) at a cost of 1,180*l.*, as the state of the building rendered immediate attention imperative.

These parts should be completed in the course of the next two or three months, and it is obviously most desirable for the safety of the fabric that the roofs and ceilings should be attended to without delay. The plaster has been falling for some time past, and the defects in the stone tile roof above are constantly aggravating the mischief. Abbey Dore is a poor agricultural parish, and without help from outside the parish it will be impossible to save the church from ruin.

The following is the architect's Report on the work up to the present time:—

"*Section 1.—The Tower.*—On carefully examining the Tower, I found that it would be unnecessary to take down anything below the string course of the embattled parapet. The parapet itself on being taken down has proved to be partly composed of worked stones taken by the builders of 1633 from the ruins of the church, and in two instances interesting inscriptions were found recording the names of benefactors to the church, of thirteenth century date. These stones have been carefully preserved. The parapet is, generally speaking, in good condition, and but few new stones will be required. The string course below, however, is much worn. The old stone tile roof has been removed, and the timbers of the roof were found to be very much decayed. A temporary roof has been erected pending the completion of the new roof, which will be of low pitch and covered with lead, with the old rod and vane refixed.



Section IV.—The Floor and Drainage.—The work in connexion with this section has brought to light a great many interesting details of the old monastic church. At the time the paving was laid down by Viscount Scudamore in 1634, the accumulated soil was evidently only roughly levelled to receive it. On this paving being taken up, a great quantity of loose earth, stones, bones, and skulls were found, and also much of the encaustic tile pavement and painted grisaille glass of the thirteenth and fourteenth century. In nearly every part of the church the ancient levels were found, and in relaying the pavement these old levels have been followed. In one or two instances the walls have sunk considerably, owing to the great weight of the tower erected by Scudamore at the junction of the presbytery and south transept, and here the paving has been stopped so as to expose the original levels. The graves, where found, have been filled in with lime concrete, and the paving, set in cement, has been laid on a bed of concrete not less than 6 in. in depth, and in many places of greater thickness. The old paving has been re-used and all the inscribed stones relaid.

The recovery of the old levels has also exposed th foundations of three out of the five altars that stood in the chapels of the ambulatory behind the sacrarium and the foundations of the screen walls that divided the chapels from one another. In this part of the church were four holes about 4 ft. square, in which were found worked stones, among them being fragments of an aumbrey and piscina. In the north aisle a very delicately carved stone, probably the angle of a canopy of a tomb, was found, and some shafts and bases belonging to the same. Fragments of one of the incomplete effigies at the east end were also discovered.

The encaustic tile paving is of three kinds. (1.) Tiles having shields of arms of families, local and otherwise. (2.) Embossed tiles of diamond shape, mostly with a green glaze. (3.) Conventional foliage patterns; and (4) tiles with inscriptions, one bearing the name of the maker, Martin. Besides these are a great number of plain tiles with good green, yellow, brown, and black glaze. These tiles are probably of the latter part of the thirteenth and early fourteenth centuries.

The painted grisaille glass was found in considerable quantities in the north aisle and north transept, and some of it still retains the conventional designs that were characteristic of glass of this date. Much of it will, I hope, prove to be in sufficiently sound condition for use in some of the windows.

On the exterior the accumulated soil on the north and west sides is being removed. The south walls had been partly cleared a few years ago, but the earth remained for a depth of 3 ft. on the north side, and nearly 6 ft. on the west. A good many fragments of worked stone and encaustic tiles have been found, but the work is still incomplete, and the results will be given in a later report.

The work included in the present sections will in all probability be completed early in the coming spring, and I wish again to draw the attention of the Committee to the dangerous condition of the plaster ceilings and the roofs generally. My original report described the bad state in which I found them, and as time goes on their condition does not, of course, improve. The spring and summer will afford an excellent opportunity of dealing with this really urgent work, and if the remaining sections can be taken in hand before or at the completion of the present ones, there will be no necessity for removing the plant or stopping the works in any way, a matter which I need hardly point out is a most important one in work of this kind.

ROLAND W. PAUL."

The accompanying illustration, from a sketch made by the architect, shows better than words how much some portions of the church are in need of immediate repair.

THE ARCHITECTURAL ASSOCIATION.

A SPECIAL meeting of the Architectural Association was held on Friday, last week, in the Meeting room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, Mr. E. Guy Dawber, vice-president, presiding.

The Chairman said the meeting had been called for the purpose of considering the following alterations and additions to the by-laws:—By-law 26: Substitute the words "First ordinary general meeting" in place of "Annual general meeting." By-law 30: Omit the words "Hon. Auditors." Omit by-law 36. By-law 42 to read: "42. The first general meeting during each session shall be the annual general meeting for that session, and at such meeting the prizes shall be distributed, the president shall deliver an address, and short addresses shall be invited from senior members of the profession. At the first ordinary general meeting each session a statement of the accounts of the Association duly audited by a professional accountant shall be laid before the members."

The Chairman said that, on behalf of the committee, he moved that the above proposals be agreed to.

Mr. R. S. Balfour, hon. secretary, seconded, and the motion was agreed to.

The ordinary fortnightly meeting was subsequently held.

The minutes and nominations having been read, Messrs. H. C. W. Dod and J. A. Maxwell-Stirling were elected members.

On the motion of Mr. H. P. G. Maule, hon. secretary, a vote of thanks was accorded to Mr. Dixon Butler for allowing a party of members to visit the Cannon-row Police-station on the 22nd ult.

New Premises Fund.

The Chairman said that the following additional donations to the New Premises Fund had been received, *i.e.*, The Worshipful Company of Clothworkers, 50*l.*; Messrs. J. T. Christopher, 10*l.* 10s.; C. Harrison Townsend, 10*l.* 10s.; Louis Ambler, 5*l.* 5s; A. M. Torrance, 5*l.* 5s.; C. F. Longden, 5*l.*; H. Longden, 5*l.*; F. Lishman, 3*l.*; R. W. Collier, 2*l.* 2s.: C. Dunch, 2*l.* 2s.; E. W. Lees, 2*l.* 2s.; A. W. Papworth, 2*l.* 2s.; and J. D. Slater, 1*l.* 1s. The total amount so far received amounts to 4,042*l.*

On the motion of the Chairman a hearty vote of thanks was accorded to the Worshipful Company of Clothworkers for their donation.

The Chairman announced that the Elementary Water-colour class had commenced and that as there were several vacancies, the secretary would be glad to have the names of members who wished to join.

He also announced that the Day School Summer term would commence on April 14, the Sketching and Measuring Class on April 15, and the Plane and Solid Geometry Class on the 24th inst.

Mr. Balfour announced the following donations to the Library:—"Gas and Gas Fittings," *Builder* Student Series, presented by the publishers; "Suggestions as to the Planning of Poor Law Buildings," by P. Gordon Smith, presented by the publishers, Messrs. Knight & Co.

The House List.

The Chairman read the House List, as follows:—

President, Mr. H. T. Hare.

Vice-Presidents, Messrs. W. A. Pite and L. Ambler.

Committee: Messrs. F. D. Clapham, Hon. A. McGarel Hogg, Arnold Mitchell, G. H. F. Prynne, W. H. Raffles, A. B. Thomas, H. Tanner, jun., F. C. Elder, R. H. Weymouth, E. H. Sim, E. Guy Dawber, G. B. Carvill, W. H. Seth-Smith, and W. J. Tapper.

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Hon. Librarian, Mr. J. MacLaren Ross.
Hon. Treasurer, Mr. Francis Hooper.
Hon. Secretaries: Messrs. R. S. Balfour and H. P. G. Maule.
Hon. Solicitor, Mr. W. H. Jamieson.
Hon. Assistant Librarians: Messrs. W. A. S. Pettit and G. H. Lovegrove.

The Chairman said that the gentlemen whose names he had read would be nominated at the next meeting, when any two members would be entitled to make additional nominations.

The Preservation of Ancient Buildings.

Mr. W. D. Caröe then read the following paper:—

I fear my selection may be of too antiquated and archæological a subject to interest the very latter-day architect who works in up-to-date styles, and who is apt to be indoctrinated with the view that in architecture archæology has no proper place, but is merely a curb upon his rational (or irrational) imaginings.

I confess that I approach my task with some misgiving, but if I have seemed to you on your first thought to be asking your attention to only the dry bones of architecture, I shall do my best to suggest to you—certainly by inference if not directly—that these are no dry bones at all, but that there lies within the scope of what we are about to consider many a pungent thought for each of us; and that as there is no more difficult, thorny, and responsible branch of our many-sided calling, so there is none more absorbing or interesting if approached in the true spirit, or more valuable in its object lessons and training.

To the man of sympathy and imagination it is a real delight to watch the history of an ancient building unfold itself little by little—to discover that the greater his learning, just so much the more will it whisper to him its secrets. True it is that much knowledge and more imagination are needed to invest this branch of our craft with its full significance; equally true also that imagination must not be permitted to outstrip knowledge. We owe much of ever fresh interest to the realisation, late in the centuries though it has come to us, that in every piece of wrought stone or wood, almost in every brick, may be hidden some definite history of the past, of its art or lack of it; some tale of the manner of men our forbears were, at any period, in any locality. Without this knowledge, derived from man's handiwork, history may be—has been—written awry. With it, evidences derived from documents acquire a double value. The two sources are mutually reflexive—taken together may become luminous. And it is part of our business as architects, to *preserve* this one, which is complimentary to the written record. It has come to be recognised all too late that such preservation is a deep and difficult science, which is undermined with pitfalls.

My endeavour shall be to crystallise its somewhat indeterminate ethics into a form which, I would fain hope, may be helpful in our practice.

The Lamp of Memory shines brightest when trimmed and lighted by John Ruskin, whose eloquent essay I commend to all, both those who have studied it in youth and perhaps put it by upon the shelf, and also our younger friends who come with freshness and enthusiasm to an absorbing subject. Such winged words as these will not weary you in the repetition. Speaking of memory, he says:—

"Seven Lamps," p. 178: "It is as the centralisation and protectress of this sacred influence that architecture is to be regarded by us with the most serious thought. We may live without her and worship without her, but we cannot remember without her."

Or again: "If there is any joy in the thought of being remembered hereafter which can give strength to present exertion, or patience to present endurance, there are two duties respecting national architecture whose importance it is impossible to overrate—the first, to render the architecture of the day historical; and the second, to preserve as its most precious of inheritances, that of past ages."

Again: "We, as we live and work, are to be always thinking of those who are to come after us; that what we do may be serviceable as far as we can make it for them as well as for ourselves. Then, when we die, it is the duty of those who come after us to accept this work of ours with thanks and remembrance, not thrusting it aside or tearing it down the moment they think they have no use for it."

Such only is the spirit in which we must seize upon our difficult task. The semblance of any other, and, above all, any lurking suspicion of lucre, and the word may be passed at once that we are not fit for it. Here, then, we have the very marrow of the subject in the words of a master of impressive language. Restoration, Reparation, Preservation, Protection, call it what you will, this is our task and none other, to save the past for the future, to hand down intact, if may be, to posterity, what has been bequeathed to us.

Now, I have already indicated that the subject is, as the centuries go, a new one. In Ruskin's sense, in the sense in which (I hope) it appeals to us all, it was to the ancients quite unknown—except in relation to literature. As to our Mediæval forefathers, although there are a few definite instances where ancient work was preserved, either for its sanctity, or for practical reasons, or for glorification, they were, as you all know, the most impenitent sinners. They implicitly believed—and, generally, not without good reason—in their ability at any moment to do something better than what they found, however beautiful.

The eighth Henry's respect for antiquity I need not call to your mind; and yet the very destruction wrought by him and his assassins seems, through reaction, to have sown the seeds of a reverence, which, fructified again by the depredations of Oliver Cromwell and his Puritans, became first a feeble sapling, but in these latter days has grown strong (I will not say quite healthy), and appeals more or less sentimentally to most men of culture and attainment. It has, in fact, become a cult, or, indeed, two cults. The one of Restoration, which, in the honest hopes of preservation or revival, has—unwittingly, no doubt, but no less ignorantly and ruthlessly—destroyed; the other of Preservation, which has, again by the force of reaction, become a fetish—a species of fanaticism—often so wanton and uncontrolled as to set men's faces against a great and good cause, at times inventive of schemes silly-seeming to the man of plain sense.

The Cambridge Camden Society did much to foster those principles of restoration which consist mainly in the would-be recovery of more ancient forms at the expense of later. Sir Gilbert Scott enunciated some wise principles in his eloquent and touching appeal for conservative restoration, and abjured the same principles steadfastly upon the many occasions when our greatest historical buildings fell into his hands—not do I think for one moment consciously or wilfully. But one of the first warnings in carrying out this fascinating work in actual practice will be to work steadfastly upon the curb. As years advance, and opportunities increase, it becomes more and more imperative to draw the rein tighter. The temptation to attempt the reconstruction of the past—restoration, instead of preservation—can grow like a fungus, as it did with Scott, and plunged a great and deserved reputation in the dust.

We may take another warning from our neighbours abroad. In France and Germany, and in Italy also (although there the fortunately growing influence of Signor Commendatore Boni has helped to stay the regrettable practices in vogue), the idea that the past may be preserved by its wholesale destruction, and the reconstruction in its place of the would-be past most pleasing to the fancy of the reconstructor, and the tendency to depreciate the less in favour of the more interesting history, and to sacrifice the evidences of the one in favour of the other, have gone far to wipe off the slate the great historical buildings as such. They have in the process been largely transferred to the pages of erudite monographs, the actual buildings having become cast-iron echoes of themselves.

Viollet-le-Duc deliberately sets before himself the goal of recovering the supposed form of a building at that precise period of its existence which he pedantically elects to be the most beautiful or most interesting or both. All the overlying evidences of other periods are to give way; and when those evidences sought are not found, they may be manufactured in the form in which the eminent professor thinks, in his erudition, most probable and harmonious.

This phase has its roots in a species of unholy pride, the refusal to acknowledge that any past century could do work as good as, or better than, the present.

I can give no better illustration than the reconstruction of Leon Cathedral in Spain. The façades, our guide-book tells us with satisfaction, "have been purged of their Renaissance disfigurements." Observe the inanity of the "Gothic" which has taken their place, although it is fair to say that under the direction of Señor Madrazo, the architect, some clever under-building has been accomplished to the arcades and other parts which were seriously jeopardised by the great Lisbon earthquake and subsequent neglect. But there is great prodigality of new stone in all these works.

The restoration of the walls of Carcassonne, upon which, under Le-Duc, the French Government has wasted untold thousands, and aided by which Le-Duc was able to lay before us with a scholarly intuition and definiteness worthy of all praise, the history and science of Romanesque and Mediæval fortification, forms a striking, not to say ludicrous, example of the failure of the method, even in erudite hands. The further works now in progress in which Le-Duc's methods are being carried forward, are really more comical than words can express. One is indeed tempted to ask if these men are quite sane. All over Europe works of a similar kind have been during the last thirty years, and still are, in active progress, and yet the modern spirit of a newly emancipated continent is such that these gross misprisions of antiquity are warmly approved, and mediæval travesties are too often regarded as glorious national monuments.

If I am asked for examples, they occur in every town, almost in every village. Augoulême, with hardly an ancient stone left undisturbed; Leon largely rebuilt; Upsala a modern building; St. Mark's, Venice, externally an engineer's construction; S. Front, Perigueux, with the bottom knocked out of its remarkable history; Albi restored, and now being re-restored apparently for the sole cause that the French Government does not know what to do with its wealth; that marvellous courtyard of St. Gregorio, at Valladolid, wrecked and rebuilt, and all its wondrous carvings scraped up into soapy whiteness; the delightful sculpture of Wisby being recarved because the architect (he told me so himself) thinks they are archaic and the heads too big for the bodies, and that he can draw them better, brilliant draughtsman as he undoubtedly is; Trondhjem and Stavanger new cut, Frederiksborgslot restored by a brewer like unto a public bar. And in Germany! The restorations made in Germany are more appalling than words can tell. I know not where to begin or where to stop in referring to them.

I am not exempting our own country. We have suffered grievously—irrevocably—and not the least from the curious revivalist heresy that the art of architecture stopped short in the year of grace 1534. We are still suffering, but fortunately a sounder sense of proportion, which I am here to advocate to-night, the sense of preservation, is gradually making headway among us, and here and there some remnants are left to be saved almost at the eleventh hour, to show us and the future what has been wrecked under the hungry wave of restoration.

In passing, I refer to one other "grim" one-man school of destructive restoration, which is fortunately individual and unique—the brutal, ignorant, conceited, self-opinionated "school" of Lord Grimthorpe. It has been as much a disgrace to the century and the Church which permitted it, as to the man who has had the effrontery to direct and to pay for it. Silence is perhaps most meet where memory is pain.

Parallel with this, but unfortunately on a wider plane, is the rapid destruction of ancient monuments to make way for so-called modern improvements, a process for which I venture to think our successors will curse us pretty roundly. We witnessed only lately how our County Council, priding itself on its enlightenment and supporting a Committee for the registration of ancient monuments, nevertheless disgracefully destroyed one of the few remnants of the East End, that desert of modern dinginess. I refer to Tudor House, of course, which had to make way for an extra bit of asphalte.

But Preservation, too, has its extreme forms which, like all extremes, carry their dangers to a good cause; and in antithesis to the extreme continental practice of restoration, let us consider our own extreme cult of preservation, which carries something of fanaticism with it.

But I should like to make it quite clear that I am most fully in sympathy with the primary

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tenets of the Society for the Protection of Ancient Buildings. No one recognises more fully the need there was for some earnest and tenacious effort to stay the work of unreasoning and ruthless restoration, which has already (always with the very best intentions) destroyed so much of the choicest beauties and deepest interests we had been fortunate enough to inherit from our predecessors.

But agreeing thus heartily with the aims and tenets of the society, I must not be held to endorse all its methods. These seem not infrequently to be directed to defeat its best objects—sometimes by exaggeration—sometimes even by childishness of statement—sometimes by the use of language seemingly calculated to annoy (the Society is an adept in the use of pinpricks), too often by carelessness or error, which come ill from those who affect infallibility of judgment. It may be said, indeed, against the Society that while it is the only organised upholder of a much-needed propaganda, it not infrequently goes far to set those who might be and would be earnest supporters against the good cause, which many of us have a right to claim as our own, with an enthusiasm as deep as the Society's most ardent member.

Now, I commend the various advisatory leaflets issued by the Society, with special mention of Professor Church's recent admirable excursus upon wall paintings. They are generally sound and practical and instructive. But there will not be found very succinctly laid down the following somewhat inchoate and elusive principles which I have endeavoured to cull briefly from some examples executed and statements made by members of the Society :—

1. As a general axiom, an ancient building is to be considered as a gem in a glass case. To touch or disturb it in any manner whatever is an act of sacrilege (a sentiment with which I, for one, heartily concur).

2. Nevertheless, you may whitewash it to any extent. You may rake out the inside of the walls, and substitute blue brick for old core without stint. You may rebuild or finish an interior with blue bricks, or you may patch up cracks externally with blue bricks.

3. But you may not patch them up with the original material of which the wall is built. That is counterfeit.

4. When you come to tracery, however, you may repair that in stone, and make such a copy of the old as you may be capable of. That, somehow, is not counterfeit.

5. You must underpin on all possible occasions.

6. And just as you may use whitewash you may also use plaster. You may, indeed, "restore" ancient plaster in the fullest sense of the obnoxious word. In the eyes of the Society there is some special virtue in plaster as a mediæval building material, which claims for it a treatment more exacting than you might accord to highly wrought stone or timber, let us say.

7. Finally, the Society for the Protection of Ancient Buildings may advertise you and itself, or you may advertise the Society for the Protection of Ancient Buildings and yourself in the Press, or on quaintly lettered or ill-spelt tablets—if, that is, you are acting under its ægis.

8. But woe betide you if you attempt anything whatever in any direction in connexion with an old building without such imprimatur.

Here, then, I have briefly referred to the methods of the extreme schools on either side. The first is purely destructive, and is fraught with disaster to the true preservation of antiquity. It has given us mainly blight and December leaves. The second is apt to destroy in its strenuous endeavour to do otherwise than restore in the extreme sense in which it rightly believes the first destroys. It creates in place a reactive method, apt to impress itself in illogical fads, as for instance when it whitewashes Exeter Guildhall, and is quite ready, we have been informed, to whitewash Westminster Abbey. You must make what logic you can out of the precepts I have sketched for you above.

Now I believe that wisdom lies once more in the *Via Media*.

If the tower and spire of Salisbury Cathedral were to fall to-morrow (from which catastrophe we have lately been saved by a restoration in defiance of every precept of the S. P. A. B., but against which no word of criticism was breathed), will any one say that we should do wrong in rebuilding it on the old model, and all that it destroyed in its collapse? I certainly should recognise such a reconstruction as a legitimate "counterfeit." And if a whole, why not also a part? It is almost impossible to deceive the future by a makebelieve of the past; and if there be any fear, a recorded date will easily put that to right; and the better the old methods are understood and adopted and the old feeling expressed, the more harmonious and satisfactory will the effect be. Too many windy words have been wasted over so-called "counterfeits." Do we blame the Perpendicular builders of Westminster Abbey and accuse them of counterfeit because they imitated the Early Decorated style, and in some places very cleverly? Or do we call in question Mr. Micklethwaite's work, daily growing at the West End? It is, as I understand, a necessitous reproduction of ancient forms.

Now there is one skilful and many an unskilful way of treating each problem which comes before us, and there are many methods of preservation applicable only to individual instances. I can only here deal with the subject in its general aspect, and thus, there are two primary principles which govern all cases :—1. In an ancient building, not a stick nor a stone shall be moved if a reason—a sufficient reason—is forthcoming to keep it where and how we find it. 2. When the work is done, no modern workman's mark shall be seen wherever such can be avoided.

I do not mean to say that the condition of a building may not have been such—cumbered perhaps with a restoration of fifty years ago, or later—that even a transformation of internal appearance may not have been a necessity, but its ancient work will all look reverently ancient, although scarred perhaps by past inroads, not by ours; and there will be nothing new inserted for newness sake, so that the fervent antiquary on entering may feel that all is genuine and tells a true tale, and that such as is new is legitimately—necessarily—so, and such as is old untouched.

And what is the new to be? This is involved in the wider question, "How far is the ancient to give way to modern requirements?" Primarily the answer is, and this must be our third principle, "It is *not* to give way."

We can and must sometimes create *de novo* to suit modern needs. We can also in ancient work reveal, but much more easily can we destroy. We cannot create what the past has bequeathed. Touch it and it may be gone for ever. Thus our third principle is a vital one.

Nevertheless, common-sense interposes and says that a building whose life, so to speak, is active must be suited to the needs of the day, within reasonable bounds. But I would ask you to bear in mind steadfastly that the tendency of to-day is to do too much, and you will never err on the wrong side if in the matter of adaptation (I am not now speaking of stability) you do too little. You *cannot* preserve too much.

It may be convenient at this stage, after the mention of these three guiding principles, to subdivide the buildings with which we are called upon to deal into three classes :—

(1.) Ancient buildings which have continued in the use for which they were erected up to the present, and which it is desired to preserve for the same use. Cathedrals and churches chiefly, detached monuments, some mansions, and schools.

(2.) Ancient buildings which have gone out of use, but which it is desired to recover to their old use or adapt to a new one, or incorporate into the midst of new buildings. Old manor houses become farms, or farms become cottages, or ancient school buildings incorporated into a modern growth.

(3.) Ruins of ancient buildings which it is desired to preserve as ruins, and to prevent from further decay.

Now, while the same principles will govern in all divisions, the practice in each will vary somewhat. In applying them, let me recapitulate succinctly the three principles already enunciated :—

(1.) Nothing shall be touched which can be left alone.

(2.) We must efface our own work.

(3.) Ancient work shall not give way to modern needs.

These are primary precepts. Hardly in any case will it be possible, unfortunately, to fulfil them; but according to the measure of our success in doing so in our work will that work be itself successful.

A fourth general principle applicable to all cases has to be stated, although it goes as a matter of course.

(4.) Our first efforts will be directed to the building's stability.

A fifth will, perhaps, not be so generally accepted in regard to all three divisions; it is

(5.) The beauty of an ancient building is not to be marred by inharmonious accessories for any purpose whatever.

The proposal, for instance, once made to build great brick buttresses to prop up the west front of Peterborough Cathedral I regard as simply brutal and an insult to the designers of that remarkable work.

I cannot subscribe to Ruskin's precept, "Do not care about the unsightliness of the aid," although I admit its argumentative effectiveness.

The sixth and last general principle will be

(6.) In all cases ivy must be removed and destroyed.

Now let us deal with our three classes of buildings :—

1. Ancient buildings in active use.

I confine myself for the nonce to churches. Our third principle will be the most difficult to apply here; clearly its application will vary with individual cases, each one of which must be dealt with on its merits. I admit the difficulties, but would plead for the most stringent application of this principle. There are, unhappily, but few churches remaining in which modern needs have not been allowed to wipe out ancient evidences—very dear to us if we could only now recover them. Our efforts in these latter days will be often directed to restoring away the restorations of the last fifty years, as the late Archbishop of Canterbury once phrased it. But we are frequently called upon to adapt, and our general efforts should be directed to doing this without interfering with the original lines of the building. There are three points where we may be tempted to break the rule :—

(*a*) The levels of the floors, specially of the chancel floor.

(*b*) The provision of vestry accommodation.

(*c*) The disposition of the organ.

As regards (*a*) *Floor Levels*.—More frequently than is generally thought the chancel was not raised above the nave, and the mere desire to elevate the chancel should not be permitted to disturb the original proportions of the building.

The same must be said of the frequent wish to elevate the altar. This is specially unfortunate if there be a low-silled east window. Be persistent in resisting such importunities. The level of the piscina will generally be a good guide.

(*b*) *Vestries*.—Vestry accommodation is an undoubted need of these days. All I would do is to urge the finding of some space within the building which may be devoted, by screening or otherwise, to the purpose, if this be in any way possible, before committing yourself to extension. The tower space may frequently be successfully thus utilised. But if vestries have to be built, be most careful to choose a position in which the new work will not interfere with ancient points of interest or beauty of grouping. A detached building connected by a covered cloister may be better than an integral addition to the church.

(*c*) *Organ Space*.—The choice of organ space is the direst difficulty in an ancient edifice, and demands all our care. It must be confessed that the west-end position has musical difficulties in its working in connexion with our English requirement of a choir in the choir stalls. There are cases in which it is impracticable, absolutely. If it can be adopted musically without destroying a west window, then by all means adopt it. But we are asked frequently to throw out an organ place from the chancel, and I am bound to admit that there is sometimes no other possible alternative. It may be necessary to abrogate our second and third principles. But I would have the matter weighed many times before taking the step, and if there are any unique features in the part of the building you would destroy, refuse to do it. There is much room for the exercise of ingenuity in connexion with the disposition of the organ, and there are really many unexpected places which courage will suggest. At Stratford-on-Avon Mr. Bodley solved the problem by placing the instrument over the western arch of the central tower. It is full of interest, and certainly if ever removed the building will have suffered no harm. Where there are transepts our difficulties may be minimised, yet I know a

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case (at Clevedon Old Church) where the beautiful transept, wherein Arthur Hallam is commemorated, is absolutely ruined by a huge and blatant organ, set down regardless of surroundings. To block up the chancel, especially if it be narrow, with an instrument resting on the floor and projecting from the wall is fatal. Even in a great church the ill effect of this treatment is patent as in the restored Abbey of Dunblane or at Boston. It must be remembered that few of our churches were built for organs, and the best we can do is a makeshift. If our difficulties be great they are diminished by having to provide for a small instrument, and perseverance and tact are all I can prescribe, together with that resoluteness in defence of the old, which will carry weight with most of those who have charge of our ancient monuments.

To remove the organ from the organ screen, where such exists, in order to open out a vista or for any practical purpose, to take down the rood screen (and to remove it to the Vicarage Hall, as I have known done) in order to open out the chancel, to remove the interesting steps of a Norfolk font, because they occupied too much space, are types of deeds we mention only to deplore.

But to pass on to the wider question of structural stability. First of all, see to your foundations. Remarkable although their work was above ground, the Mediævalists were sorry scampers in the matter of foundations, and they seemed to exercise no forethought as to the weight they proposed to put upon them. It follows that underpinning is a frequent necessity. But remember that fissures may come from bad bedding or bad building above ground as well as from bad foundations. In towers, bell-ringing is a frequent cause, and if the wall be weak from any of these causes, and the underpinning unnecessary, you incur much risk and may do much damage by attempting it. I have been pressed to underpin the piers of a church by my friends the Society because they were an inch or two out of the upright, when they certainly had never moved for 500 years, and an examination showed their foundations to be excellent.

Towards such importunity my advice is to do nothing but look pleasant.

But having satisfied yourself about the foundations, the next thing is to repair the cracks and consolidate the core of the walls. I need hardly mention the utility of liquid grout in this connection, but must warn you not to use fresh cement. With a little care and skill grout may be employed so that no evidences of fracture need show. Reparation by blue bricks is pure faddism. Why, at the same and for all time, display our own lack of skill and a building's sore? But if you will do so, my advice is not to commemorate it by a tablet.

We have often to deal with leaning walls. The idea that a wall is dangerous or necessarily going to fall because it leans is an absolute, if popular, fallacy. The mechanics of the question are simple enough. Remove all lateral pressure and the wall will not fall until the line of the centre of gravity passes outside the base. If the wall be buttressed, there is a still greater angle of safety. Our deductions will therefore be:—

1. Remove lateral roof pressure.
2. Consolidate and if necessary spread your foundations.
3. Spread your buttresses, or add new ones on a homogeneous foundation.
4. Let rebuilding be your last resort.

The disturbance of an ancient work and its architectural features by taking down and rebuilding is almost irreparable. Of course it is frequently possible to set a wall upright by jacks, but the operation is costly, and demands the greatest care if the windows or other architectural features are dilapidated or fragile.

Let us pass to the repair of stonework. We are now upon debateable ground. A beautiful work of art has been erected out of a friable stone, or, perhaps, the pestiferous atmosphere created by modern civilisation has been brought to play upon a stone which would stand quite well in the purer air of barbarism. The decay wrought has very likely added to the beauty of the building by softening its hard edges and giving, sometimes that colour, sometimes that romance and glamour which are associated with weatherworn age. The building may, indeed, have reached the acme of its beauty; and yet the point may have been reached when disintegration will be rapid. A few years and the original touch of the mason's chisel will have vanished, together with all record of the contours he created. Is all record of these to be lost for ever to posterity? If the decay is such as to endanger the stability of the structure, is such renewal as may be necessary to take the form of the original, or must such imitative work be rigidly denied to us as a fraudulent proceeding?

The panacea for such decay as I have described, advocated by the Protection Society, is whitewash. The panacea of the restorer is, of course, wholesale reconstruction.

Now, a committee of chemical experts and architects has been sitting for a prolonged period in the endeavour to discover some process by which the unfortunate decay in the stonework of Westminster Abbey may be arrested.

Where such decay has taken place in stones, of which the chief constituent is carbonate of lime, and where the cause is the sulphurous emanations from the modern town atmosphere, which convert carbonate of lime into gypsum, a soluble substance, an arresting remedy has been found in Baryta-water (hydrate of Baryta). You may see the effect inside the chapter house, which has been dealt with under Professor Church's able direction. Unfortunately, in other places, where such a remedy was most needed, it proved a disappointment, and it is evident that it can be used only with the greatest circumspection. But the committee's report will be awaited with interest, specially if it determines for us the value of whitewash. If there are any of you who have been bitten by the craze for it, I ask you to hold your hand. To avoid prejudice against it, it is euphemistically dubbed "limewash" by its advocates. It appears to me in this connexion that the special glory of an ancient building lies in the colour and in the texture of surface, which time alone confers. Place a fresh surface—a new film over it all—and you may acquire a different beauty—a new beauty—but it is only at the expense of the loss of the old. The texture and with it the sentiment have gone.

The argument is frequently used that as all or most old buildings were limewashed to make a surface for colour painting, to rewash them is legitimate. But surely this becomes restoration in the very sense in which it should be most obnoxious to the anti-restorer. The argument assumes also that a building is in its most-to-be-desired form when in the tentative state of preparation for painting, that the glory which even the greatest builders of old could not give, and which time alone can give to architecture, is as naught to be regarded. The cult of whitewash on old buildings is clearly not to be encouraged, gentlemen, and there is the truth of it. I cling to the fifth principle I have enunciated.

And what of the wholesale restoration? That, to my mind, is equally to be reprehended, and I adhere definitely to my precept No. 1. The stone, decayed though it be, which the builder laid there—be it blackened by soot or glorified by Nature's paint-brush—has an intrinsic value and interest which can be given to no new stone which replaces it. I will never be a party to restoration for restoration's sake in the abstract. And yet where structural necessity demands it, the refusal to make the best record which can be made of the ancient work, and the demand that something different which will tell its own story shall be put in its place, seems to me foolish and pedantic to a degree. Learn the true spirit of the old work by all the attention and assiduity you can command; respect it; work in it, if so be unfortunately you must; make a record of your copy; date every stone, or insert a recording inscription; but, believe me, you are fortunate—exceptional—if your new work will ever be mistaken for the old, or need recording otherwise than by its own existence.

The restorations which are the really sad ones, as they are also the most numerous, are those in which the keynote seems to have been the desire for newness; an unfeeling travesty of the ancient work has been substituted for it by some mechanician blind to the glory with which time has dressed it, ignorant of the spirit he has to deal with. It follows that he who is to be best trusted to deal with an ancient building is he who is most in sympathy with its spirit. The utter folly of the advocacy of the engineer as restorer, just because he has neither sympathy nor knowledge, stands apparent.

I should always myself advocate the employment of two architects in collaboration on any work of reparation, so that rashness or error or ignorance might be curbed in their effects. One of these should be a man who has proved his fitness, for no monument should be put in the hands of him who has to learn his methods upon it. But in any case I should like to see constituted an authoritative committee to whom the younger man—and his senior, too, for the matter of that—might come for the resolution, free of cost, of his doubts and difficulties. I believe there are many whose sympathies and abilities lie in this direction who would willingly give their time to such a duty. The organisation of the Society for the Protection of Ancient Buildings already exists, and, with my sympathy for its aims and objects, I would like to have suggested that body to fulfil the rôle. But can we urge confidence in a society which has not restrained itself in the past from fads and fictions, and whose policy and procedure have gained a notorious reputation?

I must hark back to attempt an answer to the query as to whether we owe it as a duty to posterity to preserve a record of the ancient detail of a decaying building otherwise than on paper; in other words, shall we let all features decay until all trace of detail is lost? The time may come when the stone decay is such that structural renewal is a necessity. Is posterity then to be unable to recover the form if not the actuality of what once existed? Dilapidation may be so advanced and rapid that either destruction or renewal stare us in the face. It may be our regrettable duty to preserve the record in stone of the form at least of some small portion of each variety of work, where necessity demands, even at the expense of the immediate appearance of the rest.

But you may of necessity sometimes be called upon to add something new to an ancient edifice to take the place of what was once a part and parcel of its structure. Every remnant of a blocked-up window or doorway may be lost when it is wanted again on practical grounds, or a new buttress, perhaps, may be needed to stay a tottering wall. Then, I say, be reserved, be scholarly, be harmonious in what you design; be individual, but do not let your individuality be insane. I ask you again to observe the fifth principle.

Now the principles I have suggested for stonework apply generally to woodwork. Destruction and decay in woodwork is chiefly due to the original use of sappy timber. It takes between thirty and forty years for sappy oak to disintegrate, and it is well to note that the decay of sap-wood is not like dry-rot; it does not injure or extend to the sound wood in immediate contact with itself. Old timbers partially decayed by sap are not to be abandoned therefore for new (often pitch pine), but to be scarfed by sound oak, and I do not hesitate to say that there are few ancient roofs, I care not how dilapidated, which could not have been repaired thus *in situ*, that is without even removing the timbers to the ground, if sufficient skill and knowledge had only been at hand for the process.

I show you herewith a view of the beautiful roof of Gedney, Lincolnshire. That roof was in the last stages of decay and dilapidation. The walls were pushed out and cracked in all directions. It was repaired without moving a single timber from its place.

I can conceive no greater stigma attaching to an architect than that he finds it necessary to replace an old roof with a new one because the old one is seriously decayed.

Another point often comes before us: the dealing with an interior where modern three-coat plaster work ¾ in. to 1 in. thick and more, has smothered the contours of the walls and overridden or absorbed the coin stones of the windows and other valuable features. I have even known a case where the not unusual thirteenth-century internal batter of the walls has been straightened out by plaster reaching a thickness of 5 in. at the top and absorbing a stone cornice. This must come away, of course. Obviously, the consistent anti-restoration course would be to put in its place something which never existed before—to point up the rubble, for instance. But no, not so the Society in this case, and I heartily agree with it. You must replaster in a thin coat showing the irregularities of the walling. Your coat must not be smoothed down with a straight-edge. My custom is to put it on with a float and to brush it over with a big, stiff, flat brush about ten minutes after it is done. A satisfactory texture

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is thus secured, and in architecture it cannot be too often repeated, texture is all-important.

In your windows recollect the vast importance of iron stanchions and saddle-bars, and on no pretext allow the ancient ones which you find to be done away with. The glass painter, with too few exceptions, is the chief sinner in this matter. He has done our old churches inestimable damage, both by most of his wares and his application of them.

But the old ironwork has frequently itself done damage, and care must be used. If it has rusted in the stone, it should be temporarily removed, the rust filed away, and while the surface is bright it should be reset in cement. Paint it then with two good coats of red oxide before it has its two final coats of black, and it will not give trouble again, but act as a permanent stay to the mullions and tracery.

Stand out as far as you can against wire protecting guards to stained glass windows. Try to convince your clients of the advantage of a few fortuitous leads by way of repair, after the inroads of an all too infrequently opportune schoolboy's stone. If we could only get five-sixths of the modern stained glass windows throughout the world bestoned, what a gain it would be to our churches, and to our peace. I find that old wire guards, with their suggestion of carpenter's Gothic, there at least not misplaced, make excellent chicken runs for the parsonage garden. Equally objectionable is the plating of windows with sheets of glass —a system which mars so conspicuously York Minster, and suggests so forcibly diaconal blindness.

A word further of warning, and I have done on this head. If you find cracks in your tower, look to your bell-frame. A loose bell-frame is a too-frequent source of mischief to the tower, but I do not thereby readily accept the bell-hanger's quite certain statement that an old bell-frame cannot be repaired, but must give way *in toto* to new. There are some remarkable ancient bell-frames in the country which it would be veritable vandalism to destroy, as, for instance, the one at Pittington, near Durham.

Now let us close the consideration of churches by briefly applying these principles to a hypothetical case. You are called upon to "restore" (that is the invariable word used) an ancient church. You will, in the first place, be wise to ascertain the general views of your employers—the incumbent, the wardens, and probably a restoration committee. You will have to adapt yourself to many divergent circumstances.

You may meet genuine ecclesiologists and antiquaries, whose knowledge of the fabric and its history is ample and unique. To work with such is a genuine source of delight.

Or you may have to do with enthusiasts in different degrees; those who would make the building conform to the most advanced modern ideas of church planning, careless how such requirements fit in with its past. Or there is the parson, full of enthusiasm and high purpose, who tells us his aims are "Gothic" (which, I warn you, may mean a hankering after somebody's ecclesiastical catalogue). In such case I counsel tactful agreement, with a silent girding on of your armour of stedfastness.

Or again, you will too frequently meet those who have a merely perfunctory regard for the beauties and history of the building, and whose only idea is to make it serve at the least possible cost; and finally those—comparable almost with the first I have mentioned—who will loyally do their utmost to second your efforts and adopt your advice. Of these, let me add, there are many, but never enough.

In all cases your principles will be constant, but as your tactfulness in pressing them, so will your success be in attainment.

I am reminded of a charming and worthy vicar whose first request to me was to spare him from "twaddle" about the history of his church. He cared not for history, all he wanted was to make it stable and useful, at the least cost. I believe I satisfied his demands in every particular. I took care to observe the historical demands made upon me also, for they happened to be the key of the situation, and I am told that he now poses as the local archæologist and expounds the history of his church to interested visitors.

Now, I assume, of course, your accurate general knowledge of dates. You will search out cautiously and stedfastly the growth of the building from its earliest days, not only the main dates, which are probably easy enough, but its gradual growth and change. Observe, first of all, the plinths; look carefully at their junctions in internal angles and their respective levels. You may find nave and chancel relatively of the same date, but the plinth junction may tell you which was erected first. Remember always that the doing away with, or the renewal of, a single stone in such a position may wipe out for ever the evidences of the building's development. Then look carefully for any straight joints in walls, which point with certainty to a change of plan, and note very exactly any differences of masonry. Then see if the windows are original or subsequent insertions. Our forefathers were skilful, indeed, at these insertions, whether of windows or whole arcades, and your most careful scrutiny will sometimes be wanted. Discover also old levels of floors and of ground. In excavating for the latter look for any pieces of old leaded glass. I once discovered the missing link of a curious and interesting traceried window by the form of glass of an aperture buried in the earth opposite the window, which had been partially destroyed and built up. These are a few cursory ideas upon what may seem small, but are fertile sources of great help in the development of a preservation scheme.

By a careful examination of roof timbers I have seen the recovery, without the slightest doubt, of the whole form of an intricate roof of varying dates, and nearly all its parts, which had been mixed up indiscriminately in an eighteenth-century reconstruction, of quite a different form.

Be careful of pitfalls. Remember that you may not have been the first called upon to work your will upon the building. There were restorers even in the early centuries, and many a history has been wiped out by endeavouring to make subsequent restorations into original works.

I know of two curious columns in a fine church which, differing from the rest of an obvious Norman arcade, are fondly regarded and honoured locally as the last remnant of the Anglo-Saxon fabric. They are clever insertions of the fifteenth century. Difficult elucidation will often be overcome by a recognition of subsequent change.

Then you have the difficulty to face—what builder are you to employ? Almost to a certainty your committee will want competition among local firms. Now it is one of the misfortunes of modern methods that the architect cannot spend his whole time upon each of his works. We have to accept that inevitable difficulty. And he has perforce to do his work through the fingers of the artisan. In the country the local builder builds cottages, repairs the squire's mansion, and executes the periodical dilapidations at the parsonage, and generally does the odd jobbing of the district, with some drainage thrown in. I respect him and like to employ him in his own line. Where can he and his men gain the intricate knowledge to tackle the historical preservation of an ancient edifice, where tenderness and knowledge in every touch are essential? There are fortunately, though few and far between, builders who have made such work a hobby and brought up intelligent foremen and workmen to be experts in it. To such I acknowledge my indebtedness. Your business is to find such, to meet him on the spot, and arrange with him a fair price for the work. The damage which has been done—absolutely irreparable—to our churches, by turning on the local builder and undertaker, even if he be the churchwarden, is immense. With the soundest views and best endeavours and instructions, the architect cannot cope with the ordinary workman's intrinsic ignorance.

Here is one of the many pitfalls. I pray you take warning and avoid. Competition in such work is pure madness.

But having completed your difficult under-undertaking and preserved your fabric in a thoroughly reverent spirit, you are called upon to advise as to its furnishings. Let me beg of you another form of preservation. Preserve it from the garish tile floor, the meretricious brass lectern and all the blatant brasswork, the cathedral glass in varied tints, the pitch pine stalls and seats, and all those other elements of the taste which have distinguished the Victorian era, and are the shame of the age of church restoration. Preserve it also, or do all you can to persuade those in authority to preserve it, from the wiles and wares of the church furnisher and the indifferent glass painter—specially such as he from Munich—and the organ cases of the organ builder. Do you not recognise the difficulty of your task?

The general tenour of what I have said will apply to the second class of buildings.

I have already referred to the restoration to use of the ruined Abbey of Dunblane. This was a very exceptional case, and I cannot say that the result altogether makes one anxious of repeating the process in other possible cases. At the same time I hardly think it can be said that such work is to be deprecated altogether, if it be done with reserve and if it tends to the permanent preservation of the building. The danger comes if there be an inordinate and too likely desire to make all too spick and span, and to replace weather-worn stones, which may still be stable enough, with new, in the desire for neatness. The lovely colour the arcades have gained at Dunblane by exposure, give them a beauty they could never have otherwise acquired, and the architect has shown great judgment in leaving them severely alone.

In the adaptation of old buildings, other than churches, there is generally still greater temptation to interfere with their antiquity in favour of modern comforts. I know an antiquary whose delight is to preserve ancient and dilapidated cottages from final ruin, and to make them once more serviceable for human needs; and it is surprising how well this can be done, and how simply and inexpensively, where the taste is at hand. Such work can, I fear, only be done for love, but I trust none of you will shirk it for love if it comes in your way.

This brings me to the third and last class of buildings. Ruins to be preserved as ruins.

I have reserved till now the sixth principle —the destruction of ivy.

Of course I shall be told that I am advocating the destruction of the picturesque, but it is not so. Quite apart from the destructive qualities of ivy—the entire concealment of architecture by any evergreen growth is merely the rendering of it valueless. It might as well be a rough brick wall, and any beauty such a combination possesses belongs to the ivy and not to the architecture.

One is reminded of the seer of Brantwood's words—"The artist who looks to the stem of the ivy instead of the shaft of the pillar is carrying out in more daring freedom the debased sculptor's choice of the hair instead of the countenance." For the artist you may substitute the general lover of the picturesque and of antiquity, who is horrified when the parasitical growth has to give way to the exposure and preservation of its victim.

Of course, in the early days after ivy destruction your building looks bare and unclad, but take heart and counsel. Nature has provided a most happy substitute, which is as harmless as it is beautiful. You may plant *ampelopsis veitchii* to any extent, the lovely light-hearted and fickle but always tender sister of the stern and solemn ivy. After two or three years of patient tending and watching the growth of a plant which has tested and likes its situation is almost phenomenal. You have the lovely daintiness of the spring leaves, the richness of the summer green, and the glory of the autumn sunsets. And when the glory has departed, all your architecture is revealed again, with the slender tendrils only adding texture to the walls.

At the highly interesting church of Westwell, near Ashford in Kent, a church where the thirteenth century groining is done in concrete, this lovely creeper has been permitted to grow over the window glass, which it loves to do. The glass is fortunately transparent. The effect is more beautiful than any modern glass painter has ever conceived, and the contrast between Nature's handiwork in glass-painting and that of man in the east window, which alone is dight with unhappy saints, is striking indeed.

I commend it to you.

First, then, in the protection of a ruin, get rid of your ivy. The thick stems should be cut at about 3 ft. distances and dressed with corrosive sublimate or any strong destructive chemical. The ivy must not be torn down from the face of the wall until it has lost its power of clinging, and should then be most carefully removed by the aid of scaffolding, and what is still more important, the aid of tender-handed and careful workmen.

You will find frequently great ivy stems growing in the very centre of the walls, disturbing the core and pressing out the ashlar. There is no other course but to take out a stone

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or more and destroy it by removing all that can be reached and killing the remainder. Again, you will have, perhaps, great dead ivy stems to deal with (for even ivy fulfils in time the course of nature) which have wrapped themselves round the ruin, and can hardly be displaced without disturbance of its stones. I cannot prescribe generally for such cases. They are sometimes most difficult to meet, and I can only recommend the ample use of scaffolding and shoring. I have known cases where the removal of the ivy meant necessarily the destruction of a small feature, such as a pillar. In that case alone the parasite must be allowed to stay and continue to sustain its victim until its life is lived. Posterity must then deal with it as best it may.

Obviously the most important duty is to protect roofless walls from the inroads of rain and frost. The method adopted at Kirkstall was to carry the irregular walls up to more or less the same level and cope with flat stones, slightly weathered. This, no doubt, is practically effectual if the coping stone is good. But the sacrifice is very great. The building loses its picturesque claim as a ruin, and becomes formal at once. I cannot see that so drastic a treatment is necessary. It is quite possible to remove the soil and vegetation from the rough wall tops, and grout them in with cement, leaving their irregular contour, and it is only necessary to provide for carrying off the rain with fairly even distribution. A careful workman can do this under careful direction.

There are those who are fearful of the use of cement in connexion with old walls. Its danger consists in its improper use. It must be of the best quality and must be well aired before use, and not used too strong.

The grouting in of cracks with cement, and if necessary the pointing with cement, can also be accomplished with no damage to the hoary antiquity of a ruin.

In pointing, the generally earthy matter must be well raked out, and the cement kept well back from the face. This can be done by means of a stick. Our forefathers were generally alive to the advantages of a sufficiently wide joint to allow of this.

We come now to the difficult point of the treatment of reconstructions of an ancient building, necessary for its proper sustenance.

Occasions arise where it is absolutely necessary to reconstruct part of an arcade, an arch, or a buttress, or perhaps a vault, or some tracery. It appears to be an accepted principle, even by our keenest historic friends, that where old stones exist and their approximate position is known, they may be put back—reused. But the doctrine has been put forward and acted upon, that, although you may build part of a feature with its old stones, you may not add to their number by new stones to the same section. A system has been adopted of cutting such added mouldings to an appreciably different section; for instance, at Kirkstall rounds or beads or bowtels are cut into facets. The principles adopted are not easily read. Apparently old square forms may be replaced by new square forms. Large rounds must be replaced by facets or chamfers, but small beads may be sometimes the same as the old, and sometimes cut into facets.

Now I do not hold with this system. I protest strongly against it, for I believe it to be false in logic, as it is injurious in effect.

The architecture of the building is ruined by the frittering away of its artistic forms in facets. To the uninstructed beholder, when the time has come for the new stone to weather as the old, the difference will mean nothing, but the artist's eye will be always offended. If you are afraid of falsifying history, there are two courses. Either rebuild in rough hewn masonry, which will tell its tale, or copy the old as nearly as you can, but put a mark or date on each stone if you will leave some imperishable record of your work. It is easy enough. And believe me, when the time comes—as it will come—that enlightened views on these subjects have prevailed and are general, if you act thus, generations to come will not laugh in their sleeve at you.

Kirkstall Abbey furnishes an instance where the preservation of one of the most interesting ruins has been attempted in a thoroughly scientific spirit by an architect and antiquary who holds a foremost place in his own department. The first process was, of course, to clear away all ivy and other parasites, which made the ruin one of the most pictorially beautiful. Following this came the structural support of shaky parts, and the exclusion of water from the walls and groins, where such existed. I do not allude here to the excavations of heaped-up earth, which is a purely antiquarian pursuit, and ought to be undertaken as a matter of course in connexion with work of preservation.

The process of protecting the walls from the weather has been, as already said, to carry them up in rough mason's work to a more or less continuous level, and cope them with a flat coping.

Where architectural features, such as the external arches of the dorter windows, have been met with in the process, these have been rebuilt with narrow slabs of stone, so as not to be mistaken for ancient work. There is, however, one case where an old arch has been restored in its old form with new stone.

I have already spoken of the facetted shafts and arch moulds, where it has been necessary to renew them.

The carriage of the southern and part of the eastern side, all that remained, of the shaky central tower, was the crux. The north-west tower pier and the nave arcade pier adjoining had fallen, and, of course, the north and west tower arches with them.

The south-west tower pier had sunk, and the foundation was evidently insecure.

Mr. Micklethwaite completes the disjointed nave, and with it the north tower arch, using facetted forms where old stones are not to hand. To assist the south-west tower pier he builds up the easternmost arch of the south nave arcade and the adjoining aisle arch, and to support the broken end of the tower adopts the bold expedient of erecting a detached pier adjoining the south-west tower pier. This new pier is an oblong block of dressed masonry with chamfered edges, merging in a very architectural manner into the upper portion of the structure.

Now this is thoroughly courageous work, and all courage demands respect.

I could wish it had been possible to secure the foundation of the south-west tower pier (as would have been done if the building had been still in use), and thus allow the western tower arch to be thrown across as the northern one has been. Certainly the total result would have been more pleasing, and the security greater. I fancy, too, that Mr. Micklethwaite will readily subscribe to my sentiment, "Don't build such a pier if you can help it." I must add my personal opinion that if such a pier is essential, let it be in rough-hewn masonry.

My view also shows the skeleton tracery introduced into the belfry. This, I think, will be an eyesore for all time. I had rather have seen some rough masonry erected to do the work of catching up the overhanging arched fragment, or a proper reconstruction of the ancient window—duly recorded as modern, of course.

The effect of the method of wall coping is best seen by the view of the east end of the chapter-house. I confess I have my doubts whether so disfiguring a treatment can be justified by any practical or archæological necessity of avoiding counterfeits. It offends against my fifth principle sorely.

Let me turn now to Bayham Abbey, where a similar but much simpler problem had to be faced. Here the endeavour was to preserve and protect the building as far as could be without altering its form in any way. Bayham is a Premonstratensian structure of singularly interesting plan and character. The ruins—and, I may add, the ivy—had reached such a point that great havoc had befallen during the last two or three years, when the owner, Lord Camden, alarmed by the recent collapse of a great part of the last remnant of the interesting choir clerestory, came to the rescue and determined to make the remainder safe.

The ivy, of course, was first dealt with, as I have already described, but the growth was such that this was no easy affair. Some huge dead branches were ready at any time to bring portions of the structure with them. The roots had grown in the very centre of some of the walls and pressed out the ashlar on both faces. One new buttress had to be built to sustain the tottering nave. This was done with rough masonry, and rough masonry was used similarly to support a large overhanging piece of wall in the south transept. The tops of the walls were grouted in, the fissures made good, and the pointing executed as I have described. Lastly, ampelopsis has been planted, and I hope in three or four years, only those who actually know what Lord Camden has done will be aware that any hand but Nature's has been at work. Nevertheless, I believe the ruin is preserved for centuries.

In passing, let me say, never protect groining found in ruins with a wooden weather roof. Ruins are naturally neglected, and such a roof wants attention from time to time. If left alone it decays and becomes an additional weakness, instead of a protection. Use always permanent materials.

Gentlemen, the subject I have ventured to bring before you is not less difficult because barely two minds think alike upon it, and I can but hope that my views will receive their meed of criticism. But I hope, too, it will be kindly, and will give me the credit of pressing before all else upon the keen restorer the doctrine of "hands off," of recognising an actual as well as a sentimental beauty in time-worn and time-honoured antiquity, and of using my utmost endeavours to preserve what can be wiped out in an hour, and, like Humpty Dumpty, never picked up again.

But I must draw to a close. You may think that what I have said is elementary, and reminds you only of much that you have, or would have, thought out for yourselves. So far as you disagree with the methods I advocate, I hope that you will at least admit that they are logical and, above all, free from fads. The last man who should be entrusted with the care or preservation of our ancient monuments, is the man of fads. The great heritage committed to our keeping belongs to a higher plane and demands a broader view than lies within his horizon.

Mr. Caröe also read some remarks from Professors Church and Jackson as to the use of limewash for preserving stonework.

Professor Church wrote that his present conviction was that neither limewashing nor whitewashing was mechanically, chemically, or artistically an appropriate treatment for the surface of decayed stonework possessing architectural merit. Some method was required which would involve no tendency to hide, to encrust, and finally, to bring down the rotten superficial layer. The preparation to be used should reconstitute, so far as possible, the cementing material of the original stone without greatly changing its aspect. It should be penetrative, of easy application, and should prevent further decay. Limewash possessed one merit only—so long as it adhered to the surface hostile agencies were thwarted. But it possessed scarcely any penetrative power; it did not appreciably reconstitute the cement of the injured stone and it did not stop internal mischief.

Professor Herbert Jackson wrote:—"The application of limewash to decaying stonework undoubtedly tends to retard the decay to a certain extent. This is true both of sandstones and limestones which have been affected by sulphuric acid present in the atmosphere of towns. . . . There are, however, reasons why the application of limewash is restricted in usefulness. One is the difficulty of obtaining an adherent coating, with the result that unsuspected mischief goes on under the limewash, and is not perceived until it has proceeded far enough to cause large pieces of the stonework to become detached together with the loosely adhering flakes of limewash. This difficulty may to some extent be overcome by using the limewash in the form of a very thin milk of lime and applying it two or three times in this weak state. . . . Another reason why limewash fails to act in a very satisfactory manner is to be found in the properties of the compound formed by the action of sulphuric acid upon the lime. This compound (calcium sulphate) is sufficiently soluble in water to allow of its migration under the influence of drainage and of its consequent accumulation in parts of the stone which are in a position to receive such drainage. . . . In many cases this action has been proved to have been considerable, and to have been the cause of much damage. Notwithstanding the disadvantages connected with the use of limewash it is probably next to baryta water. . . ."

Mr. Aston Webb, A.R.A., in proposing a vote of thanks to Mr. Caröe, said the paper was a most exhaustive one, and no one could have dealt with the subject more authoritatively, or more courageously, than Mr. Caröe had done. Mr. Caröe began by a quotation from John Ruskin, who was the great anti-restorer of his time, as well as a great lover of architecture, especially of old work. One of the greatest distinctions which the Association had received

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was that John Ruskin chose that society before whom (in 1857) to read his paper on the "Influence of Imagination in Architecture," and he could imagine no greater treat than to have been present on that occasion and have heard that grand old man read that paper. Every member of the Association ought not only to read it, but to know it by heart, and it had often occurred to him that if ever the Association were hard up for a paper it would give much pleasure and profit to have Ruskin's paper read again. In all that was said in that paper John Ruskin was enunciating the principles dealt with by Mr. Caröe, that any one who touched an old building must do it only for love, and that any one who touched an old building must, or should, entirely efface himself. Those were two necessary conditions. Mr. Ruskin said in his paper, if you put money before your art, it is all over with you; if you put fame before your art, it is all over with you; if you put position before your art, it is all over with you; and certainly any one who attempts to do any of these things in dealing with old buildings, it was all over with them. He thought that though perhaps they had to blame themselves, and much as no doubt criticism of the Society for the Protection of Ancient Buildings was correct, yet in comparison with the wholesale devastation which had taken place in France and Germany and other countries, we had come out of the necessary ordeal of restoration more satisfactorily than those countries. No one in dealing with this subject could avoid referring to the Society for the Protection of Ancient Buildings and referring with sympathy, as Mr. Caröe very properly did. All must sympathise with the objects with which the Society was started. There was an old saying that you cannot make an omelette without breaking eggs, and so work of this kind could not be done without a certain amount of disturbance. Many of them thought that the Society broke more eggs than was necessary, especially in its early days, but they must at the same time recognise the great work which the Society set out to do, and the use which a great deal of its effort had been, though they might regret the precise form which their action often took. He had seen great many of the leaflets issued by the Society, some of which were good and expressive—though of course a little exaggerated, as leaflets generally were. With regard to whitewash and limewash, he thought it could not be seriously intended to whitewash Westminster Abbey. If that were done he believed there would be a revolution, for no one in England who cared for architecture would tolerate that. He could not understand it; he had heard of a man building a church and then whitewashing it—whether it was because he did not like the mouldings, and wished to soften them down, he did not know—but he could understand that being done, but he could not think of Westminster Abbey, or any beautiful building, being treated in that way. With Mr. Caröe's proposition, *i.e.*, to efface their own work in restoration, they must all agree. He knew a church which was restored some years ago, and when subsequently visited by an American, said as he left the building, "Well, I guess you will be restoring this old church before long. I hope you won't be spoiling it." As to modern additions to a building, it seemed to him that they must face the fact that if a church was too small owing to the increase of inhabitants of a district, and additional accommodation had to be provided, the church ought to be enlarged. He was not sure, but he thought the Society for the Protection of Ancient Buildings suggested that the right thing to do was to leave the old church unaltered, and build another not far off. That was not a practical suggestion. To begin with, an unoccupied building went to ruin more quickly than an occupied one, and in country districts, where it was often difficult to keep up one church, it would be quite impossible to keep up two. In this case he thought the building should be enlarged, but that there should be obvious evidence that the addition was an addition of the day. As to organs, he thought that organs in churches were growing out of all reason. Organists should be put under a strong curb, for they came into a church and said they must have the big swell here and the bellows there, and a small chancel was soon swallowed up by the organ. A good organ was a fine thing in a church, but too often it was introduced more for the display of the organist than for the good of the architecture, which it often entirely destroyed. Mr. Caröe made an interesting point about the levels of churches and altars, this was often a difficult point, because the level of the altar was often insisted upon, and the lowness of the window was a difficulty. He thought the best way to get over it was to advance the altar and so raise it and the reredos independently of the east window altogether. As to Bayham Abbey, some years ago one of the arches of the gateway fell down, and he was asked to advise as to what should be done. He made a report, and in listening that evening to what had been done at Bayham (which he had not seen since its repair), he found that almost precisely what he thought at the time ought to be done had been carried out. He was delighted that the building, which was one of the most interesting in England, and the situation and surroundings of which were most beautiful, had been repaired in such an able way, and that what was proper and reasonable and best had been done to put the building in such a state as to make it last for centuries.

Mr. Thackeray Turner said he had listened to the paper with great pleasure, for he agreed with most that had been said by the lecturer. As to the little gibe about his or somebody's spelling on certain tablets, the reference was a little cryptic. As to the methods and statements of his Society, Mr. Caröe made a special point as to the necessity of architects, in dealing with ancient buildings, suppressing themselves. That was a difficult thing to do, but it was much more difficult for the secretary of a society with objects like those of the Society for the Protection of Ancient Buildings to write a letter which is pleasing, and to put hostile views so as not to give offence; it was a most difficult, often an impossible task, for people easily took offence when they did not want views and advice. Mr, Caröe had made two specific criticisms against the Society, viz., that the Society was responsible for advocating the use of whitewash, and also that it advocated the use of blue bricks in the interior of buildings. As to the blue bricks, he thought they were justified in trying to preserve a building without interfering with the external aspect of it. If they had to touch the face of a building in repairing it there must be a loss, for they could not touch an ancient building without a loss to it; but when repair was necessary they could strengthen the building by taking out portions of the interior rubble work and putting a material in its place which would bond in with the outside face of the wall; they would only lose some of the rubble, and if the building inside had a plaster face they would, in order to deal with the rubble and retain the front, only have to remove that plaster, which could be replaced. He admitted it was an evil to have to do this, but he thought it was a necessary evil. He did not think it mattered what material was used in this work, for it did not show, but blue bricks were convenient things to use, for where cement was used it adhered to them firmly, besides which the bricks did not absorb the water in the cement, and as it was desirable for the cement to set slowly that was an important matter. The blue brick was non-absorbent, and so the water did not quickly leave the cement used, which had a chance of setting slowly. Mr. Caröe advocated the use of cement on the top of walls. He (the speaker) had a great antipathy to that, though he admitted that used properly it was a useful material, but the difficulty was to get it properly used. Mr. Caröe seemed to think that it was possible to repair cracks and fissures with grouting. His (the speaker's) experience was that grouting would go down a very little way indeed. He had seen a wall which had been grouted pulled to pieces, and it was disappointing to see what a little way the grouting had gone. The process of repairing interior walls with blue bricks had for its definite object the getting over the difficulty of grouting. The bond could be put in and they could grout down to that level. As to the use of whitewash, he thought the reports of Professors Church and Jackson were not so unfavourable as to lead them to discard the use of whitewash. He did not want to whitewash every building, and "white"-wash need not be used at all; it could be coloured. His Society considered it a lesser evil to white—or colour—wash a building than to let it go on decaying. It was the sulphur in town atmosphere which destroyed buildings, and if a coat of lime was put on, the stonework was protected, and when necessary a fresh coat of limewash could be put on. It seemed wiser to do that than to let the building go, and after all whitewash could be removed if desired. It seemed unfair to posterity to let fine buildings which were decaying alone, and we ought to do what we could to preserve them. The experiments being carried out by Professor Church for the Society were not resulting quite as hopefully as they wished, but the work at Westminster Abbey had been a great success. He thought Mr. Caröe was mistaken in saying that Mr. Micklethwaite was responsible for the work at the western towers of the Abbey. Mr. Micklethwaite was not doing that work, and was in no way responsible, and it was a matter of annoyance to him that he was credited with it—probably because he did not sympathise with the work.

Professor Beresford Pite said he had much pleasure in seconding the vote of thanks to Mr. Caröe for a most interesting and instructive paper. He was a little in doubt whether the Association was the right body before which such a paper should have been read, because it was doubtful whether members of the Association would ever be likely to have old buildings to deal with, as old buildings became fewer and fewer. The paper had brought home to him very forcibly the fact that the restoration of ancient buildings was a highly-specialised matter—a matter which, in his opinion, did not belong to the work of an architect. It no more belonged to an architect than did the cultivation of young trees belong to the work of the wood-cutter. There was a fascination about building—about bricks, and the smell of mortar and new timber—which was akin to the feeling that some statesmen and others had for cutting down trees: some wanted to plant, others cut down. When a young man he knew a country gentleman who bought a beautiful growing wood of over 100 acres, right in the middle of which he intended to build his house. The house was set out, and the owner, who was shown the amount of clearance he ought to make, began to cut down the trees himself, and by the time the house was finished he had made a skinny avenue here and there, but had destroyed the wood. That gentleman suffered from the curse of cutting down. Much the same fever took possession of a man when he had to deal with an old building, for once they began pulling it about there seemed to be no end to what was done. Architects were very liable to suffer from a craving to do new work—properly so, in a way. Mr. Caröe said they were not to be insane. Well, he (the speaker) ventured to say there was insanity in that, for how could a man know that he was not insane? A man had only his brain to tell him, and, if insane, how was he to know? It was much the same with another of Mr. Caröe's principles, *i.e.*, "efface yourself!" The only way to efface oneself was, in the case of a restoration, to let the whole thing alone, and, if the work were in the country, to take the next train back to London. Therefore, between inviting a man not to be insane and telling him to efface himself, they were putting him in an altogether hopeless position in regard to restoration, and the best thing would be for the architect to let it alone. Would it not be better to hand over all the old buildings in the country that needed repair to the Society for the Protection of Ancient Buildings? He made the suggestion quite seriously, for he had no doubt that this matter of the repair of ancient buildings must be separated as a doctrine and as an art from the art of building and designing. The two streams of thought and action came into conflict, and it was very difficult to combine them. There was the highly conservative element—the lover of history and antiquity, and the lover of that "surface" to which Mr. Turner had referred, though it seemed to him that our love of ancient buildings ought to be due to a little more than the love of their skin. The masonry wall from back to front was as much a matter of historical or antiquarian interest as the surface of the wall, and that ought not to be overlooked. It seemed to him that the antiquarian and historical element were very strong, and were contrary to the other element—the element with which the architect had to deal—the practical element, and it was absurd to oppose practical requirements and put them in the background. The architect was not called in for that purpose, but to give effect to those requirements, and if he ceased to do so

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he would then, indeed, efface himself, and he might consult with his friends whether he was insane or not. The position of an architect called in to see to an ancient building was a very anomalous one owing to this contrast and the difficulty which existed between the antiquarian and the progressive elements, and it seemed to be a chronic difficulty. The repair and preservation of an old building was one thing, and the alteration of it and the addition of new work to it was another, and when both had to be done in the same operation and by one and the same man for the same employer the difficulty was very great. He was full of admiration of Mr. Caröe's unstinted zeal in the matter of the roof of Gedney Church and in the repair of its walls; that was an evidence of a keen and careful study, and an intellectual grasp of the subject. But take the case of a man who had been called in to build a chapel or addition to a building, or something which was to be an integral part of it—to say that he was not to design it as something distinct and in defiance of everything historical, was asking him not to be essentially practical and modern. The treatment of ancient buildings was becoming increasingly a matter for experts, and the antiquarian and historical elements were so important that they were almost impossible to a man who should be eminently practical and courageously self-assertive. As to the work at Westminster Abbey, he had already understood that Mr. Micklethwaite was not responsible for it: the work was in continuation of something done before he was consulted, and he (the speaker) regretted it. He would rather see the decayed work there, which did not affect the structure, than such pedantic restoration work—nineteenth-century tracery, for instance, done fifteenth-century way, for that was what it amounted to. In regard to old buildings, it was vital to the architectural student not only to study the form but the technique of the work to get to love the building for the way in which it was built—for the way in which the materials were handled. One never need be afraid of modern work being mistaken for old, for modern masons did not work their stones as the thirteenth-century masons, for instance, did, and if one began to dissect a wall and looked at a section, there was no mistaking its character or the habit of the men who built it, for that was written in the work for those who had eyes to see. With eyes to see how work developed, one got a wonderful key to the date of mediæval work, and this work could not be imitated, for modern masons would not repeat the work that the old masons did. They would now probably use machinery for working the masonry at Kirkstall, for instance. As to limewash, and whether there was any merit in it, he knew a mason or two who insisted that in London limewater applied to the softer class of building stones rendered them much more serviceable. As to the dressing of stone, there seemed nothing more absurd, and there was nothing more irritating, to his mind, than to see Norman restorations—he had Southwell Minster in his mind—where all the old feeling was lost sight of and forgotten, or undiscerned, and where modern masons, under the direction of architects, had cut zigzags and chevrons and ornaments of that sort all round the arches just as if they were Norman workmen doing the best they could, and employing the highest forms of art known to them with the greatest possible skill. That was a stupid practice, which no words were possible to denounce. As to the use of *Ampelopsis Veitchii*, it was delightful to find it suddenly introduced as the friend of our ruins.

The Chairman, in putting the vote of thanks, said the paper must be of great interest to all of them, for they all took an interest more or less in our old buildings and their restoration. The more they came into contact with old work the more regret most of them would feel at having to do anything to them, and the more carefully they would carry out the work when the work was necessary.

The vote of thanks having been heartily agreed to, and a vote of thanks having, on the motion of the Chairman, been passed to Mr. F. R. Taylor for making the lantern slides which had been shown, and to Mr. E. W. M. Wonnacott for operating the lantern,

Mr. Caröe, in reply, said he should like to add his thanks to those two gentlemen, and also to Mr. Cubitt who obtained the photographs and made the slides in connexion with Gedney Church. As to Mr. Turner, he had no intention of accusing him of misspelling but he might mention that he had in his mind a tablet which he knew had been erected under the ægis of the Society for the Protection of Ancient Buildings. It related how a certain tower was built in such and such a year, and how that in consequence of a defective bell frame and the ringing of the bells it began to tumble down, and how, under the direction of the Society, it was rebuilt in blue brick within 10 ft. of the "botom." As to Mr. Turner's reference to the use of blue bricks in the interiors of walls, he (the speaker) had especially referred to their use in the repair of cracks and fissures on the outside walls. Grout, if properly used, would run down about 5 ft., but it was not safe to trust to it going down more than 3 ft. He once had the satisfaction of running in 20 tons of cement into the walls of a tower, and after that he felt it could not be said that grout could not be got to penetrate. The effect of ringing on a church tower was often very curious, and there were what were called ringing cracks. The effect of ringing in the case of an ashlar building, with a loose core inside the walls, was to make the inside walls settle down and the outside walls to stay, and, all the weight thus coming on the outside walls, they began to crack. As to the work at the tower of Westminster Abbey, Mr. Micklethwaite told him he was restoring it and that, as he was using Portland stone, he objected to Mr. Pearson's work next door because it was in Chilmark stone. He did not agree with Professor Pite as to that work, and he thought that Mr. Micklethwaite was doing the only possible thing in the circumstances. It might be unfortunate, but it was necessary and the treatment was right. If Mr. Micklethwaite, however, had restored the stonework in blue brick, he would have been doing a thing we could not tolerate. He (the speaker) did not think he had said they were not to be practical. He was sorry he had not stated that they ought to be practical. It seemed to him that the sustenation of an old building and the retention, for instance, of its roof timbers without taking them down, and the dealing with structural necessities without destroying the appearance of the building, were things which no one but an architect could tackle—the mere antiquary could not, and the restorations of the antiquary were generally most futile affairs. What was necessary was a man who possessed the structural knowledge and ability which Ruskin referred to as being inseparable from the artistic side of design. The greatest designers were constructors, and a constructor was necessary in these works. He had said: "be individual," and he meant be individual when called upon to design new work attached to old. By all means be individual, but be that in such a way as would be in harmony with the other work and not out of harmony.

The Chairman announced that the next meeting would be held on the 25th inst., when Mr. E. A. Gruning will read a paper on "Arbitrations."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

V.—ELECTRA HOUSE, FINSBURY PAVEMENT.

ON Saturday, April 12, the fifth visit of the Session was made to the new offices of the Eastern Telegraph Company, Electra House, Finsbury-pavement. Mr. John Belcher, A.R.A., the architect, kindly met the members, a large number of whom were present, and thoroughly explained the many and varied points of interest.

The building stands at the corner of West-street and Finsbury-pavement, and Mr. Belcher has again shown that business premises can be designed to fulfil all the conditions required by the exigencies of modern commercial life, combining at the same time architectural greatness with the impress of their own particular individuality.

The never-failing mystery of the electric telegraph, its wonderful uses and possibilities, and its intimate relations with our lives, have been finely indicated by the work of Mr. George Frampton, Mr. Goscombe John, A.R.A., Mr. Alfred Drury, and Mr. F. W. Pomeroy, all of whom have worked on the central portion of the Finsbury Pavement façade. The great semicircular window also, over the entrance doorway, is filled with most beautiful glass by Messrs. Powell. The design by Mr. Belcher shows the Goddess Electra seated on the globe, and lines representing cables stream from the head of the figure to the extremities of the window, which is divided into three panels by mullions. At the bottom of the centre panel is the full-bellied ship of ancient days and a light-house, thus forming an effective contrast between the old and new methods of communication.

The entrance-hall, all in Portland stone, contains some charming detail, and will have a sculptured frieze by Mr. Pomeroy (the beginning and end panels of which are already carried out) illustrating in a poetical way the life and effects of the deep-sea cables. Through this hall, and immediately facing the entrance, are the main stairs and lift. Right and left of these are corridors which give access to the front shops and offices facing Finsbury-pavement. These corridors are lighted by long areas, which, again, give light to the clerks' large offices behind.

It is worth noting that an entirely separate area has been arranged to light the sanitary conveniences, and thus these will not ventilate themselves into working rooms, as is so often the case. The areas are in glazed bricks, and are easily cleaned by means of a permanent travelling cradle.

The ground floor in front is devoted to shops, and at the West street corner is a bank; the first floor offices will be let off, but the Eastern Telegraph and other allied companies occupy the remainder of the buildings. The Board-room and chief officials' private rooms are on the second floor, in front, the joinery being all in mahogany.

The first, second, and third floor corridors, with their stone piers and pilasters and small flat domes and vaults, were particularly noticed, and a delightful little finial, a bronze globe, intersected with cable lines, supported by winged figures, at the foot of the side staircase, was much admired.

The entire building is perfectly lighted, and the healthy working conditions for the occupants have been thoroughly considered—a marked contrast to many modern city buildings. The elevations are all in Portland stone, with the exception of the ground floor story, which is of Cornish grey granite; the plinth is slightly polished, but, needless to say, the remainder is left fine-axed and tones well with the stone above.

Disengaged columns, the caps of which are all varied, give the required effect of light and shade, and the treatment of the windows, whereby a deep reveal is obtained internally, is well worth study.

Space does not permit of a more detailed description, and it only remains to say that the visit proved of more than usual interest.

THE INCORPORATED INSTITUTE OF BRITISH DECORATORS:

ANNUAL DINNER.

THE annual dinner of the Incorporated Institute of British Decorators was held on Monday evening at the Trocadero Restaurant, Shaftesbury-avenue, Mr. J. D. Crace, the President, in the chair. Among those present were Col. Bennett, Capt. Andrews, Capt. Heath, Messrs. E. T. Hall, F.R.I.B.A., J. F. Crace, Scott Morton, J. Sibthorpe, W. G. Sutherland, G. C. Haite, F. Cowtan, F. G. Dear, F. C. Simpson, W. A. Smith, F. W. Englefield, J. Scott, A. Sanderson, W. O. Greenaway, J. Carpenter, J. Morley Williams, J. G. Cole, J. Higson, J. Anderson, C. Cowtan, and A. S. Jennings.

After the usual loyal toasts, Mr. W. Scott Morton proposed "The Imperial Forces," which was responded to by Col. Bennett.

Mr. W. Sutherland, in submitting "The Incorporated Institute of British Decorators," said the formation of the Institute was due to the late Mr. Thomas Bonner. The idea had been formulating in his mind for some years, awaiting the opportunity to be brought forth. It was developed in Manchester some eight years ago, and ultimately brought into construction four years later. His idea was to gather in one institute all those decorators in the United Kingdom who had an ideal in their trade, to whom their calling was not a mere matter of pounds, shillings, and pence, but who had some higher object at which to aim. The success of their work as an institute, he considered, was due to two things: first, the connexion they had been enabled to establish with the Painters' and Stainers' Com-

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pany, who had given them permission to make their headquarters at their hall; and next—and this was by no means second in importance—that they had been able to call to their aid and enlist in their work the ability of Mr. J. D. Crace, who was their first President. They hoped he would continue to hold that position for many years.

The President, in reply, said the Institute had been the means of raising the standard of the calling and those who practised it. He considered that in no calling or profession was it possible to make some accepted standard of conduct and of professional practice until some centre of meeting and some means of recognising a brotherhood, such as an association or institute, had been established. In an institute there was a public opinion—a limited public opinion, inasmuch as the members themselves exercised a certain moral pressure on each other. In looking round at other callings, they recognised a higher standard, not only of knowledge, but of conduct and honour toward one another as the result of the formation of such societies. The whole tone of the architect's profession, for instance, had been elevated since the establishment of the Royal Institute of British Architects. Fifty years ago there was a small number of architects who stood high in their calling, and of whom no one could say anything but good, but there was a very large following of men whose reputations were open to much criticism. It would not be possible to find this large following now, and, in fact, there was no question that where men of any calling were brought together, they not only learned to respect one another, but to establish amongst themselves a standard of conduct. The interchange of knowledge and details of practice which resulted from the meetings were also very beneficial. The men who had been most successful were, as a rule, only too pleased to give others the benefit of their experience. The interchange of ideas which followed the transmitting of experience was of inestimable value. A subject which was engaging their attention at the present time was the question of arbitration. He considered that arbitration, if once clearly established, would lead to a great saving of trouble. Many misunderstandings arose, and litigation followed for want of a proper understanding between the employer and decorator. He had had very few disputes, but still these might have been saved if there had been some decision which could have been recognised as being impartial. The question of contracts was also very important. They were very anxious to devise a form of contract which should prove of advantage both to architects and decorators. In this they hoped to obtain the co-operation of the Royal Institute of British Architects.

Mr. C. Cowtan then proposed "The National Association of Master Painters of England and Wales, Scotland and Ireland." He said that the Association had done more for their business than any other institution which had existed in connection with their trade. They had to deal with the British workmen, who formed a far more difficult element than the architects with whom the Institute of British Decorators had to deal, and he was glad to say that they had achieved a considerable amount of success. It was gratifying to know that they had awakened the apprenticeship system to some extent. They had been unable to do so in London, but they had been successful in the provinces, and from there they obtained the best workmen.

Mr. J. G. Cole, in responding on behalf of the Association for England and Wales, said they were doing a great work even though, perhaps, they were travelling in the lower grades of their craft. During the eight years of their existence they had been able to get on with their workmen in a very satisfactory manner. They now had a membership of 1,600 master painters, and among other things they had assisted technical schools already in existence and helped in the formation of others. They had also done their best with the manufacturers so that they could get the best materials, and they now had an analyst in connexion with the Association to whom unsatisfactory materials could be sent.

Mr. John Scott, in replying for the Scotch Association, stated that owing to the details being decided by the local branches, they had more time and energy to go forward in the higher aims of the craft. There were many things which local associations could consider, and one was the question as to the advisability of apprentices attending day technical schools as well as night schools.

Mr. Sibthorpe, replying for the Association in Ireland, said that in his country they never regretted the presence of the genuine decorator who hailed from England. He well remembered the great stimulus which was given to genuine decoration in Ireland by a number of worthy instances of what decoration should be that were rendered by Mr. Crace's father. They, however, regretted the presence of the upholsterer who did not give value for money received in the way of decoration. This was one of the things which this Institute of British Decorators would set right. They would rescue decorative art from the carpenter and curtain-man.

The President proposed "The Visitors."

Mr. E. T. Hall responded. He said that with regard to the question of contracts there was a keynote which they should bear in mind, namely, that in laying down conditions ambiguity should be avoided. When the conditions were not clear misunderstandings arose. He then referred to the wonderful buildings which existed in Ceylon 300 years before Christ. There was evidence of a structure 360 ft. in diameter, and 405 ft. high. In the king's room in one of the palaces there were 1,600 columns, probably gold plated, with friezes of precious stones—a style of decoration which very few clients would be able to pay for at the present day.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—At the meeting of this Institution, held at the Westminster Palace Hotel on April 11, the chairman, Mr. Percival Marshall, presiding, the paper read was entitled "Notes on Modern Lighthouse Construction," by Mr. G. Drysdale Sweetman, of Ryde. To illustrate the evolution of structural design, the four erections on the Eddystone were briefly examined, and their chief points of difference indicated as follows:—The base of Winstanley's tower (1695) was built of stone strengthened with iron bands. Its sides were vertical, and were encumbered with a profusion of unnecessary and even dangerously obstructive ornament. It was in the form of an octagon and 100 ft. high. Destroyed by a storm in 1703, Rudyerd's tower (1705) was built of wood ballasted with stone. Its plan was circular, and the unwieldy ornament was omitted. In section it was a frustum of a cone, 23 ft. in diameter at the base, and 14 ft. at the top, and about 67 ft. high. The foundation rock was levelled off in steps, and the tower united to it by means of bolts keyed into the rock. It was destroyed by fire in 1755. Smeaton's historic structure was finished in 1759. The material was stone, and for external form the trunk of an oak tree was chosen. The base was thus considerably broadened and the waist narrowed in comparison with Rudyerd's tower. The masonry was bonded together and into the rock by an elaborate system of dovetailing. It was 76 ft. 6 in. high, and was partially removed in 1882 owing to the concussive erosion of the bed-rock, which threatened its stability. Douglass' new Eddystone was built of granite, and differed from the last named in having a cylindrical base with vertical sides carried 2 ft. 6 in. above high water mark. The tower, which was a concave elliptic frustum, started from the top of this vertical plinth. The total height from foundation to vane was 170 ft. The walls were 8 ft. 6 in. thick at the base, and 2 ft. 3 in. at the top. The tower was solid to a height of 25 ft. 6 in. above high water. In some experiments on wave power, made at the Skerryvore and at the Bell Rock by Thomas Stevenson, so great forces as 6,083 lbs. per foot at the former and 3,013 lbs. at the latter station had been recorded. With these stupendous forces to combat it behoved the designer to appreciate every minute detail of the disturbing elements, and to endeavour to neutralise their action. By spreading out the base, not only was a broader foundation area obtained and the centre of gravity lowered, but also the force centre of each wave stroke was raised by the momentum of its impact, and a portion of its violence dissipated in overcoming the force of gravity. There was a limit, however, to this base-spreading policy, set by the tendency of the wave crests and spray to rise so as to obscure the lantern, and it was partly to obviate this difficulty that the late Sir James Douglass designed the new Eddystone with a cylindrical base. The generally accepted shape for a lighthouse in plan was circular, but the suggestion was offered that with a polygonal plan of many sides, but little more obstruction would be made to the waves, and instead of swirling round as in the case of a circular tower, the waves would be made to take a rather divergent course, and so offer a leeside for landing purposes. The foundation courses should, in all cases, be sunk below the surface of the rock, for though the stability of the structure depended, for the most part, on its weight and the low position of its centre of gravity, the idea was to make the tower virtually a projection of the rock itself. It was important that the pressure of all the materials and structural units within the tower should act vertically, so as not to produce a resolved force operating laterally as an outward thrust. Care should be taken to so locate the openings in the tower as to afford them the greatest protection. It was interesting to note that the presence of seaweed was of great advantage in breaking the force of waves. The internal accommodation usually comprised the service-room, which contained the lantern, attendants' room, bedroom, general stores, oil stores or (as the case might be) gas-stove, dynamo-room, &c. A water-tank low down in the base and a crane were also necessary.

The author, in referring to materials of construction, pointed out that, although skeleton towers were often easier to erect than were masonry ones, owing to the difficulty of devising a safe landing stage during rough weather, and also to the impossibility of fixing any floor below the highest probable wave crest, accommodation was greatly hampered, if every high tower were not otherwise necessary. For masonry structures, the granites, syenites, and porphyries were the most useful stones. In some situations the use of concrete had much to recommend it, and if only the difficulties of cracking could be obviated, there was no doubt but that the material would be more largely used. Besides the popular theory of expansion and contraction, the possibility of some sudden chemical change in the later portions of the settling process producing a disruptive molecular disturbance, or, perhaps, of the mass being in itself in such a state of initial tension or compression that it was sensitive to ætherial or seismic tremors which would not affect a more resilient material, were advanced to account for the cracking of mass concrete.

The invention of the Argand burner (1870) marked the commencement of the concentrative systems which, starting with oil, had probably reached their maximum intrinsic brightness in the electric arc. The Trinity House oil burners were generally of the five or six concentric wick type, with intervening air spaces, the outer diameter of a six-wick lamp being 4¾ in. A greater number of wicks was sometimes used, but the heat from them was enormous. A seven-wick lamp consumed about a gallon of oil per hour. The oil in the lamps was supplied under pressure by gravitation, air, or hydrostatic head, or by clockwork pumps. The introduction of incandescent mantle burners had given a fresh impetus to oil illumination. The two principal systems were the oil gas and the petroleum vapour. In the former the oil was vapourised at a shore station, and the gas compressed to ten or twelve atmospheres; the burning pressure was usually 2 lbs. to 3 lbs. per square inch, the consumption ½₆ cubic foot per unit candle of flame intensity at one atmosphere. From the fact that, among others, the French 5th order occulting light at St. Nazaire was left unattended during the night, the system seemed quite reliable. The apparatus costs about 800*l*. In the petroleum vapour system the oil, under a pressure of from two to three atmospheres, was forced through a vaporiser which was heated by the burner itself, after lighting; the consumption was about 8 grains per unit candle. This system was not so easy to work as was the oil gas, but it required less apparatus. The electric light had many disadvantages, and except in a few cases, could not be said to warrant the increased expenditure over other methods. Its glare made it very unpopular with mariners, and it was also deficient in penetrative power through fog, owing to its containing so large a quantity of highly refrangible rays. The proportionate reduction in a thick fog was four times greater than gas. Oil and gas were about equally affected by atmospheric condition. In fine weather the present arrangements were

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quite sufficient, but at the first sign of mist they were practically useless, and it was in this direction that future improvement must be looked for. The extensive use of coloured lights was impossible, owing to the great absorption of light in passing through the screens. Taking white light as of unit intensity, red was $\frac{1}{3}$, green $\frac{1}{5}$, and blue $\frac{1}{7}$. Red was, therefore, the only permissible colour from an economic point of view; it also possessed the advantage of being less easily absorbed than white light in foggy weather. The introduction in 1890, by the late M. Bourdelles, of the mercury float mechanism was a great point of progress, and by it, in the feu éclair or lightning flash system, a far more powerful beam and quicker flash was made possible by the faster rotation of a less extensive lens field. The conclusion of the paper was devoted to the consideration of optical arrangements. The great superiority of the dioptric and catadioptric glass lens, over the older catoptric or metal reflector system was an established fact, and it was now possible to totally reflect or refract nearly every ray issuing from the source of illumination into a useful path. Messrs. Alan Brebner, N. G. Gedge, G. Robus, P. J. Waldram, A. W. Marshall, W. E. Lilly, and A. W. Tyler took part in the discussion which followed the reading of the paper, and the proceedings closed with the announcement of the ensuing meeting on May 2, when a paper would be read by the Hon. Librarian, Mr. Lewis H. Rugg on "Some Factors in Colonial Railway Construction."

COMPETITIONS.

LIVERPOOL CATHEDRAL.—At a meeting of the Liverpool Cathedral Committee, on the 14th inst., it was decided to invite two eminent architects to act as the advisers of the committee in the selection of architects who will be invited to submit designs for the cathedral and in the ultimate choice of the design. The names of the two gentlemen will not be made public until their consent has been received, but it is stated that one represents the Gothic and the other the Classic school of architecture.

HOUSING OF THE WORKING CLASSES, BATTERSEA.—The Battersea Borough Council recently invited competitive designs of houses for the working classes, consisting of five types of houses, as follows:—

1. A house of two stories containing not more than five rooms and scullery, &c.
2. A house consisting of two self-contained tenements containing three rooms and scullery, &c., on each floor.
3. A house consisting of two self-contained tenements containing four rooms and scullery, &c., on each floor.
4. A house consisting of three self-contained tenements containing three rooms and scullery, &c., on each floor.
5. A house consisting of three self-contained tenements containing four rooms and scullery, &c., on each floor.

The instructions were furnished to 106 architects and fifty-eight sets of designs were received. On January 31, the committee met and received these designs, and subsequently appointed Mr. T. Blashill, late Superintending Architect, London County Council, as an expert to assist the committee in the matter. The committee on several occasions conferred with Mr. Blashill and carefully examined the various points connected with the designs of the competing architects. Having in view the number and class of designs submitted they were in favour of awarding four extra premiums of 10*l.* each in addition to those of 50*l.*, 25*l.*, and 10*l.* already agreed upon, and having obtained the authority of the Council in the matter the committee came to the following decisions, viz.:—

(*a*) That the authors of design No. 37 have submitted the best set of designs, particularly as to the cottage and the four-room tenements, and we have awarded the first premium of 50*l.* to Messrs. G. T. Smith & Weald, of No. 10, Guildford-place, London, W.C.

(*b*) That the author of design No. 12 is the next in merit, particularly as to the three-room tenements, and we have awarded the second premium of 25*l.* to Mr. J. Sydney Bucklesby, of "Fairbairn," Kingston-road, Merton, Surrey.

(*c*) That the author of design No. 21 is the next, particularly as to the four-room tenements, and we have awarded the third premium of 10*l.* to Mr. H. Bertram Tarrant, of No. 27, Devereux-road, Wandsworth Common, S.W.

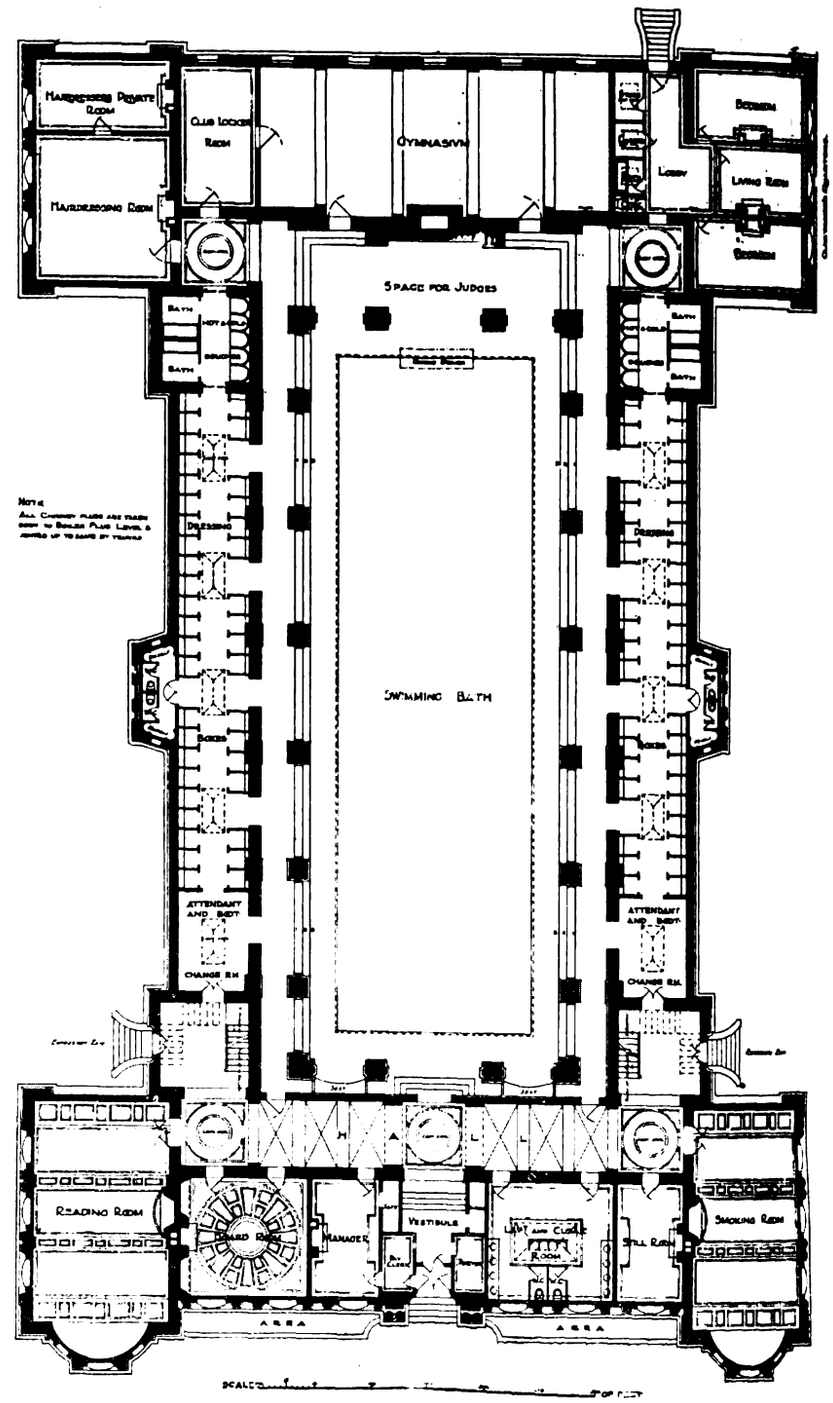
(*d*) That the authors of the following designs (placed in the order of their number) be awarded the extra premiums of 10*l.* each upon their consenting to allow the designs to become the absolute property of the Council—the condition already attached in cases (*a*) (*b*) (*c*).

No. 4.—Messrs. Haigh & Spencer, of 19, Spencer-road, Wealdstone, Middlesex.

No. 8.—Mr. W. G. Lewton, of No. 6, The Forbury, Reading.

No. 19.—Mr. William West, of No. 19, Craven-street, Strand, W.C.

No. 23.—Mr. F. J. W. Goepel, of No. 36, Bulwer-road, Leytonstone, N.E.



Design for a Swimming Bath. Plan.

Arrangements are being made for the whole of the designs to be exhibited at the Municipal Buildings, Lavender Hill, from Monday, April 21, till Saturday, April 26, inclusive, during the following hours:—Monday, Tuesday, Thursday, and Friday from 2 p.m. till 9 p.m.; Wednesday and Saturday from 2 p.m. till 5 p.m. A copy of the report of the Committee also may be seen on application.

Illustrations.

"THE APOTHEOSIS OF COLBERT": DESIGN FOR TAPESTRY.

THIS is a reproduction from the cartoon drawn by the eminent French painter, M. Jean Paul Laurens, for execution in tapestry at the Gobelins National Manufactory of France. The design is one of two cartoons commissioned from M. Laurens by the Municipality of Paris, and which are to be reproduced at the Gobelins, at the cost of the State. The other cartoon, not yet taken in hand, is to represent the group of Jansenist philosophers of the Port Royal des Champs. The two tapestries are ultimately intended as decorations for the Salle des Fêtes of the Mairie of the XIIIth arrondissement, which is near the Gobelins factory.

Colbert, the great and enlightened Art Minister under Louis XIV., was the founder of the Gobelins tapestry works, and there is therefore a suitable motive for his commemoration in a Mairie closely adjoining an institution of his own creation. To English eyes it cannot be denied that the foreshortened seated figure of Colbert, on a larger scale than the other figures, and realistically clad in the costume of the period, has a somewhat absurd effect among this crowd of allegorical and nude figures. The French are so much more used to the idea of "apotheosis" subjects that this incongruity would probably not strike them in the same way. Apart from this point, the design is a very fine one in a decorative effect, both in the treatment and grouping of the figures and in the subsidiary ornamental detail; and it is, moreover, exceedingly well adapted for tapestry.

DESIGN FOR A SWIMMING-BATH.

THIS is a design made in competition for the Soane medallion this year, and which obtained for its author, Mr. E. Vincent Harris, an "honourable mention" in the competition. We give the plan, and the interior perspective of the bath.

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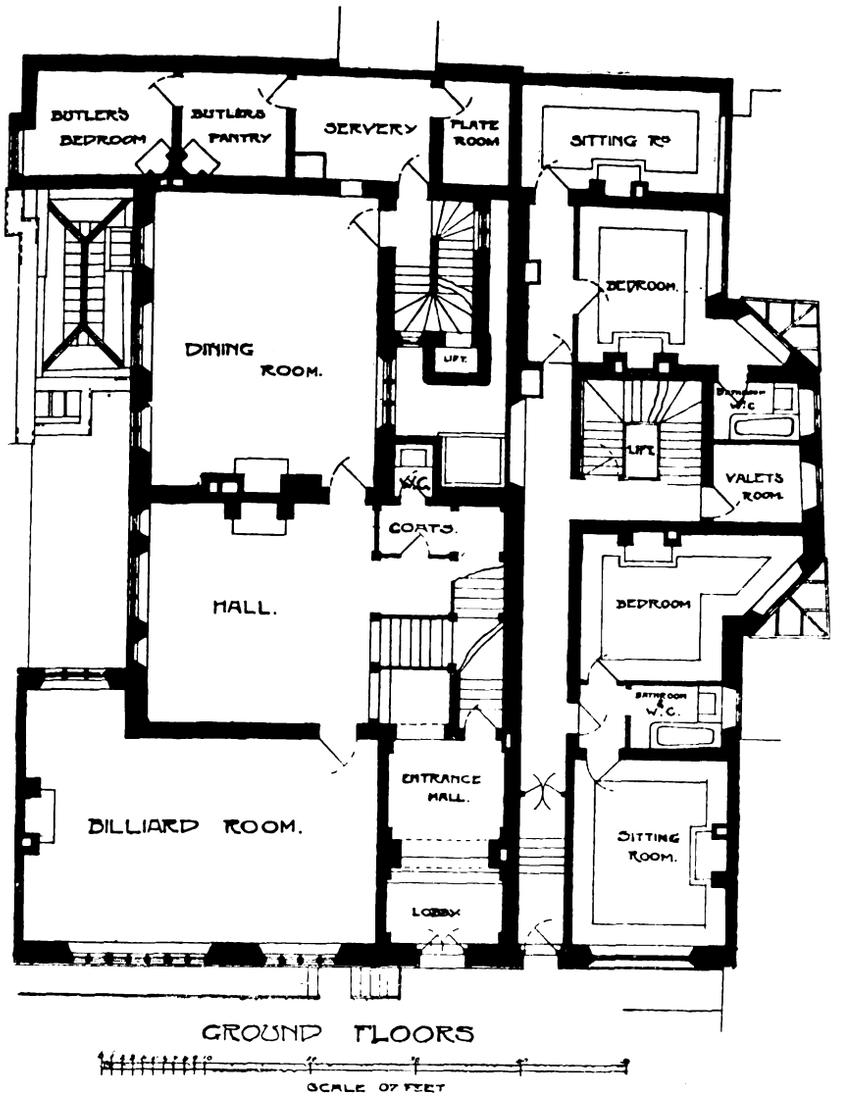

Two London Houses. Plan.

The following is the author's description of the design :—

"In this scheme I have adopted the excellent system existing in some of the most modern German baths, of having a boot-changing room as ante-room to the dressing-boxes, where each bather leaves his boots and receives a pair of indiarubber shoes in exchange ; in this way the soiling of the sides of the pond is obviated. At the end of each set of dressing-boxes a hot and cold douche room is provided. Another advantage is that the competitors in swimming exhibitions would be able to reach the diving end without interfering with spectators at the side. Of course, one knows that in baths, generally, top light is considered the best ; but as the question of light has been carefully considered, and it is ample for all requirements, it was thought that a barrel roof without lights gave a more architectural effect."

WEST FRONT AND TOWER, CAUDEBEC-EN-CAUX.

CAUDEBEC-EN-CAUX is a picturesquely situated town on the banks of the Seine, about midway between Havre and Rouen. The present church, built on the foundations of one that Eudes-Rigaud had dedicated to Saint Marie in 1267, was commenced in the Gothic period and finished in the Renaissance.

The main western entrance, saving some additions, was entirely built in the sixteenth century. It consists of three doorways, the two side ones resembling somewhat those of Saint Maclou at Rouen. The work is very rich, the central doorway having three ranges of statues representing the Saint and the Twelve Apostles.

Although in the early part of last century the church underwent extensive restoration, portions of the west front are still in a very dilapidated condition.

The church contains many interesting and striking examples of the Late Gothic period, and has also some fine stained glass.

C. W. S.

TWO LONDON HOUSES.

THE drawings show the elevations of two houses near Piccadilly. The larger, a town house, is built throughout of Portland stone ; and the smaller, which comprises six sets of bachelor chambers, is built entirely of red brick.

The buildings were erected by Messrs. Simpson & Son, of Paddington, from the designs and under the supervision of Mr. C. J. Harold Cooper, architect.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The annual meeting of this Society was held on the 10th inst. at the Lecture Hall of the Philosophical and Literary Society, Mr. T. Winder presiding. The Treasurer's statement of accounts and the Auditor's report showed that although a large expenditure had been incurred during the past year in the furnishing and lighting of the new rooms, there was the satisfactory balance of 64*l.* in hand. A hearty vote of thanks was accorded to the officers and Council for their valuable services during the past year. The fifteenth annual report of the Council stated that the membership numbers 111, consisting of 35 Fellows, 35 Associates. 20 students, 18 lay, and 3 honorary, members. "During the past year," the report went on, "the Highway Committee has prepared for submission to the Local Government Board a new set of by-laws with regard to new streets and buildings. Your Council, acting on behalf of the Society, expressed its willingness to assist the Local Authorities in the framing of regulations tending to the improvement of sanitary conditions and better construction of houses and other erections within the city. As a result, draft copies of these proposed by-laws were sent for the consideration of your council. The proposed alterations and additions to the present by-laws were very extensive, and in many cases impracticable. It was thought that although framed with a desire to promote the erection of better and more substantial buildings, many of the clauses would seriously hamper the design and planning without yielding satisfactory results either from a sanitary or constructive point of view. Your council appointed sub-committees to deal with different portions of the by-laws, and afterwards held several long meetings, at which all the points raised by these committees were discussed. Finally, a conference was arranged with the Highway Committee, and two long interviews took place on October 10 and 14, 1901. At these meetings the whole of the objections and alterations suggested by your Council were discussed in detail, and several matters of a practical nature were left over to be arranged at meetings between the President and Messrs. J. Smith, J. Wigfull, and the City Surveyor. The Highway Committee promised to give careful attention to the points raised by your Council, and also promised that the proposed by-laws as revised should be sent to your Council for consideration ; but up to the present time nothing further has been heard of the matter. The Council hopes that the views placed before the Highway Committee at those meetings will result in a practicable and workable set of by-laws before they are sent to the local Government Board for approval, as otherwise it may be advisable that this Society should place its objections before the Local Government Board. Arrangements have been made for the acquisition of rooms in the premises of the Literary and Philosophical Society, Leopold-street. With reference to the Highway Committee's proposals as to area lights in the footpaths referred to in the last annual report, nothing further, apparently, has been definitely decided by that committee ; but the Council understands that the committee will approve of plans for area lights on condition that the owners enter into an agreement to be responsible for their maintenance and repair." The report was adopted. The ballot for the election of officers resulted in the following appointments :—President, Mr. P. Marshall ; vice-president, Mr. T. Winder ; treasurer, Mr. Fred Fowler ; hon. secretary, Mr. W. C. Fenton ; Council, Messrs. J. Smith, R. W. Fowler, C. Hadfield, E. Holmes, J. B. Mitchell-Withers, H. L. Paterson, J. R. Wigfull (Fellows), C. B. Flockton, C. M. Hadfield, and C. F. Innocent (Associates). The Society's prizes for measured drawings were presented to Mr. G. R. Morris and Mr. D. B. Jenkinson.

WORCESTER DIOCESAN ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.—Earl Beauchamp presided at the annual meeting of this Society on the 10th inst. The accounts showed a balance in hand of 44*l.* 14*s.* 1*d.* A communication was received from the Archæological Society offering to support the Worcester Society in any action as to the proposed disposal by the Ecclesiastical Commissioners of Hartlebury Castle, and the chairman thought the letter could lie on the table. As far as he knew there was no intention of making any structural alteration at Hartlebury. When there was it would be time to take action. The hon. secretaries (the Revs. J. K. Floyer and G. H. Poole), the librarian (Mr. A. B. Pinckney), the treasurer (Mr. F. R. Jeffery), and the Auditor (Mr. E. Day) were re-elected. It was proposed by the Chairman that the Bishop should be asked to continue the patronage of the Society by the head of the See, and should be informed of "the intimate relations that once existed between the Society and the authority for granting faculties," leaving it to the Bishop to say whether it would be an advantage for some members of the Society who had archæological knowledge to see the plans submitted for church restoration, in order to prevent vandalism. The Chairman said a great deal of harm was done by excellent and well-meaning people, who in their desire to make churches more beautiful took away something that was beautiful and put in its place some machine monstrosity.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—A paper on the Building By-laws

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of Plymouth was read recently by Mr. Arthur S. Parker to members of the Three Towns Branch of the Devon and Exeter Architectural Society, who met in the modelling-room of the Plymouth School of Art. Mr. H. G. Luff, President of the Society, presided. Mr. Parker said that the Plymouth by-laws are largely a copy of the model by-laws of the Local Government Board, with some omissions, and with certain additional regulations. In reference to the modified code recently issued by the Local Government Board, no proper allowance is made for sanctioning temporary iron churches, chapels, or schools, although such facilities are clearly desirable for stated periods to enable congregations to be formed preparatory to the erection of permanent buildings. The isolation of 30 ft. required for exempted buildings of over 15 ft. in height necessitated a larger site than was needed for permanent structures. An isolation of 10 ft. or 12 ft. should amply suffice to satisfy the idea of iron buildings catching fire, instead of 30 ft. The model code in respect to the formation of new streets was inadequate for large towns. The minimum width of 36 ft. generally followed has produced miles of streets throughout England insufficient for modern traffic, including tramways, especially where such streets are main arteries to adjoining districts. The widths have recently been increased in the Plymouth by-laws, but without reference to such streets being tributary or main thoroughfares. In hilly towns, such as Plymouth, the absence of a limit of gradient in the formation of new streets has allowed landowners the liberty of arranging their streets at right angles with the slope of the hill, instead of being laid obliquely to lessen the incline. As streets, once formed, are permanent, the results to successive generations are infinitely more important than the convenience of building owners. It is to be hoped that an alteration of opinion, before many years have elapsed, may cause a less number of sewer ventilators in the main streets, especially in new estates, with further provision for proper elevated shafts. A stone wall 2 ft. 6 in. thick at its base, is required to have a foundation footing at least 5 ft. wide, without reference to the nature of the ground in the district. This by-law was evidently made in London with a clay soil in view, but it was quite unreasonable for a rock district such as Plymouth. The Plymouth by-laws with regard to the walls of a domestic building 25 ft. high are properly set forth, but if the building contain three stories, if it be only an attic in the roof and walls of the same height, yet the whole wall, if in brickwork, is unnecessarily required to be thickened; also if the wall be higher than 25 ft., as necessary in the end walls, the increase is required for two floors instead of one. This regulation adversely affects the cost of small houses for the working classes having two stories with an attic. It is also to be observed that a recently-added regulation in the Plymouth by-laws, not contained in the model code or in most other by-laws, requires that all habitable rooms are to be not less than 9 ft. in height. Although the object may be good—to classify tenement rooms, and especially attics or rooms in the roof with the general rooms—the lecturer held that this was an unnecessary restriction, and it was not even held to be essential in London. The result is that it is now impracticable in Plymouth to utilise the roof space in houses of ordinary span, without the use of a mansard roof for the additional accommodation which could otherwise be provided at a very small first cost. The forming of such rooms is a distinctly practical way of relieving overcrowding. It would in most cases allow provision for the separation of sexes in sleeping apartments. The cost in fitting up attics is clearly small, but roughly one-twentieth of the cost of house and site, whilst adding one-fourth more accommodation. Mr. Parker said it would also be well on the score of economy that modern opening skylights be acknowledged in by-laws. Much thought is given by borough authorities to devise workable schemes for the housing of the working classes, but little thought is given to the removal of hindrances in their own by-laws. Again, walls for an outhouse 5 ft. long by 7 ft. high are required to be 18 in. thick for stone, or 9 in. for brick, by not being separately classed from main structures. The great strengh and economic use of buttresses for strengthening walls is practically ignored in the schedule of wall thicknesses for warehouse and public buildings, notwithstanding the standing proofs in ancient buildings. The by-laws most affecting the vital interests of the town are those relating to the requirements of open spaces at the rear of buildings. Public buildings, warehouses, factories, churches, breweries, and public halls are not compulsorily required to have open spaces, the meaning of this exclusion being that they are not habitable dwellings. The requisition is applied to nominally one class of building, defined as "domestic," but, as a matter of fact, this by-law term includes every other kind of building not of the public building or warehouse class. It therefore includes numerous buildings inhabited to a much less extent than factory buildings, and quite apart from domestic use. These by-laws are not qualified in Plymouth as to the nature of use for which the building is constructed, nor for variations in districts or areas as provided in some towns, nor is there consideration given to buildings abutting on old streets formed before by-laws were made, as provided for in London. Nor is there any equitable rule whereby an efficient air space can be obtained by means which do not unduly damage the value of the site, such as a full width space at the rear above the ground floor of business premises of shallow depth, such as is clearly set forth in the London Building Act. On the contrary, lock-up shops with offices over, re-erected on old sites in the very heart of the town, are required to be treated in precisely the same way as domestic dwellings in Laira or Compton, with an open yard or garden at the rear on the street level, notwithstanding that all the virtues of open space for air can be obtained over shop or ground-floor levels. The consequences are that persons owning property in the chief streets—especially where the site is not of great depth—are unable to rebuild at all without losing one-third or even one-half the ground area of their valuable premises. Consequently restoring and patching the old premises have to be resorted to instead of rebuilding. The street architecture of Plymouth is of a poor character for a town of its size and importance, and there is but limited chance of improvement while the present by-laws remain in force. Four classes of buildings for adopting different methods of obtaining air spaces can readily be defined:—(1) new dwelling-houses, with a proviso for workmen's dwellings; (2) new buildings containing lock-up shops, warerooms, offices, or counting-houses; (3) re-erected buildings abutting on old streets constructed before a given date; (4) stable buildings. The latter are now classified with domestic buildings, and required to have the yard space in the rear, thus involving the provision of two yards, one always being required at the entrance for washing and usual stable purposes, and the unnecessary one at the rear. Each of the four classes of buildings named need classification in respect to air spaces, at the same time maintaining the principles of circulation of air. There is need for public interest and pressure to be brought on the Council to revise certain portions of the by-laws to suit local requirements. In conclusion, Mr. Parker expressed a wish that in some future Act of Parliament the question of damage to ancient lights might be settled by an appointed assessor, when the plans were submitted to local authorities, and before new buildings were erected, so as to avoid the cost and waste of time involved in litigation, and to minimise one of the obstacles to building improvements. A discussion followed, in which Messrs. Littleton, Leest, and Priestley Shires, took part.

CARDIFF, SOUTH WALES, AND MONMOUTHSHIRE ARCHITECTS' SOCIETY.—On the 11th inst. at the South Wales and Monmouthshire Art Society Rooms, Cardiff, Mr. A. G. Legard, H.M. Inspector of Schools, lectured before the Cardiff Architects' Society on the designing and building of schools. Mr. E. W. M. Corbett presided. The lecturer dealt in the first place with the schoolroom, and in this connexion referred with gratification to the fact that opinion was coming round in the direction of smaller classes. The ideal schoolroom for a class of from forty-two to forty-eight should be about 30 ft. long by 13 ft. in height, while the width should be determined by the amount of light available from the windows. Dealing with the question of schools in towns, the lecturer urged that the model town school should have accommodation for not more than about 400 children. Great importance was to be attached to proper ventilation, for the reason that foul air caused children to suffer from lassitude, with the result that they could not do their work properly, while the teachers suffered even more than the children.—The annual dinner was held at the Park Hotel, Cardiff, on the 12th inst. Mr. E. W. M. Corbett (President of the Society) was in the chair. The loyal toasts having been proposed from the chair and duly honoured, Mr. Geo. Thomas gave "Our Pastors, Legislators, and Defenders," to which the Rev. A. Henderson and Captain Dashwood Caple responded. Mr. E. Seward submitted "The Royal Institute of British Architects," with which he coupled the name of Mr. W. Emerson, President of the Institute. Mr. Emerson had just returned from India, where he had been summoned by Lord Curzon for consultation upon the Queen's memorial to be erected in India. Mr. Emerson, in the course of a short address in response to the toast, urged upon architects the desirability of combination through the Institute and its allied branches. England was behind every other European country in the education of architecture, and one of the chief objects of the Institute and its members should be to educate the public in its appreciation of what was best in architecture. They wanted, also, to educate architects themselves to have some self-respect and *esprit de corps*, especially upon the burning question of competitions. All sorts of competitions were started by public bodies nowadays, and many of them were grossly unfair. There seemed to be a large number of architects ready to rush into any competition, and they made their work so cheap that they seemed to be ready to cut one another's throats. While they did that they could hardly expect the public to value their work as it ought to be valued, nor was it to be wondered at if public bodies expected them by these competitions to turn out their work as if they were machines. Architects should not enter competitions unless those asking for them were prepared to pay a proper fee for each set sent in. Another matter that the Institute had under consideration was the appointment of assessors, whose assistance in competitions had been valuable. Architects suffered a great deal from rush of work. They wanted more time for reading and study. They ought to spend more time in this way, and to learn the lessons that were available in nature—in the colours, in the flowers, in the valleys, and in the hills. They ought to aim at a love of the beautiful. If they did that they would no more sit down and design some of the things to be seen in the streets of large towns than they would design a warehouse and call it a palace.—Dr. C. T. Vachell proposed "The Cardiff, South Wales, and Monmouthshire Architects' Society," with which he coupled the name of the chairman. In the course of his remarks he said that he wished architects would not design the horrible little grates sometimes found in bedrooms. They ought to remember that in cases of sickness it was sometimes necessary to have a fire in the bedroom all night, but many of the grates held fires that would not last two hours.—Mr. E. W. M. Corbett hoped that the effect of the visit by the President of the Institute would be to lead local members to take more interest in the Society. Architects ought to realise the value of combination, especially as there was a section of the public that dabbed in bricks and mortar and became a source of possible difficulties. "The Local Governing Bodies" was proposed by Mr. J. Carter Coates, and responded to by Alderman David Jones. Mr. F. R. Kempson gave "The Master Builders," to which Mr. George Couzens replied.

ARCHITECTURAL ASSOCIATION OF IRELAND.—The annual dinner of the Architectural Association of Ireland was held at the Grosvenor Hotel. Mr. C. J. M'Carthy, City Architect, presided. The toast of "The King" having been duly honoured, the Chairman proposed the toast of "Our Guests," coupling with it the names of Mr. Rawson Carroll, Mr. Pile, and Mr. George Coffey. All three gentlemen replied, and Mr. W. Pile, speaking on behalf of the Master Builders' Association, said he condemned the importation of strangers into Dublin to do the work of architects and builders which could have been done as satisfactorily by men belonging to their own city. Mr. J. Rawson Carroll, in proposing the toast of "The Architectural Association," said the senior members of the profession had every reason to be proud of the Association. Their Association had the thorough support of the

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Institute of Architects. In his opinion the public were realising the position of the architects now better than they had heretofore, and the Association might, therefore, look forward with hope to the future. The Chairman, in expressing thanks on behalf of the Association, said that although the Association had been only six years in existence it had had a fair measure of success, and had done much for the advancement of the profession.

ARCHÆOLOGICAL SOCIETIES.

SOCIETY OF ANTIQUARIES OF SCOTLAND.—The usual monthly meeting of this Society was held in their library, at the museum, Queen-street, on the 14th inst., Mr. Robert Munro, M.D., LL.D., in the chair. The first paper was a notice of the heraldry in some of the old churchyards between Tain and Inverness, by W. Rae Macdonald, F.S.A., Scot. Beginning with the burial slabs in the roofless ruin of the ancient church beside the old Collegiate Church of Tain, two of which show shields of arms of the family of Ross, he next noticed the tomb of Finlay M'Leod, Abbot of Fearn, in the Abbey Church of Fearn, which has still the effigy of the Abbot under an arched and decorated canopy, with a shield in the centre bearing his arms, and two smaller defaced shields at the sides. Near the centre of the north wall of the church is a shield with lion rampant, and at the east end a Balnagoun monument of the eighteenth century. At Nigg, besides the Celtic sculptured stone, there is a recumbent slab with a Gothic cross and sword, which has been used a second time for a shield of arms of Alexander Gair, 1659. At Invergordon Castle is the fine Celtic slab from Hilton of Cadboll, which was also utilised a second time for an inscription on one side commemorating Alexander Duff and his three wives, 1676, with a shield of arms. In the churchyard of Gilchrist, near the Muir of Ord, is a stone with some unusual mortuary devices, and at Killearnan a mural tablet with arms of the Mackenzies of Muirtown. In Kilcoy Castle is the sculptured heraldic mantelpiece of the hall, the decoration of which consists of three shields of arms enclosed by circular bands on which the mottoes are incised, while at either end is a mermaid playing on a harp. The arms on the shields commemorate certain marriages in the family, and the date is 1679. Several shields of arms also occur among the external decorations of the castle, and in the drawing-room there is an interesting oak cabinet with heraldic decoration, which is said to have been carved by Master Alexander Mackenzie. Against the garden wall is a large heraldic panel, said to have been brought from the Bishop's Palace, Fortrose, bearing the full achievement of Scotland and the arms of Bishop James Hay, 1537. At Redcastle there are several heraldic sculptures, one of which is interesting as resembling the arms of Finlay M'Fead, Abbot of Fearn. At Fortrose are three canopied tombs and several stones with interesting heraldic sculptures, which, as well as those at Rosemarkie, were fully described. In the second paper Mr. John Fleming gave a notice, illustrated by photographs, of a well-preserved stone-built fort near the Mull of Kintyre. It is a circular structure, massively built, and situated on a rocky knoll overlooking the sea, and fully 300 ft. above the shore, while it also overlooks a glen called Borgadaill—doubtless so named after the fort. The circular wall, which is about 12 ft. thick, encloses an area of about 36 ft. in diameter, and still stands to a height, in some parts of its circumference, of 7 ft. or 8 ft., though the inside level is higher, and the wall nowhere shows more than about half the height of the outside. The doorway is on the north-west, and is about 3 ft. 6 in. wide at the outside and about 1 ft. wide at the inside face of the wall. There are no signs of chambers in the thickness of the wall, but there are apparent traces of buildings within the enclosed area. In the third paper Mr. Thomas Ross, architect, F.S.A.Scot., gave a description of four stones found at various places in the neighbourhood of Auchterarder, which appear from their similarity of subject to belong to one group, their common characteristic being that they represent riders in chariots drawn by horses, leopards, or other animals. The best preserved example belongs to Mr. A. Drummond Forbes, Millearn House, and is inscribed Luna, with the personified representation of the moon in her chariot. Another well-preserved example, which is in the Perth Museum, appears to have had a similar personification of the sun; while a fragment in the same museum shows a mutilated head with the inscription "Mercurius"; and at the ruins of Auchterarder Castle there is a stone, rather wasted from exposure, but still distinct enough to show that it belongs to the same class of representations. In the next paper, Dr. Christison, secretary, gave a notice of an unrecorded fort and a stone circle at Wester Torrie, near Callander, Perthshire. The fort is situated in the parish of Kilmadock, below the junction of the Keltie with the Teith, and close to the south bank of that river. In the last paper, Mr. James Barbour, F.S.A.Scot., gave an account of the excavation of a quadrangular earthwork with rectilinear sides and rounded corners at Rispain, in Wigtownshire, which is locally known as Rispain Camp, and had the reputation of being a Roman camp.—*Glasgow Herald.*

BOOKS RECEIVED.

A HANDBOOK OF HYGIENE. By Colonel A. M. Davies, M.R.C.S., &c. Second edition. (C. Griffin & Co.)

THE BASES OF DESIGN. By Walter Crane. New edition. (George Bell & Sons. 6s.)

THE HEALTH OFFICERS' POCKET-BOOK. By E. F. Willoughby, M.D. Second edition. (Crosby Lockwood & Son. 10s. 6d.)

LIGHT AND AIR. By the late Professor Banister Fletcher. Fourth edition, revised. (B. T. Batsford.)

THE PREVENTION OF DAMPNESS IN BUILDINGS. By M. J. Salter, F.I.C., F.C.S. (Scott, Greenwood, & Co.)

THE BUSINESS ENCYCLOPÆDIA AND LEGAL ADVISER: ABA to CON. By W. S. M. Knight, Barrister-at-Law. (Caxton Publishing Co. 7s. 6d.)

OUTLINE OF THE LAW RELATING TO WORKMEN'S COMPENSATION ACTS 1897 and 1900. By William Bowstead. (Simpkin Marshall, & Co. 1s.)

PATTERN-MAKING: A PRACTICAL TREATISE. By Joseph G. Horner, A.M.I.M.E. Third edition. (Crosby Lockwood & Son.)

Correspondence.

RE INSTITUTE OF BUILDERS AND CONDITIONS OF CONTRACT.

SIR,—The attention of the Council of this Institute has been called to a paragraph in your issue of the 22nd ult., under the heading of "Notes"—"Form of Building Contract," and as they consider the statements contained therein misleading they ask that you will give the same publicity to the following observations.

The Council suggest that it would have been fairer if you had printed the Institute Annual Report *in extenso*, instead of simply making a reference to a statement contained in it.

The writer of the "Note" has entirely misunderstood the objects and intentions of the Council, who recognise quite well the inconvenience and trouble which might arise if the architect were not, during the progress of the works, to have full control in regard to workmanship and materials, and are quite willing it should be so; but that being conceded, they contend that it is only just that the architect must take the responsibility of what he does in this direction, and if he acts unjustly the builder must have his remedy. This, however, he is effectually deprived of by exempting Clause 16 from the consideration of the arbitrator, as decided by the architects at the general meeting in December, 1900, and which appears to meet with the unqualified approval of the writer of your "Notes." If the Arbitration Clause in the Form of Conditions now issued by this Institute is referred to it is quite clear that the contractor cannot do as you say—*i.e.*, bring in the arbitrator upon every trifling dispute between the architect and himself during the progress of the works.

Provision, however, is made so that if the arbitrator has to determine, at the completion of the contract, whether the builder in this respect has been put to extra cost beyond the cost properly attending the carrying out the contract in accordance with the plans and specification, he (the arbitrator) shall have an opportunity of seeing for himself, at the only time it is possible for him to do so, whether the claim is a reasonable or proper one or not.

There is a third party, not referred to in the "Note" in question, viz., the employer, and this fact should not be overlooked. The Council are content to rely on the principles of equity in settling the terms of a contract, without reference to the possibility or probability of dishonesty on the part of any one of the parties interested.

THOMAS COSTIGAN.
Secretary, Institute of Builders.

*** We print the letter of the Institute of Builders, but we deny that there is any misrepresentation. What the builders want is that they are to bring in another man to look at materials which the architect has condemned, with a view to giving judgment afterwards that they ought not to be condemned. Some builders go further than this; they would like to arbitrate everything on the spot; we have no doubt of what we are saying, as we have been told so by a large contractor. This kind of insidious attempt to overset the architect's authority ought in our opinion to be resisted by architects in the firmest manner. The architect was formerly master on his building; the builder now wants to be master, and that just at a time when, owing to the system of pricing and estimating from highly elaborated Quantities, contractors are tending more and more to cease to be builders in the true sense, and to become only building financiers. So far from modifying or withdrawing our expressions, we desire only to repeat them with the greater emphasis.—ED.

NEW MALDEN MUNICIPAL BUILDINGS COMPETITION.

SIR,—No doubt your readers, and particularly the competitors, will be interested in the enclosed cutting from the *Surrey Comet* of the 5th inst. What is the profession coming to? —

"PLANS FOR THE OFFICES.

Letters were read from five selected architects, offering to prepare designs for the proposed public offices, at fees ranging from forty to sixty guineas. After discussion, it was decided to make further inquiries from three of the architects."

ACETYLENE.

The Student's Column.

PART II.—DRAINAGE.

CHAPTER 14.—MANHOLE COVERS AND VENTILATION.

MANHOLE COVERS.—Manholes are sometimes covered with slabs of stone, but these are somewhat difficult to take up and replace. Iron covers are much more convenient, and are now generally used. In shape they may be round, oval, square, or oblong. The sizes range from 6 in. in diameter for lampholes or pipe-shafts to about 3 ft. by 2 ft. for large manholes. There are two principal classes of covers—ventilating and air-tight. Unless other means of ventilation are provided, as shown in fig. 43, ventilating covers must, as a rule, be fixed over intercepting chambers, whether these are on the main drain or on the branch drains. Where the high-level opening for ventilation is carried up from the intercepting chamber, the cover of this chamber must be airtight, and a low-level opening must be provided near the head of the drain, either by means of a ventilating cover on a manhole or by a grating on a pipe communicating with the drain. The manhole covers on long outfall drains ought to be of the ventilating type. Except in the cases mentioned, the covers ought to be airtight.

The simplest form of ventilating cover is a perforated slab of cast-iron fitted into a rebated stone curb. Instead of the stone curb, an iron frame may be used. The frame ought to be of sufficient depth to allow the surrounding paving to rest on the flanged base, but not in any case less than 3 in. Hinged grates are often used. For roadways, heavier grates are required; fig. 67 shows a common type for sewer-manholes in streets. A dirt-box of galvanised iron may be hung under a perforated cover to prevent sand and other objectionable refuse from entering the drain. In Jones's ventilating manhole-cover (fig. 68), the air-openings are near the rim, and a channel is formed in the frame to receive any dirt which may drop through them.

Airtight covers are of various kinds. As a rule the cover has one or more projecting rims around the lower margin, which fit into corre-

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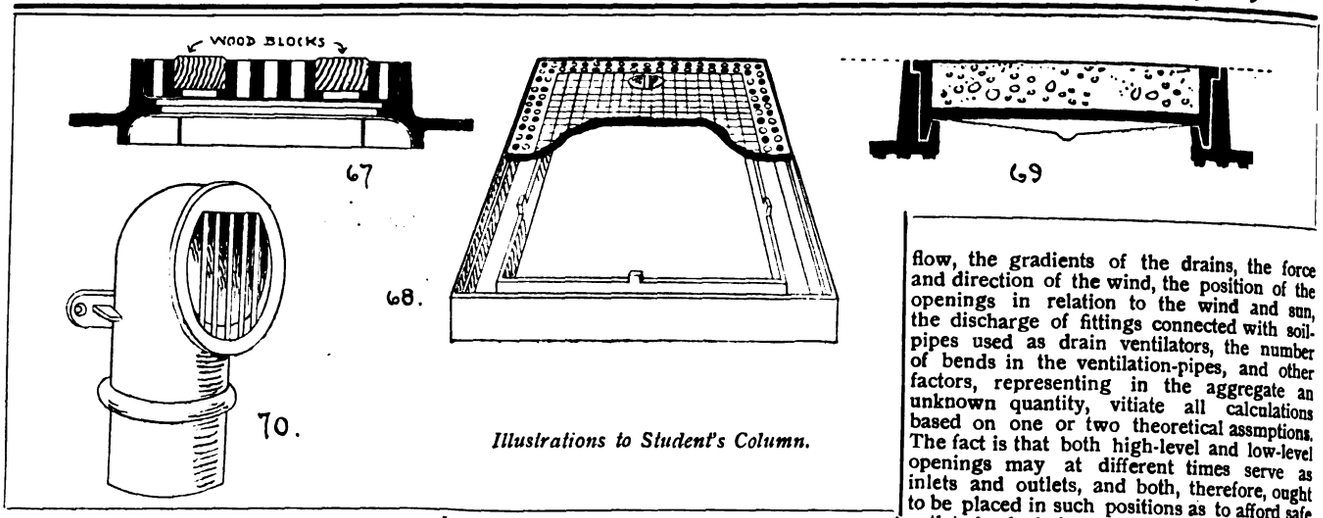

Illustrations to Student's Column.

sponding grooves in the iron frame, as shown in fig. 43. The grooves ought to be filled with Russian tallow; fine sand is sometimes used, but is not as satisfactory. Jones's airtight cover is on the same lines as his access cover for pipes (fig. 65), and has an outer and inner cover; the former fits into the grooved frame in the manner already described, while the latter is arched so that the moisture condensing on it will trickle down to the deep groove in which it rests and form an airtight seal; sand may be placed in this groove, so that a perfect seal may be obtained with a small quantity of water. The depth of seal varies in different covers, but ought never to be less than 1 in. Sometimes the flanged rim of the cover plate rests on a rubber cord placed in a groove of the frame, but such covers cannot be trusted to remain airtight for any long period.

Covers, both airtight and ventilating, are now made with recessed tops to receive concrete, wood-blocks, asphalt, or other flooring material, and are very suitable for use inside buildings, where a large area of ironwork would be unsightly, and in carriage-drives, where the iron might not afford proper foothold for horses. An example is given in fig. 69. It is often desirable to fasten the covers in some way, so that they cannot be removed by unauthorised persons. A simple method consists in securing the cover to the frame by means of gun-metal screws.

Ventilation.—Adequate openings for the inlet and outlet of air are required in drains in order that emanations from the sewage may be diluted and carried away without loss of time. Experiments have shown that foul gases may be absorbed by the water on one side of a trap, and given off again on the other side. In badly-ventilated drains foul air may be forced through the water of a trap when a sudden increase of the volume of sewage occurs, as, for example, during heavy rains. In a similar manner, sewer air may be forced through the intercepting traps of drains. For these reasons, adequate ventilation, not only of main drains but also of long branches, is necessary. In large systems the drains must be divided into sections by means of intercepting traps on the principal branches (see fig. 42), each section being separately ventilated. In small systems, two openings for ventilation will suffice. One of these must be at or near the intercepting trap on the side furthest from the sewer (figs. 41, 43, 64, &c.), and the other must be as near the head of the drain as possible.

The requirements of the Model Urban By-laws may be thus summarised:—

Normal Arrangement.—One opening must be provided at or near the ground level, and must communicate with the drains "by means of a suitable pipe, shaft, or disconnecting chamber" as near as practicable to the intercepting trap, and on that side of it which is nearer to the building. The second opening must be placed "as far distant as may be practicable" from the first, and must be at the head of a vertical pipe or shaft carried up "to such a height, and in such a manner, as effectually to prevent any escape of air from such pipe or shaft into any building in the vicinity thereof, and in no case to a less height than 10 ft."

Alternative Arrangement.—If the normal arrangement is impracticable, the low-level opening may be placed near the head of the drain, and the high-level opening near the intercepting trap.

In either case, each pipe or shaft must be of a sectional area not less than that of the drain with which it communicates, and in any case not less than the area of a 4-in. pipe, and must be furnished with "a suitable grating or other suitable cover," the apertures in which shall have an area not less than that of the pipe or drain. Bends must not be formed in the air-pipes or shafts "except where unavoidable." "The soil-pipe of any water-closet, in every case where the situation, sectional area, height, and mode of construction of such soil-pipe shall be in accordance with the requirements applicable to the pipe or shaft to be carried up from the drains, may be deemed to provide the necessary opening for ventilation which would otherwise be obtained by means of such last-mentioned pipe or shaft."

The Model Rural By-laws although differently expressed, are to the same effect, with the exception that, where a pipe or shaft communicates with a 4-in. drain, "the sectional area of such pipe or shaft may be not less than 3½ in." The words "sectional area" are clearly a mistake for "diameter," the intention undoubtedly being to sanction the use of a 3½ in. soilpipe as a drain-ventilator. A proviso is, however, inserted in the Rural By-laws that (1) no ventilation need be provided for a drain not more than 20 ft. in length, "where there is no water-closet within the building, and connected with the drain," and (2), "where the aggregate length of so much of the drain or drains of a new building, as is above the [intercepting] trap. . . . . shall not exceed 30 ft., and such drain or any of such drains shall not be connected with any water-closet which has internal communication with any building, the opening required by this by-law to be provided at or near the level of the surface of the ground may be dispensed with."

The London drainage by-laws specify three arrangements, the first and second being similar in the main to those described in the Model Urban By-laws, and the third having the two openings at the tops of vertical pipes or shafts. In the first and second arrangements the low level openings must be "*above and near* the level of the surface of the ground," and not "at or near," as in the Model By-laws; and in all the arrangements every high-level opening must be at such a height and in such a position as to afford "a safe outlet for foul air." Soil-pipes from water-closets and slop sinks may serve as drain-ventilators, if the situation, sectional area, height, and mode of construction are suitable, and in any case a soil-pipe 3½ in. in diameter shall be deemed to provide adequate ventilation for a 4-in. drain. If separate ventilation pipes are necessary, they must be constructed "in the same manner and of the same material and weight" as soil-pipes.

Experience has falsified many of the theoretical assumptions on which the practice of drain ventilation was at one time based. The principal assumption was that a low-level opening would usually, if not invariably, serve as an inlet, and a high-level opening as an outlet; but in drains, as in houses, there are so many disturbing influences at work that the assumption can only be regarded as misleading. Numerous experiments on drains and sewers have proved this. The relative temparature and humidity of the sewer air and of the external air, the direction of flow of the sewage, the increase and diminution of the flow, the gradients of the drains, the force and direction of the wind, the position of the openings in relation to the wind and sun, the discharge of fittings connected with soil-pipes used as drain ventilators, the number of bends in the ventilation-pipes, and other factors, representing in the aggregate an unknown quantity, vitiate all calculations based on one or two theoretical assmptions. The fact is that both high-level and low-level openings may at different times serve as inlets and outlets, and both, therefore, ought to be placed in such positions as to afford safe outlets for foul air. Cowls fixed on high-level openings do not materially alter the conditions, and may be regarded as unnecessary; a copper wire guard to prevent the ingress of birds and leaves is all that is required.

Low-level openings must, according to the London Drainage By-laws, be "above and near the level of the surface of the ground." Ventilating manhole-covers are therefore inadmissible, and a pipe must be carried up from the intercepting chamber and finished with a grating a few inches above the ground. The apertures in the grating must be equal in area to the cross-section of the drain. Fig. 70 shows a cast-iron ventilator with brass front. Sometimes mica flaps are placed behind the grating, and are hung at the top or sides in such a manner that they open when the current of air is into the drain and close under back pressure. The flaps are unnecessary unless the ventilator is near a door or window.

In the old by-laws of the L.C.C. it was specified that the open end of a soil-pipe must "in all cases be above the highest part of the roof of the building to which the soil-pipe is attached, and, where practicable, be not less than 3 ft. above any window within 20 ft. (measured in a straight line) from the open end of such soil-pipe," but these provisions are wisely omitted from the new by-laws. To carry a ventilation-pipe above the highest point of a roof involves in many cases a number of bends sufficient to prevent almost entirely the flow of air under normal circumstances. Certainly it is not desirable to terminate a drain ventilating-pipe near to and below a window, but in small drainage systems, properly designed and maintained in good condition, the drains ought not to give off any fouler emanations than those arising from the gully under a sink-waste. Ventilation-pipes ought not to terminate under projecting eaves or gables, nor ought they to be used as rain-water pipes.

Cast-iron ventilation-pipes soon corrode; the rust in many cases accumulates at the foot and chokes the pipe. Rust-pockets ought invariably to be fixed at the feet of such pipes. They are not required if the pipes are of lead.

OBITUARY.

M. COQUART.—M. George Ernest Coquart, the French architect, has died at the age of 71. He obtained the Prix de Rome in 1859 with a design for a Hôtel for invalided sailors. He was a pupil of Hippolyte Lebas, and became successively Sécretaire des Bâtiments, professor at the Ecole des Beaux-Arts, and member of the Institut (in 1888) in place of Questel. He was the designer of the beautiful monument to Henri Regnault at the Ecole des Beaux-Arts, working in collaboration with M. Pascal. He designed also the monument of the Défense Nationale at Père Lachaise, the fine installation of the Cour de Cassation, and the monument to Rougevin, erected in the vestibule of the Ecole des Beaux-Arts. Coquart was an artist in the highest sense of the word; he had, like his countryman Charles Garnier a natural feeling for form and colour, and his instruction at the Ecole des Beaux-Arts was much sought after. He was also an accomplished draughtsman and water-colour artist, and exhibited with success at annual Salons.

MR. J. J. HENDERSON.—We regret to record the death of Mr. John J. Henderson, of Dundee. He was born in Dundee, and educated at the Madras College, St. Andrews. His training as an architect and civil engineer was obtained under the late Mr. Charles Ower, Harbour Engineer, Dundee. He was twelve years in the municipal engineering ser-

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vice of Dundee, Leeds, and Lincoln, and about twenty years ago started business on his own account in Dundee. On many occasions he contributed to the proceedings of the Dundee Institute of Architecture, of which he was hon. secretary for many years. From 1894 to 1897 he served as a Town Councillor, and in 1900 he was again returned to office. In November last he was elected one of the magistrates of the burgh. He was also a Justice of the Peace for the county of Fife.

GENERAL BUILDING NEWS.

NEW MISSION HALL, WESTBOURNE PRESBYTERIAN CHURCH, BELFAST.—The mission hall erected in connexion with Westbourne Presbyterian Church, Belfast, has just been opened. Situated in Cuba-street, facing the Newtownards-road, the hall is built of brick, the style being Gothic. It contains a hall (with seating accommodation for 250 people), cloakroom, and kitchen. The plans were prepared by Mr. John Frazer (Messrs. Frazer & Son), and the building operations carried out by Mr. R. Hewitt, under the personal superintendence of Mr. Robert Black.

NEW U.F. CHURCH, BURNTISLAND, FIFE.—Plans for the erection of a new church for the Erskine United Free Church congregation were approved of by the Dean of Guild Court recently. The design, which was prepared by Mr. J. B. Wilson, architect, Glasgow, comprises a church which will seat fully 500 persons, a hall to accommodate 100, a session-house, a vestry, and a heating-chamber. The site for the new building is a prominent one at St. James's Park. The building will cost about 5,500*l.*, and the successful contractors for the work are:—Masons, Messrs. White & Son, Lundin Links; joiners, Messrs. J. C. Burns & Co., Larkhall; slater and plasterer, Mr. James Williamson, Burntisland; plumber, Mr. James Goodlet, Glasgow; glazier, Mr. James Miller, Glasgow.

CHURCH EXTENSION, YORK.—The chancel of the new Church of St. Luke's, for the district of Burton-lane, has just been consecrated. The church, which is eventually to consist of a nave and chancel, under one continuous vaulted roof, 113 ft. long by 22 ft. wide, has to be built in sections, and it is the first portion which has been consecrated. Mr. Brierley, of York, is the architect, and it is estimated that the completed building will cost 8,000*l.*, and will accommodate 800 worshippers. The section which has been completed consists of the vestries, chancel, and aisles, which will accommodate 300, with a temporary west end which can be taken down when the remainder of the work is proceeded with.

WESLEYAN CHURCH, WALSALL WOOD.—The opening ceremony in connexion with a new Wesleyan Church which has been erected at Walsall Wood took place on the 10th inst. The structure, which has been designed by Mr. C. W. D. Joynson (Wednesbury), has been erected by Mr. W. T. Lees (Darlaston), while the stained-glass windows have been supplied by Mr. B. Jones (Walsall). The length of the building is 57 ft., and the width 30 ft., with a seating capacity of nearly 400. Access is gained by a vestibule which extends the whole length of the building, and included are a vestry, orchestra, and classrooms.

WESLEYAN CHURCH, COTGRAVE, NOTTINGHAM.—A new Wesleyan church was opened at Cotgrave on the 10th inst. The building is capable of accommodating upwards of 200 persons, and the architect was Mr. A. E. Lambert, and the builder Mr. T. Barlow.

ST. MICHAEL'S CHURCH, BRISTOL.—Mr. W. V. Gough is appointed superintending architect for the reparation of the tower of the church, which, rising in four stages from the ground, has an embattled parapet with pinnacles, and carries an octagonal turret, and a spirelet capped with a vane. The church presents a combination of the Perpendicular and Classic styles, for the chancel, aisles, and nave were rebuilt in 1775-7, after the mode in vogue at the time. About 1,200*l.* will be expended upon the new work.

PROPOSED CONVOCATION BUILDINGS, YORK.—A request will shortly be made to the twenty-four Archdeacons in the Northern Province to form committees of the members of the Lower House of Convocation and of the House of Laymen resident in their Archdeaconries, to raise the needful funds for adapting the ancient St. William's College, York, into a permanent House for Convocation. The architect of the proposed work is Mr. Temple Moore, of London.

INFANT SCHOOLS, HOWE BRIDGE, MANCHESTER.—These new schools were opened on the 1st inst. They have been built to the south-east of the old block, and provide accommodation for about 300 children. The new building is of one story, and consists of a large schoolroom, 54 ft. by 24 ft., a babies' room, 24 ft. by 21 ft., and two classrooms, 19 ft. by 24 ft. and 22 ft. by 24 ft. respectively. The smaller of these classrooms is so arranged that it may be used for babies should the babies' room be at any time overcrowded. A central corridor, 62 ft. long by 9 ft. 6 in. wide, gives access to all these rooms, and also serves for the children's marching and drilling. The architect for the new buildings is Mr. Isaac Taylor, of Manchester, under whose supervision the contract has been carried out by Mr. Thomas Scott, of Manchester.

SUNDAY SCHOOLS, ROTHERHAM.—On the 3rd inst. memorial-stones of the new Sunday Schools of the Eastwood Wesleyan Chapel, Rotherham, were laid. The site is in Fitzwilliam-road. The new buildings, which have been designed by Mr. John Wills, architect, of London and Derby, will when completed adjoin the present chapel, to which they are connected by a covered way. The scheme includes an assembly hall, 65 ft. by 50 ft., with infants' room, 22 ft. by 18 ft., church parlour, 26 ft. by 18 ft., classrooms, &c., providing accommodation for 650 scholars. The front is to be of rock-faced York stone with ashlar dressings, the sides and rear being of brick. The front gable will contain a triple window and be flanked by buttresses carried up, and finished with octagonal pinnacles. The two main entrances will be right and left of the front, each having porches and lobbies. The cost of the work, exclusive of land and architect's fees, is estimated at 2,700*l.* Mr. Richard Snell, of Rotherham, is the builder.

SCHOOLS, SOUTH NORWOOD.—New schools have just been erected at South Norwood. The site has frontages to Sandown and Oakley-roads, leading off the southern or Woodside end of Portland-road, South Norwood. The present accommodation is for 1,310 children:—420 boys, 420 girls, and 470 infants. The infants' school is a one-story building, and comprises a central hall 60 ft. by 30 ft., eight classrooms, two caprooms, and three entrances, with a teachers'-room, which will be available as a committee-room. The boys' and girls' school is a two-story building, the boys on the ground floor, and the girls on the floor above. Each department comprises a central hall 70 ft. by 32 ft., with a class for children at each end of the hall, and five classrooms for 60 each, two caprooms, a teachers'-room, store and two entrances; and the upper floor is approached by two staircases, thus providing alternative exits in case of emergency. Each department has a lock-up store with sink, and hot and cold water for the use of the caretaker, and in each of the two towers a small dinner-room is provided, one for boys and one for girls who do not go home in the middle of the day. The upper floor is constructed of steel girders and concrete. The external walls are built hollow 16 in. thick, faced externally with red Leicestershire bricks and Darley Dale stone dressings; the roofs being covered with red Staffordshire tiles. Internally the walls are lined dado high with glazed bricks, and the upper part rendered in cement and coloured with a washable distemper. The woodwork is of Carolina pine stained and varnished. The caprooms are lined their full height with buff-coloured glazed bricks, and each provided with a marble lavatory trough. Incandescent gas lighting is provided throughout the halls and classrooms with a special burner introduced by Messrs. Wm. Sugg & Co., of Westminster. The whole of the buildings are warmed from one central boiler-house under the large school by low-pressure steam working at about 2 lbs. Messrs. Korting Bros., of London, are responsible for this work. The builder's contract for the whole of the work amounts to 17,800*l.* Mr. E. J. Saunders, of Croydon, was the builder. Mr. T. W. Tester has acted as clerk of works. Mr. Carter Pegg was the architect.

BLACKPOOL BOARD SCHOOL.—A new Board school has been opened in Central-road, Blackpool. This school is the first of its kind to be erected in Blackpool. The building is of two floors, with a marching corridor 12 ft. wide in the centre of each floor, having the classrooms grouped round it and entering directly from it. The class and school rooms provide accommodation for 1,047 children, and in all except two cases the scholars will have windows on their left side. The cookery classroom is in the main building. The four cloakrooms are entered from the corridors. Large dry stores are provided in the roof. At the west end of the site a manual instruction and laundry block is placed, while between that block and the main building are the conveniences for the scholars, and the covered playsheds. The playgrounds are covered with tar-paving, and the whole surrounded with an iron railing, the playgrounds for the boys and the girls being separated by a brick wall. The main building is heated by low-pressure hot-water apparatus, and the ventilation is effected by three electric fans placed in the roof. The buildings are of brick with stone dressing round the entrance, and the main contract has been carried out by Messrs. Jacob Parkinson & Sons, of Blackpool. The heating and ventilation are by Messrs. J. G. Wagstaff, Limited, of Manchester. The structure has been erected from the designs and under the supervision of Messrs. Anderson, Simon, & Crawford, of Edinburgh, and under the inspection of Mr. Caleb Place, clerk of works to the School Board, and Mr. Frank Place, assistant clerk of works. The cost, including furnishing and street-making, will be about 18,000*l.*

BOARD SCHOOL, DEVONPORT.—The Victoria-road School, which the Devonport Board has recently built for the St. Budeaux district of the borough, was opened on the 7th inst. The school will accommodate 900 scholars. It is situated on a site adjoining Trelawney-avenue, off Victoria-road, and consists of two stories. The ground floor will be set apart for the infants, and the first floor will be a mixed school. The building has been constructed from designs prepared by Messrs. Hine & Odgers, of Plymouth. The cost of the school is close upon 11,000*l.* There are ten classrooms, with two cloakrooms on each floor. Mr. W. Blake was the builder, and Mr. G. Sleeman acted as clerk of works, with Mr. W. Efford as foreman. Baylis's system of ventilation has been used throughout the building, which is warmed by the high-pressure system of heating, fitted by Messrs. Longbottom, of Leeds. The walls outside are faced with selected local red brick, and the roof is covered with Delabole slate.

CHANCEL SCREENS, ST. OLAVE CHURCH, EXETER.—A rood screen, together with a parclose screen, have just been erected at this church. The new screens are constructed entirely of Devonshire-grown oak. The chancel screen itself is divided into five openings, the central one forming the entrance into the chancel, whilst the lower portions are so arranged that no obstruction exists that might preclude worshippers from any part of the building getting a full view of the altar. The portion over the central approach is gabled up considerably above the sides, terminating in a large cross. Upon raised pedestals at the foot of the central gable are sculptured figures of angels. The work has been carried out by Messrs. Harry Hems & Sons, of Exeter.

A NEW LONDON WORKHOUSE.—The new Greenwich Union Workhouse at Grove Park, Kent, was on the 9th inst. formally taken over by the Greenwich Board of Guardians. The new buildings are situated in open country, and may be described as a Poor Law village. The 10 acres upon which they stand cost the Guardians 4,000*l.*, and the contract for the buildings was let at 175,020*l.* There are twenty blocks united by covered ways, and they provide accommodation for 816 inmates (apart from officers and staff) of the aged and able-bodied classes. The central buildings include the front block, which consists of board-rooms and offices and quarters for the masters, matrons, and the staff. There are two dining-halls, one for 500 aged, and the other for 300 able-bodied inmates, divided for the sexes by movable partitions. The kitchen and scullery, which communicate with the halls, are fitted with steam and gas cooking appliances. A chapel has been built which will seat 400 inmates, and there is a laundry, a bakery, and a store. The pavilions for the inmates are grouped to the right and left of the central buildings, and some are placed at the back. Each pavilion contains accommodation for eighty or 100. The dormitories on the first and second floors contain two rows of beds in the place of the old system of four rows with a central partition. The rooms are of varying sizes to admit of classification. In the pavilion for married couples there are separate bedrooms and a common dayroom, with a small scullery and larder. The other buildings include workshops with hand corn-grinding mills for the able-bodied, and all the buildings are heated by hot water in addition to subsidiary open fire-grates, and are lighted by electricity. The builder was Mr. T. Rowbotham, of Birmingham, and the architects were Messrs. T. & J. Norman Dinwiddy. The whole of the institution is lighted by electricity. The engineering work has been carried out by Messrs. Moorwood, Sons & Co., Ltd., of Sheffield and London; the electric lighting by Messrs. H. F. Joel & Co., of South Molton-street, W.; the well by Messrs. T. Tilley & Sons, of Commercial-road, E.

CONVENT, BESSBROOK, CO. ARMAGH.—The foundation-stone of the new Convent of Mercy at Bessbrook was laid on the 9th inst. The site of the building is on Maghernahely Hill. The contract was awarded to Mr. Denis Neary, of Newry, and the cost will be about 6,000*l.* The architect is Mr. J. J. M'Donnell, Belfast. The building will have a frontage of 130 ft., three stories high, and is intended to accommodate eighteen sisters. A chapel and schools will be included in the building.

HOSPITAL BUILDINGS, LLANELLY.—The Llanelly Hospital Committee have decided to extend their present buildings and also erect a new operating-theatre with the most modern appliances for the surgeons' uses. Mr. Wm. Griffiths, architect, has been intrusted with the work.

KING WILLIAM'S COLLEGE, ISLE OF MAN.—The new Science Buildings in connexion with King William's College, Isle of Man, were opened by the Lieut.-Governor of the Isle of Man (Lord Henniker) recently. The new science buildings consist of chemical and physical laboratories and lecture rooms. The upper floor includes a chemical lecture room, chemical laboratory, balance room, and preparation room. On the lower floor there is a physical laboratory, a physical lecture room, a workshop, a dark room for optical work, and a dark room for photographic work. The walls are built of limestone from the Scarlett quarries, and the elevation is in harmony with the other college buildings. Messrs. Willink & Thicknesse were the architects.

NEW BUILDINGS IN ABERDEEN.—The Plans Committee of the Town Council has sanctioned the plans of the following new buildings in Aberdeen:—Six dwelling-houses on the north side of Hosefield-avenue, for Mr. A. Davidson, per Mr. Duncan Hodge, architect; three dwelling-houses on the south side of Carlton-place, for Mr. Alexander

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Anderson, builder, per Messrs. Brown & Watt, architects; alterations in connexion with premises, No. 12, Charles-street, for Mr. R. Gordon, per Messrs. Brown & Watt, architects; two dwelling-houses on the south side of Howburn-place, for Mr. John Strachan, per Messrs. Cameron & Watt, architects; two dwelling-houses on the west side of Anderson-drive, for Messrs. Bodie & Stephen, per Messrs. Cameron & Watt, architects; addition to provision works at South Esplanade, East, for Messrs. Marshall & Co., per Mr. George Coutts, architect; five dwelling-houses on the east side of Hosefield-avenue, for Mr. James Green, per Messrs. Walker & Duncan, architects; alterations and additions in connexion with premises No. 67, Crown-street, for Mr. A. Stuart, per Mr. Alexander Mavor, architect; alterations in connexion with premises Nos. 82-84, Ship-row, for Mr. D. M'Rae, per Mr. Geo. J. Milne, architect; dwelling-house and shops on the west side of Holburn-street, for Mr. James Monro, per Messrs. Brown & Watt, architects; addition to No. 4, Albyn-terrace, for Mrs. Garden, per Mr. George B. Mitchell, architect; two dwelling-houses on the north-west side of Broomhill-road, for Mr. William Walker, per Mr. James Watt, architect; dwelling-house on the east side of King-street, for Messrs. Gray & Kellas, per Messrs. Cameron & Watt, architects; two dwelling-houses on the north-west side of Grampian-road, for Mr. John Ritchie, per Messrs. Cameron & Watt, architects; alterations and additions in connexion with premises, No. 380, George-street, for Mr. Alexander Stephen, per Messrs. Brown & Watt, architects; addition to granite works on the east side of King-street, for Mr. Robert Gibb, per Mr. Duncan Hodge, architect; dwelling-house and shop on the east side of Bon Accord-street, for Messrs. R. & J. Reid, per Messrs. Brown & Watt, architects; alterations and additions in connexion with the premises, No. 600, King-street, for Mr. George Cassie, per Mr. William Smith, architect; dwelling-house on the south side of Constitution-street, for Mr. D. M. Mitchell, per Messrs. Sutherland & Pirie, architects; alterations and additions in connexion with Morningfield Hospital, King's-gate, for the managers, per Messrs. W. & J. Smith & Kelly, architects; additions to Educational Trust Buildings, King-street, for the governors, per Messrs. W. & J. Smith & Kelly, architects; six dwelling-houses on the south side of Devonshire-road, Messrs. Cameron & Watt, architects; alterations and additions in connexion with premises, No. 207, Union-street, for Mr. James P. Kay, per Messrs. D. & J. R. M'Millan, architects; dwelling-house and shops on the south side of Great Western-road at its junction with Duthie-terrace, for Mr. J. D. Mackie, per Messrs. W. Henderson & Son, architects.

INSTITUTE, HALTON, YORKSHIRE.—New premises for the members of the Halton Institute, who have hitherto been located in the Board School, are to be erected. Plans have been prepared by Messrs. Bedford & Kitson, of Leeds, for the new building, which will consist of a billiard-room, reading and dressing rooms, on the ground floor, whilst the upper rooms, which will provide seating accommodation for 250 people, will be used for public meetings and entertainments. The anticipated cost of the building and its appointments is about 2,500*l.*

BATHS AND WASH-HOUSES, FULHAM.—On the 10th inst., Mr. J. McDougall, Chairman of the London County Council, opened the new baths and public wash-houses which have been erected at Fulham. The building has been erected from the designs of Mr. H. Dighton Pearson, of Chancery-lane, at a cost of 62,593*l.*, which included 20,000*l.*, the cost of engineering, electric lighting, and pumping machinery. The main entrance is in Melnott-place. There are twenty-eight first-class and fifty-six second-class baths. The women's swimming-bath contains a pond of 60 ft. by 20 ft., and 6 ft. 6 in. to 3 ft. 6 in. in depth; thirty-one dressing-boxes, douche bath, &c. As this bath will be used on alternate days during the winter months by men, a pass door has been placed, giving access from the men's first-class corridor. The first-class private baths contain eighteen baths, &c. The first-class men's swimming-bath contains a pond 100 ft. by 30 ft., 6 ft. 6 in. to 3 ft. 6 in. deep; sixty-four folding dressing-boxes, douche-baths, and lavatory accommodation. The club-rooms attached to this bath have been arranged to give cloak-room and dressing-room accommodation at swimming entertainments. A gallery is carried round the swimming-baths, with staircases leading from the men's second-class corridors. The men's second-class private baths contain forty-one baths. The swimming-bath has a pond 125 ft. by 33 ft., 6 ft. 6 in. deep at the diving-stage end, and 3 ft. 6 in. at the shallow end; dressing-stalls for 125 bathers; douche-bath, &c. At the end of the men's second-class corridor are pass-doors leading to the establishment laundry. The public wash-house—the entrance to which is in Hartismere-road, contains stalls for sixty-six washers and a like number of drying-horses, and four hydro extractors. A large ironing-room is also provided. The basement contains subways, giving access to all piping to private and swimming baths, and also to drains. The boilers are placed under the public wash-house. Adjoining the boiler-house is the engine-room and well-house. A furnace chimney 80 ft. high is provided and built detached from the building. A water storage tank for 40,000 gallons is constructed over the washers' lockers and pay-box. The building contract was carried out by Mr. Charles Wall, of Chelsea; the engineering work by Messrs. Fraser & Fraser, of Bromley-by-Bow; the electric light wiring and fittings by the National Electric Wiring Co, of Victoria-street; the boilers and economiser by Messrs. Fraser & Son, of Millwall; and the artesian wells by Messrs. A. C. Potter & Co, of Leadenhall-street.

IMPROVEMENT OF VICTORIA STATION.—Having bought the Grosvenor Hotel and acquired all the property between the hotel and Ebury Bridge, the London and Brighton Railway Company have begun operations under their scheme framed three years ago for enlarging the terminus from 6½ acres to 14¼ acres in area, and providing room for extended platforms for eighteen instead of only eight trains as now, with four lines running out of the station. The space in front of the station will be considerably enlarged and will be closed to cab-traffic (for which other provision is to be made) and opposite the space will be erected new booking and other offices, with an extension of the hotel in the upper floors. It is intended to carry the new platforms beneath Eccleston Bridge which will be raised, and a corresponding alteration will be made of the level of Buckingham Palace-road as it approaches the bridge; between the platform-gates and the booking-offices is to be an open area extending across the entire width, 240 ft., of the station, and being 100 ft. in length. The total cost of the works, including a further widening, for two lines of rails, of Grosvenor Bridge, across the river will, it is estimated, amount to 1,080,000*l.* Extensive structural alterations of the hotel have been carried out by Mr. Alfred Waterhouse, and Mr. Morgan, engineer to the railway company. It was built in 1860-1 by Kelk, after the plans and designs of J. T. Knowles.

SANITARY AND ENGINEERING NEWS.

THE HIGHLAND PARK BRIDGE, PITTSBURG.—The new bridge across the Alleghany, completed in January last, connects Highland Park, Pittsburg, with Sharpsburg, and it has a total length of 1,850 ft., carrying a highway, two electric car tracks, and two footways. The structure includes an embankment and plate-girder approach viaduct, short lattice-girder spans, a 240 ft. truss span over a side channel of the river, three 30-ft. lattice-girder spans and connecting spans of 90 ft. and 110 ft. over Six Mile Island, and a cantilever span 850 ft. long between the anchorages, crossing the main channel of the river and the lines of the Alleghany Valley Railway, the clear span of the cantilever construction between the river piers being 450 ft. Six river piers, two abutments, and six pairs of cylinder piers on the island, form the substructure of the new bridge, which contains about 1,250 tons of steel. There are about 700 tons in the cantilever span, which was erected on each side of the river by means of a traveller, and then the centre connecting span, previously assembled complete on a large lighter, was towed under the bridge, and hoisted bodily to its position 80 ft. above water level. The lifting and connexion of the span occupied only about three hours, and the unusual method of erection adopted rendered unnecessary any provision for temporary erection stresses and any costly adjustment tackle for the expansion joints at the ends.

LINLITHGOW WATER SUPPLY.—The drought and lack of rainfall is having a serious effect on the Linlithgow water supply. The matter was discussed at the last meeting of the Local Authority, when it was resolved to take steps by way of providing for any contingency that might arise. Some time ago the services of Messrs. Leslie & Reid, C.E., Edinburgh, were called in to advise the Council as to the best means of supplementing the present supply, and they are expected to report upon the matter shortly.

SEWERAGE SCHEME, FORMBY.—A Local Government Board inquiry was opened on the 8th inst. at the "Grapes Hotel," Formby, by Mr. H. H. Law, M.Inst.C.E., and Mr. H. T. Bulstrode, M.D., concerning the application of the Rural District Council of West Lancashire for sanction to borrow 41,000*l.* for the purpose of sewerage and sewage disposal for the township of Formby. Mr. C. A. Atkinson, engineer, explained the scheme, of which he is the author. Evidence was also given by Mr. A. J. Martin, Dr. Klien, Professor Dibden, and others.

SEWAGE SCHEME, MANCHESTER.—On the 10th inst. a Local Government Board inquiry was held at the Manchester Town Hall by Mr. H. H. Law and Dr. Theodore Thomson into an application by the Corporation for sanction to borrow the sum of 360,894*l.* for purposes of sewage disposal, including the purchase of land and the construction of works in the townships of Carrington, Davyhulme, and Flixton. In the course of the inquiry, Mr. J. P. Wilkinson, C.E., who had prepared the scheme for the construction of the works, gave a description of the works.

ILFRACOMBE DRAINAGE SCHEME.—Mr. E. A. Sandford Fawcett, M.Inst.C.E., Inspector of the Local Government Board, held an inquiry at Ilfracombe on the 10th inst. into the application of the Urban District Council for sanction to borrow 31,200*l.* for works of sewerage and 1,950*l.* for street improvements. Those present included Dr. Slade King (medical officer), G. R. Strachan (consulting engineer), O. M. Prouse (surveyor), and others.

STAINED GLASS AND DECORATION.

WINDOW, ST. MARY'S, BATHWICK.—On the 6th inst. that portion of the westernmost window on the south side of St. Mary's, Bathwick, which has been filled with stained glass in remembrance of Mr. William Parham, was dedicated. The work was executed by Messrs. Clayton & Bell, of London.

MEMORIAL WINDOW, HOLY SAVIOUR'S CHURCH, TYNEMOUTH.—On the 13th inst in Holy Saviour's Church, Tynemouth, a new stained-glass window was unveiled to the memory of Mary Elise Sopwith. The window is situate in the south transept, and is comprised of three large openings and tracery above. The design represents Faith, Hope, and Charity, after the figures by Sir Joshua Reynolds. The tracery above is filled with cherubs bearing a scroll which extends across the whole window. The work has been carried out by Messrs. Wailes & Strang, Newcastle-on-Tyne.

FOREIGN.

FRANCE.—The opening of the new Museum of Decorative Art will take place next month, in the Pavillon Marsan, where the collections have been arranged under the care of M. Redon.——The archæological objects found at Susa by M. de Morgan are in course of arrangement in the portion of the Grand Palais des Arts situated at the angle of the Cours la Reine.——The Municipal Council of St. Etienne has arranged to expend a sum of 8,640,000 fr. on street improvements and the rebuilding of the Hôtel de Ville.——M. Pourquery de Boisserin, deputy and mayor of Avignon, whose vandalism has made his name celebrated, continues his course of depredations, and is at present demolishing a fresh portion of the ramparts of Avignon, between the Port St. Michél and the Porte Limbert. Neither the Government nor the Commission de Monuments Historiques seem to have thought it worth while to intervene.——A civil Engineer, M. Casalonga, has submitted a scheme for a subterranean moving pavement between the Place de la Concorde and the Place de la Bastille, with a return. The cost is estimated at 25,000,000 fr.——The Institut de France has awarded the Prix Duc to M. Guilbert, the architect, for his monumental church in commemoration of the bazaar fire.——At the Luxembourg the room annually devoted to foreign art is this year occupied by England and America. Among the works collected are Mr. Watts's "Love and Death," Mr. Whistler's "Portrait of My Mother," Mr. Sargent's "Carmencita," &c.——The Ecole Speciale d'Architecture, situated at present on the Boulevard Mont Parnasse, is to be rebuilt on the Boulevard Raspail.——The Conseil-Général of the Seine is about to open a competition in painting for the decoration of the new Mairie at Vanves.——The Municipality of Nimes is about to open a competition for the rebuilding of the Museum of Painting and Sculpture in that town.——The death is announced of M. Théodore Charpentier, architect, at the age of 73. He was a member of the Société Centrale and Vice-President of the "Caisse de Defense Mutuelle des Architects"——The death is also announced of M. F. Kaemmerer, the painter, at the age of sixty-three. He was of Dutch nationality, but had lived for many years at Paris. He obtained many medals and the cross of the Legion of Honour. He was a very able artist, excelling chiefly in *genre* subjects. Among his principal works may be named "Un Baptême," "Un Charlatan," "Manon," &c.

SWITZERLAND.—The new palace of the Swiss Parliament at Berne was opened on April 1 by the members of the Swiss Federal Council and the Federal Assembly. The building of the palace was sanctioned in 1892, and was begun in 1894. The edifice is surmounted by a lofty cupola and is situated between the two Government palaces, in conformity with the recommendation of the Legislature, but Swiss artists and Swiss material were employed on the building. It was designed by Professor Auer, of St. Gall, under whose personal supervision the work has been carried out. The cost is estimated at 8 million francs.

AUSTRALASIA.—A new bridge is about to be built over the Murray river to connect Barham on the New South Wales border, with Koondrook on the Victorian side. It will have a steel lift span, and two composite truss spans, each of 104 ft.; also timber approach spans. The work is to be carried out under Government authority.——Large additions are being made to the convent of St. Joseph, North Sydney, and the foundation-stone was recently laid by Cardinal Moran. The additions will be in the domestic Gothic style of the fourteenth century with gables at each end, and ventilating turret in the centre. Mr. D. V. Healy, of Sydney, is the architect——The Hobson-street wharf, Auckland, New Zealand, is about to be extended at a cost of over 12,000*l.*——Officers' quarters, &c., are to be erected at Southport,

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Queensland, in connexion with the Pacific cable station.

INDIA.—Surveys are being made in the Prome district, Burmah, with a view to starting irrigation works and bringing large tracts of once cultivated lands into use which now lie waste in years of small rainfall.——The Government of India has asked local authorities to give a list of what buildings and monuments are in their opinion worthy of being protected, or of being marked by memorial tablets. ——A statue of the late Queen-Empress has been unveiled on the maidan at Calcutta, in the presence of the Viceroy. The statue, which is by Mr. Frampton, is in bronze, and represents her late Majesty seated in a State chair and with insignia of sovereignty. The pedestal on which the statue rests is of green Irish marble.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT. —Mr. George Simpson, architect, has removed his offices from 15, Buckingham Gate-mansions, to 2, Princes-street, Hanover-square, W.

THE NEW FOREST.—The Government have just issued their Bill for enabling the Commissioners of Woods to sell or let land in the New Forest for necessary public purposes. The Bill provides that the Commissioners may sell or let for any term land in the Forest to meet any local sanitary requirement, and that so long as the sale or lease has effect the land in question shall be free from all rights of common, &c. (the use of any public highway thereon excepted), may be enclosed, and shall be exempt from any obligation under any Act to appropriate land to growing timber or trees. The rights of the commoners that may be prejudicially affected are to be compensated for by payments to the verderers, who will apply the moneys for purposes of the New Forest Act of 1877. Each sale or letting must in the first instance be made the subject of a representation addressed to the Local Government Board, and with the Commissioners' concurrence, setting forth that the land is immediately required in the interest of the public health of the locality, that no suitable land outside the Forest is available without undue expense, and that the situation, extent, &c., of the land will satisfy the requirements of the case, which will be tested by a local enquiry conducted by the Local Government Board.

BOND FOR CONCRETE JOINTS.—A new method of bonding successive layers of concrete has lately been patented by an American firm, and is specially suitable for use in connexion with concrete buildings. The present method of constructing a floor with steel-concrete beams and filling involves the trouble and expense of building up falsework for supporting the work until it has set sufficiently to be safe. Under the new system the beams can be made in moulds in the contractor's yard instead of being formed on the site. In the upper surface of each beam a spiral coil of twisted steel is partly embedded so as to provide an efficient bond for the flooring concrete. When the beams for a given floor have been made and are thoroughly set, they can be delivered and erected in position without any difficulty. Bolt holes are left through the upper portions of the beams for the attachment of cleats, upon which centring boards may be laid for supporting the floor slab, and so the whole floor can be carried during construction by the beams and columns. The system of bonding to which we refer should be reasonably inexpensive, and it will certainly facilitate the erection of steel-concrete buildings.

THE OLD LEYSIAN MISSION.—An extension scheme, recently ratified, comprises the establishment of an Old Leysian Settlement and Hostel on a site in the City-road. There will be a settlement for students and young men engaged in business; a settlement for lady-workers and the sisterhood; men's and women's clubrooms, with gymnasium and drillhall; a great hall with a capacity of 2,000, and a lesser hall with a capacity of 600; a suite of twenty-five classrooms; a medical mission department, &c. One-fifth of the total cost, which it is calculated will amount to 100,000*l.*, will be granted from out of the Wesleyan Connexional Fund. Some recoupment is looked for from the rentals of the shops and offices that will be let for general purposes.

HOUSING AT DURHAM.—On the 5th inst. a public meeting to consider the housing needs of the city was held at the Mayor's Chamber, Durham. Mr. Aldridge, of the National Housing Reform Council, under whose auspices the meeting was held, said the Council took up the question in no hostile spirit to the municipalities, and were principally desirous of awakening an interest in the matter. Quoting from the recent census return, the speaker said there were 439 one-roomed houses in Durham. In 133 cases one person lived in one room, in 131 cases two persons in one room, 73 cases with three, 54 with four, 22 with five, 14 with six, 5 with seven, 4 with eight, and one with eleven in one room. There were also in the city 980 two-roomed houses, occupied in 75 cases by one person, in 168 by two, in 182 by three, in 160 by four, in 120 by five, in 102 by six, in 76 by seven, in 43 by eight, in 31 by nine, in 13 by ten, in 2 by eleven, and in 2 by twelve or more persons. There were 430 three-roomed and 377 four-roomed houses. The co-operative society had done something in the matter; but the time had arrived when the Municipality should take up the matter, and he urged on the citizens of Durham to do something.—The Mayor expressed sympathy with the object of the Council. It depended very largely on the people themselves. If they were to put some people into better dwellings they would be in the same position a month later, and they would have the same thing to go over again. Great attention had been paid to the matter by their Medical Officer and Surveyor in Durham, and he could hardly believe there was one case in that city where seven or eight people were living in one room. He felt inclined to contradict it; but if it were true, the sooner it was remedied the better. Speaking for the Durham Corporation, he did not see how they could do anything in the matter just now; they had enough on hand in other ways. Besides, where could they get land to build on at a reasonable price?—After discussion it was agreed, on the motion of Mr. John Wilson, M.P., seconded by the Rev. H. Robertson, and supported by Mr. J. Johnson, "That this conference, having had under consideration the overcrowding in the city of Durham (which we very much regret), is of opinion that a large portion of it arises from the number of miners (for whom houses should be found by the employers at the surrounding collieries) being compelled to reside in the city owing to the lack of houses near the mines where they work, and we call upon such employers to provide a sufficient number of houses for their workmen contiguous to the mines, which would relieve in part congestion and overcrowding in the city." A further resolution inviting those concerned to consider what further steps should be taken was carried.

CO-OPERATIVE BUILDING.—A midland sectional conference, promoted by the Productive Committee of the Co-operative Union, was held at the Worcester Co-operative Hall on the 5th inst., Mr. J. Giles (President) presiding, when a paper by Mr. W. H. Brown, entitled, "The Next Step in Co-operative Production," was submitted for discussion. The paper, pointing out that co-operative societies had already spent over seven millions in housing, suggested that co-operators should seriously tackle the building trades. Some such efforts had proved expensive, others had produced profits. Operations should be begun in a small way in connexion with a mortgage department. Co-operative societies would thus help to house the people, while retaining the profits in their own hands, and would extend their influence in many ways, so that co-operative saw mills would be necessary; they would go direct to the importer of timber; and would need their own stone works and co-operative quarries. The jerry builder would have a competitor, and the standard of building would be raised.—Mr. Taylor (Leicester) agreed with the principle, but said he represented a society which had a works department, and could not congratulate them on their success. After forty years' experience in the building trade he had no hesitation in saying they were altogether out of the market. He knew a co-operative society which went into competition with private builders, and had in consequence to write off its capital 40 per cent.—Mr. Mann (Leicester) described the methods of the society referred to by Mr. Taylor as "slip-shod."—Mr. Langley (Productive Committee) said the step advocated had been taken for some years. Experience at Kettering had shown that with determination the trade would flourish.—Mr. Brough (Birmingham Industrial) thought it a mistake for an ordinary society to dabble in too many departments. It was impossible for a committee of twelve or thirteen men to look after a business extending in such widely different directions as bacon and buildings.—Mr. Codling (Lincoln) said the step had been taken long ago. His society did work last year amounting to 16,235*l.*, a portion of which was in competition with outside builders for public work. If properly managed it was a very profitable department.—Mr. Halstead (Co-operative Federation), moving a vote of thanks to Mr. Brown, thought it would be possible in the future to federate the purchase of certain common stocks of timber.—Mr. Woodhouse (Derby), seconding, said Mr. Brown had only anticipated what many large societies would be driven into. In Derby, where they had made a good start, they could not get workmen to rise to the co-operative idea. His society had advanced 183,000*l.* to members for houses, many of which were built by the society. Mr. Brown, in reply, said that of the seven millions spent by co-operative societies in housing, he would guarantee that over six millions had gone into the pockets of private firms. He had just been around Droitwich, where he thought there was an opening for the Co-operative Society to put up decent houses. He was glad to hear that in the Midlands the bricklayers put forth their best. He would like to take some back with him to his society's Woolwich estate, where they had difficulties, even though their men were paid the trade union rates.

AN ARCHÆOLOGICAL FIND.—An archæological discovery has been made in the old ruins of Llantrithyd Place, in the Vale of Glamorgan. In consequence of the erection of certain temporary buildings inside the ruins of Llantrithyd, it became necessary to remove a portion of a mound of earth, under which a carved stone was found. The soil was carefully removed on all sides, and a round block of stone, which would appear at one time to have been the base of a pillar or cross, was revealed. It is about 2 ft. in height and 3 ft. in diameter. Its upper side has a square hole in it, such as is to be seen in the shaftless bases of many of the Glamorganshire churchyard crosses. But the interesting feature about it is that all round its sides it is finely carved. It is evident that the work is of Norman date. The carving represents arching, the arches of which are Norman in style. Each arch is separated by a slender pillar, of which the bases appear to be plain, while the capital of every alternate pillar is fluted. The style is different from anything to be found in any church in the Vale of Glamorgan, and the vicar of Llantrithyd inclines, says the *Westminster Gazette*, to the belief that it once formed the base for a pillar, or statue, in one of the rooms at Llantrithyd Place.

GOVERNMENT OFFICES, DUBLIN.—It is stated that the Government have prepared a measure for enabling them to acquire upon compulsory terms of purchase a block of large houses in Upper Merrion-street, Dublin. The houses, eight in number, stand between Merrion-place and Leinster-lawn; five of them are already occupied by the Agricultural Department and the Stationery Office, and it is understood that the three others will be taken for purposes of certain departments which are at present housed, at considerable expense, in various outlying situations. If the scheme is accomplished it is probable that the gardens and stabling of the houses in Upper Merrion-street that lie towards Kildare-street will be levelled, and the ground utilised to afford a frontage to the latter street for the new College of Science.

CLAREMONT CHAPEL, PENTONVILLE-ROAD.—This building, which has remained vacant during some months past, has been taken by the London Congregational Union to serve for a mission centre in what is, we believe, one of the most densely-populated districts of London. One half—4,000*l.*—of the cost of the scheme is contributed by Mr. W. K. Brown, of Woodford, who intends to alter the interior of the fabric for its new uses, to make four classrooms on the ground floor, to provide a kitchen, lavatories, and so on, as well as reading-rooms and a large lecture-hall, and so to convert and extend the premises as a local "settlement."

HEATON PARK, MANCHESTER.—It is announced that the Corporation of Manchester have bought for 230,000*l.* the Heaton Park estate from the Earl of Wilton. The park, which extends over about 650 acres and is surrounded with a brick wall, is distant four miles from the Royal Exchange, whence it can be readily gained by road or conveyance. The estate will be converted for purposes of public resort and recreation, and it is proposed to adapt the mansion-house, which stands in the park, as a picture gallery or museum. The house was built, 1772-3, after plans and designs by James Wyatt, for the first Earl of Wilton. From a temple in the park is obtained an extensive view over the adjoining counties.

THE PARISH CHURCH, BEAUMARIS.—We hear that Mr. Bodley has prepared the plans for the restoration, at an estimated expenditure of 5,000*l.*, of the parish church, formerly known as the Chauntrey of Our Lady of Beaumaris. The church has a large square embattled tower at the west, a chancel, and a nave with north and south aisles—called St. Mary's Chapel and St. Nicholas's Chapel respectively. The fabric was repaired by Viscount Bulkeley, to whose memory a marble monument, by Westmacott, was erected in the chancel, where is also a fine alabaster altar-tomb with their effigies of, as is supposed, Sir Richard Bulkeley and his wife, *temp.* Elizabeth, removed thither at the dissolution of the neighbouring monastery at Llanvaes. After Lord Bulkeley's death in 1822, his Baron Hill estate, on which stand the ruins of Beaumaris Castle, passed to Sir Richard Williams-Bulkeley, Bart.

SELBY ABBEY TOWER.—A meeting of the committee appointed to deal with the repair of the Selby Abbey tower was held on the 8th inst. A Report was received from Mr. J. Oldrid Scott, of London, who stated that since his last report on the tower the various defects to which he drew attention have increased, in spite of certain work which has been done in the interval to strengthen the north wall. The upper stage, he says, is in bad condition, the cornice being almost ruinous, while the walls are badly built and in a very disjointed state. The chief mischief, however, shows itself in the north-west pier, which during the last few years has developed a considerable number of cracks passing through its facing stones. These surface failures show clearly that the pier is carrying a greater weight than it is equal to. It is this pier which has always been the one which has been most affected by the soft subsoil on which the tower is built, though it is quite possible that the one to the south-east was still more seriously affected before it gave way in the seventeenth century. Certainly, of the four piers it is now seen that the one to the north-west has sunk the most, and it also carries a greater weight than any of the others, owing to the south and east walls of the tower having been reduced in thickness when they were rebuilt. It has therefore become absolutely necessary to take some steps to arrest the mischief which is in progress, and which if allowed to proceed will undoubtedly increase and create a very serious danger. It is a great satisfaction to

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Mr. Scott that the committee appointed to ensure the stability of the tower have resolved to take the course decided on, and reduce the weight of the tower by removing the upper story. It appears that this will relieve the piers of about one-fifth of the burden they have to carry, and it can afterwards be considered what further steps shall be adopted for remedying the defects in the north-west pier which he described. His own strong hope is that within a reasonable time it may be decided to deal with the defective foundations of the pier as well as to remedy the weakness which has shown itself above the ground level. Whether, when doing this, the terrible distortion of the arches abutting on the pier from the west should be made good, as those to the east of the tower have already been, will be a subject for further consideration.

CURIOUS DISCOVERY AT CAPRI.—The romantically situated ruins of a Roman Imperial villa—the villa of the Emperor Tiberius on the southern headland of Capri—have recently been undergoing archæological examination, and amongst the subterranean chambers unearthed the traces of an ancient prison have come to light, which, to judge by inscriptions, was at one time tenanted by the wife and sister of the Emperor Commodus nearly two hundred years after the time of Tiberius.

THE HOUSING QUESTION.—On the 26th inst. a North of England Housing Reform Conference will be held in the Meeting Hall of the Co-operative Wholesale Society, West Blandford-street, Newcastle-on-Tyne. The following resolutions are to be submitted:—(1). That this Conference desires to call the attention of Local Authorities throughout the North of England to the evil effects on the life and happiness of the people resulting from overcrowding and bad housing conditions; and in view of the fact that many Local Authorities in the Kingdom have successfully administered "The Housing of the Working Classes Act, 1890 and 1900," urges them to—(*a*). Make special local enquiries in regard to the housing conditions prevailing within the areas under their control, both in respect to the needs of the "poorest poor" and also of the skilled artisan; and (*b*), On ascertaining the need for the use of remedial measures, to place into active operation the valuable powers which have been provided for that purpose. 2. That this Conference desires to call the attention of Local Authorities throughout the North of England to the need for—(*a*). Making such alterations in their by-laws as shall render impossible the building of long unbroken rows of houses, with doors opening direct upon the common pavement, and with cramped backyards. (*b*). The encouragement in every possible way of the design and erection of artistic "self-contained" cottages, with wide roads, large gardens and a plentiful provision of open spaces for the healthful recreation of the community. (*c*). The setting of a standard in this respect by the development of municipal garden cities. (*d*) Obtaining further legislation to enable Local Authorities to acquire land under compulsion at a price based on the assessment of such land to taxation. This land to be then used municipally or leased under the Act of 1900 to co-operators and other societies for the purpose of building houses for the people. III.—That this Conference desires to express its satisfaction at the rapid increase in the means of cheap and easy electric transit, especially in Newcastle and Sunderland, where direct public control has been secured. This Conference, moreover, urges Local Authorities in every district in which the supply of workmen's trains is inadequate, to bring the matter under the official notice of the Board of Trade, and to ask that Authority to take the necessary steps to secure the provision by the railway company of an adequate supply of workmen's trains in accordance with the Cheap Trains Act, 1883, under which they obtained a remission of passenger duty, on condition that provision should be made by them for workmen's trains.

AN AUSTRALIAN NATURAL MARVEL.—The railway connecting Sydney with Brisbane, as it emerges from the Hunter River Valley and proceeds towards the Queensland border, traverses a country full of picturesque interest, while the region between Scone and Wingen possesses many features of interest to geologists and scientific men. As Wingen, ten miles beyond Scone, is approached, a singular natural curiosity becomes observable. This is an object popularly known as "The Stone Woman of Wingen." The spur of a mountain range, known as Salisbury Crag, terminates in a bold, bluff headland, about 700 ft. above the level of the valley which it commands, the profile assuming the form of a grey stone woman of enormous dimensons sitting with her back against the cliff, her head just separated from the top, and her feet hidden among the trees which grow up to the bottom of the cliff. On her knee there is resting an open book, which she is not reading, but instead is gazing for ever down the beautiful valley of the Hunter, over Scone, Aberdeen, Muswellbrook, Singleton, and Maitland, which, with good glasses on a clear day, may all be seen by any one standing on the top of the cliff, or on the stone woman's head, which is its most southerly extension. From where the feet of the stone woman rest among the towering trees that grow round the base of Salisbury Crag to the summit of her head must be about 500 ft., so that if she were to stand up straight some day she would be about 800 ft. high. If the proper point of view be chosen, the pose of the figure is perfect in its magnificent simplicity. Those who have seen it, describe it as one of the grandest natural marvels yet known.

COMMONS AND FOOTPATHS PRESERVATION SOCIETY.—A meeting of the General Committee of the Commons and Footpaths Preservation Society was held at 25, Victoria-street, Westminster, on the 11th inst., the Right Hon. G. J. Shaw Lefevre in the chair. The Chairman reported that he had now received a communication from the Charity Commissioners in reply to the protest which he had formulated on behalf of the Society against the proposed alienation of Fuel and other allotments, notwithstanding the clause in the Commons Act, 1876, which provides that no such allotments shall be diverted from their original purpose except for recreation grounds and field gardens. The Commissioners now stated that "they have come to the conclusion that the restrictive provisions of Section 19 of the Commons Act, 1876, was not affected by Section 18 of the Commons Act, 1899, and that accordingly the Commissioners are not at liberty to sanction the sale, or letting on building lease, of any part of an allotment falling within the section first above-mentioned." Much satisfaction was expressed at the favourable result of the Society's representations, as the decision of the Commissioners will ensure the preservation as open spaces of many thousands of acres of allotments set out under old Inclosure Acts.—The Solicitor reported that the Birmingham Corporation had now agreed to the insertion in their Water Bill of clauses drafted by the Society with the object of securing to the public a privilege of enjoying air, exercise, and recreation on such parts of the common land which they propose to acquire in Radnor, as are not required for actual works. The area of common land over which the public will obtain the privilege will exceed 1,600 acres.—It was stated on the consideration of the Richmond Hill (Preservation of View) Bill that it was now proposed to vest in the Ham Urban District Council, and not the Surrey County Council, the major portion of the riverside land to be given by Lord Dysart as part compensation for a right to enclose the open common fields. The following resolution was unanimously adopted: "That this Committee is of opinion that a settlement of Lord Dysart's interests in his lands at Ham and Richmond which vests the riverside lands to be dedicated to the public (the principal concession for the advantages his lordship is to obtain) in a small local authority like the Ham Urban District Council, which has no adequate rating power, will not be satisfactory, and the Committee trusts the lands will be vested in the Surrey County Council, which is willing to take charge of them."—It was also resolved to take such steps as might be necessary to ensure that no amendments prejudicial to the interests of the general public are made to the New Forest (Sale of Lands for Public Purposes) Bill. Other matters considered were the action the Society is taking with reference to the obstruction of the alleged rights of way leading to Stonehenge; the preservation of Lambourne Common, Essex; the enclosed land in the centre of Wandsworth Common; and the provision of parks and open spaces as a suitable means of permanently commemorating the Coronation.

FONT, ST. MICHAEL'S, CAMDEN TOWN.—A font has been placed in St. Michael's Church, Camden Town, executed from the designs of Mr. G. F. Bodley, who was architect of the church. It is in a dark green marble, the whole being placed upon two octagon steps of the same material. The work was carried out by Messrs. Flint Bros., of Clapham.

THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS. — The thirty-sixth examination of candidates for Surveyorships under Municipal Corporations and District Councils, carried out under the auspices of this Association, was held at the Medical Examination Hall, Victoria Embankment, London, on Friday and Saturday, April 11 and 12. Thirty-two candidates presented themselves for examination. The examiners were:—In (1) Engineering: Mr. J. P. Barber, M.Inst.C.E., assisted by Mr. A. M. Fowler, M.Inst.C.E. (2.) Building Construction: Mr. W. Geo. Laws, M.Inst.C.E., assisted by Mr. W. N. Blair, M.Inst.C.E. (3.) Sanitary Science: Mr. J. Price, M.Inst.C.E., assisted by Mr. J. Lemon, M.Inst.C.E. (4) Municipal Law: Mr. C. Jones, M.Inst.C.E., assisted by Mr. J. T. Eayrs, M.Inst.C.E., and Mr. J. Lobley, M.Inst.C.E. Mr. Laws was the Superintending Examiner.

THE VALUE OF RIVERSIDE PREMISES. — Mr. Under-Sheriff Burchell and a special jury, at Red Lion-square, Holborn, on Friday last week, began the hearing of the case of "Wall *v.* the District Railway Co.," a claim for compensation in respect of wharf property in Chelsea Creek, and the Ashburnham Works adjacent thereto, and having a frontage to Lot's-road, Chelsea, required for the purposes of the new electrical generating station for the District Railway. Sir Edward Clarke, K.C., and Mr. Spokes appeared for the claimant; Mr. Cripps, K.C., and Mr. Courthope-Munroe represented the railway company. Sir Edward Clarke, in opening the case, said that the area to be taken was made up of 12,965 square feet used as a wharf, and 8,850 square feet, part of the Ashburnham Works, where the claimant had for many years carried on business as a builder. Owing to the absorption of the northern side of the Thames for public improvemements in recent years, there was now hardly any wharf property on the north side of the river between Blackfriars Bridge and Chelsea Bridge. Consequently, the claimant would have to remove to the south side of the river to a site which would cost about 14,000*l.*, and new buildings and machinery would represent another 17,500*l.*; and for disturbance of the business a further 33,500*l.* should be added. Evidence in support of the claim was given by Mr. E. H. Bousfield (Edwin Fox & Bousfield), Mr. James Green (Weatherall & Green), and Mr. F. J. Terry (Fuller, Horsey, & Co.). On behalf of the railway company Mr. Cripps submitted that about 23,000*l.* would be proper compensation. On Saturday expert evidence in support of this contention was given by Mr. Alexander R. Stenning, Mr. Samuel Walker, and Mr. Douglas Young (vice-president of the Auctioneers' Institute). The jury, having viewed the property, after a short deliberation, awarded the claimant the sum of 35,000*l.*

THE CHURCH CRAFTS LEAGUE.—The Committee of the Church Crafts League have arranged for an exhibition of the work of its artist members, to be open daily, at the Church House, Westminster, S.W., from April 30 to May 30, between the hours of 10 a.m. and 6 p.m. Admission is free, and no tickets will be required, and it is hoped that many of those who attend the "May Meetings" at the Church House will avail themselves of the opportunity of seeing the exhibits. The collection of Mediæval Church ornaments, which Mr. W. H. St. John Hope obtained for the English Church Exhibition at Brighton, during the Church Congress in October last, will also be included in the exhibition. The "private view" will be on Tuesday, April 29, and the Bishop of Rochester will formally open the exhibition on that day at 4.30 p.m. Cards of admission (for April 29) can be obtained from the secretary, Mr. Francis Burgess, Church House, Westminster, S.W.

PUBLIC IMPROVEMENTS, SHEFFIELD.—Mr. W. A. Ducat, an Inspector of the Local Government Board, held an inquiry at the Town Hall on the 11th inst., into an application by the Sheffield Corporation for sanction to borrow 10,148*l.* for the purchase of land at Bole Hills for a recreation ground and the site of a refuse destructor; 50,000*l.* for the conversion of middens into water-closets; and 4,800*l.* for street improvements. Evidence on the matters raised was given by the City Surveyor (Mr. C. F. Wike). At the close of the inquiry the inspector visited the Bole Hills.

RESTORATION OF MALMESBURY ABBEY.—The Bishop of Bristol presided at a meeting of the Restoration Committee in the Town Hall, Chippenham, on the 11th inst., when it was unanimously resolved that section two of the work, comprising the west end and two bays of the south aisle, be completed. This resolution was adopted in the hope that a public meeting to be held in Bristol would result in a material increase of the restoration fund.

CAPITAL AND LABOUR.

GLASGOW JOINERS.—A meeting of the Glasgow Master Wrights' Association was held on the 9th inst. in the Building Trades' Exchange for the purpose of considering the request of the working joiners that the conditions of employment which have, at the instance of the men's union, ruled in the trade for some years back, be signed by the masters individually for another year, and also for considering the advisability of insisting on a reduction of wages. Mr. John Smeaton, Govan, President, was in the chair. At the close of the meeting it was officially intimated that the masters were communicating with the men's officials, and that in the meantime they could not say what the tenor of their communication was. They added, however, that the majority of the meeting were decidedly against signing the conditions as desired by the men.

EDINBURGH JOINERS AND THEIR WAGES.—An aggregate meeting of Edinburgh joiners was held on the 7th inst. in the Music Hall, George-street, Mr. C. Murray presiding. The meeting was called to consider a notice by the employers on January 10 of a reduction of 1d. per hour, which made the wages of the trade 8d. per hour. A meeting of the men was held on the 12th of last month, when they decided not to agree to any reduction in their wages. They further decided to meet the employers in conference and discuss any point they might bring up. The employers subsequently wrote to the officials of the men that they agreed to a conference. That conference was held, and its result was reported to a meeting of the men held on March 31. At that meeting the men decided to adhere to their former decision not to accept any reduction. The employers then intimated that they were prepared to agree to a ½d. reduction, failing the acceptance of which that the matter be referred to arbitration. That matter was considered by the meeting on the 9th inst., and after considerable discussion it was agreed that they do not accept a reduction, and that they issue the existing by-laws to the employers for their signature.

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LEGAL.

DISPUTE AS TO BUILDING A THEATRE AT NORWICH.

THE case of Morell and another *v.* the New London Discount Co., Ltd., came before Mr. Justice Ridley, sitting without a jury, in the King's Bench Division on the 11th inst. It was an action by the plaintiffs, Messrs. H. Harvey Morell and Frederick Mouillot, theatrical managers. to recover from the defendants damages for breach of an agreement entered into between the plaintiffs and the defendant company, and in the alternative for the repayment of the sum of 300*l.* paid by the plaintiffs to the defendants. The defence was that there had been no breach of the agreement, and defendants counterclaimed for the sum of 102*l.*, which they said was due to them by the plaintiffs under the agreement.

It appeared that at the end of the year 1898 the defendants arranged to build a theatre at Norwich, and for that purpose acquired a site and engaged the services of Mr. Runtz, theatre architect. The defendants in the spring of the following year got into communication with the plaintiffs, and in the result an agreement was entered into dated August 16, 1899. It contained a recital that the defendants had purchased land at Norwich and intended to build a theatre on it, and that it was agreed the plaintiffs should contribute towards the expenses of building the theatre at the rate of one-tenth part to each nine-tenths parts contributed by the defendants, the plaintiffs' liability being limited to 1,250*l.* The plaintiffs were to become managing directors of the theatre at a salary of 200*l.* a year each for a term of five years, and were to receive 10 per cent. on the surplus profits available for dividend after the ordinary shareholders had received a dividend of 5 per cent. The defendants spent some 4,022*l.* on the building operations, but in December, 1900, the company went into liquidation. Towards the sum of 4,022*l.* the plaintiffs contributed 300*l.* under the agreement by means of three bills for 100*l.* each, and also gave a bill for 102*l.*, but they refused to meet it when it became due owing to the work on the proposed theatre having come to an end on account of the company being in liquidation.

Mr. Horace Avory, K.C. (with him Mr. C. A. S. Garland) on behalf of the plaintiffs contended that there was an implied covenant that the theatre should be built within a reasonable time. The plaintiffs had performed their part of the contract in consideration of the land having been obtained and the theatre being built, and he submitted that so long as the plaintiffs were willing to contribute, the defendants were bound to go on with the work.

Mr. Eldon Bankes, K.C. (with him Mr. Atkin) argued that there was no implied covenant to build the theatre. As both the plaintiffs and the defendants were co-adventurers in a speculation to build the theatre, and financial assistance not being available the plaintiffs were not entitled to succeed.

Mr. Justice Ridley in giving judgment thought that defendants ought to succeed. He did not think that the agreement ought to be read in the way contended for by the plaintiffs. The case was one in which the defendants had not taken on themselves the obligation in any express terms, and the law would not place them under the obligation in the absence of express words. There would be judgment for the defendants on the claim, and on the counterclaim for 102*l.*, the balance of the sum of 402*l.* which remained unpaid, with costs.

AN ENGINEER'S ACTION AGAINST A DISTRICT COUNCIL.

THE case of Lawford *v.* the Billericay Rural District Council came before Mr. Justice Darling, sitting without a jury, in the King's Bench Division on the 11th inst., it being an action by the plaintiff, an engineer, to recover from defendants 169*l.* 14s. as remuneration for his services in preparing a report and plans, &c., in connexion with a sewerage scheme which was being carried out by the Council. The defence was that as the common seal of the defendants was not affixed to the agreement the agreement was not valid and binding on the defendants.

The facts were shortly these:—In July, 1899, the plaintiff was retained by an agreement under the common seal of the defendants to act as engineer to the Council in connexion with certain sewerage works which defendants proposed carrying out in the parishes of Shenfield and Hutton. The plaintiff was employed to prepare plans and specifications, &c., to attend at a local inquiry held on behalf of the Local Government Board, and to obtain tenders for, and superintend the work. In September, 1900, defendants discovered that the drainage of Shenfield Common, which was outside the scope of the original sewerage scheme, was not in a satisfactory condition, and the Council passed a resolution that plaintiff should be asked to visit Shenfield Common and make a report of the work necessary to be done there and to prepare an estimate of the probable cost. The plaintiff accordingly acted as requested. It appeared that the plaintiff was then verbally instructed by defendants to act as engineer in respect of the extension work, and to do like services to those he performed under the agreement of July, 1899. In the correspondence, defendants suggested that the agreement of July, 1899, should apply to and include services in respect of the extension work, and the plaintiff agreed that it should be so on certain terms. The plaintiff did what the defendants requested, and a member of his firm attended the inquiry which resulted in the extension scheme being sanctioned, and later on the plaintiff took out quantities for the work. Tenders were advertised for and were made for the work, but none were accepted. The defendants admitted that the plaintiff had authority from them for all the work he did, that that work was incidental to the duties of the defendants as a District Council, and that his services were in respect of work as to which some sewerage works were necessary. They relied, however, on a number of cases to show the necessity of a corporate body contracting under their common seal.

At the conclusion of the arguments Mr. Justice Darling came to the conclusion that the agreement, in order to be binding upon the defendants, should be under their common seal. He thought that the defendants were entitled to succeed on the point which they had taken and the judgment must be entered for them.

Judgment accordingly.

Mr. C. A. Russell, K.C., and Mr. Montague Lush, appeared as counsel for the plaintiff; and Mr. Macmorran, K.C., and Mr. Naldrett for the defendants.

TRADE LITIGATION IN BLACKBURN.

AT the Blackburn County Court, on the 7th inst., an action was mentioned, in which the plaintiff was Robert Leaver, plumber and glazier, carrying on business at New Chapel-street, Mill Hill, and the defendants were J. Cronshaw, Richard Fletcher, J. H. Fecitt, James Chadburn, W. H. Dent, Richard Highton, and W. J. Tinning, all of whom are master tradesmen connected with the building trade in Blackburn and district, with the exception of the defendant Tinning, who is the secretary of the Building Trades Federation. Mr. A. Read appeared for the plaintiff, and Mr. Rennison represented all the defendants excepting Tinning, for whom Mr. Broadbent appeared.

Mr. Read stated that prior to the month of October, 1900, there had been a dispute between Messrs. Higson & Sons, a firm of master builders in Blackburn, and their workpeople, which had resulted in a strike of the latter, and in connexion with such strike a dispute had been threatened by the workmen's trade union association that unless certain of their terms were complied with a general strike of all trade union workpeople employed in the building trade in Blackburn and district would take place. On Monday, October 22, 1900, the defendants, along with other persons, met at the Exchange Hall, Blackburn, the defendant Tinning being present as the secretary of the workmen's trade union association, known as the Blackburn Building Trades' Federation, and an arrangement, or agreement, by resolution was come to between the defendants and other persons then present, of which the following was substantially a correct record: After hearing a statement from the employers in respect to the contractors working in conjunction with Messrs. Higson & Sons, the federation representatives agreed to allow the present contracts to be completed, the employers, on the other hand, pledging themselves not to have any dealings with the firm until the present dispute was settled satisfactorily to the Masters' Association and the Federation, and that all members of the Building Trades Federation were prohibited from working in conjunction with Messrs. Higson & Sons, joiners, from the morning of the next day. On April 16, 1901, plaintiff entered into a contract for the plumbing work upon two houses in Francis-street, Mill Hill, which were in course of erection, and his men commenced work upon the job on May 2, 1901. At this time Messrs. Higson & Sons, under another contract, were doing the joiners' work for the same houses. The plaintiff at the time had no knowledge of the arrangement made at the last meeting, but entered into the said contract, and as the result of his working in conjunction with Messrs. Higson & Sons, and in compliance with the arrangement in question, his workmen refused to work for him, and he had since been unable to obtain competent workmen, his business had been brought practically to a standstill, and he had sustained a very heavy loss. The plaintiff alleged that the compact was an illegal combination, and that the defendants and the other persons privy to it knew, or ought to have known, that it would, and that it was their intention that it should, injure the business of the firm of Higson & Sons and the business of any other master tradesman who might be working upon any building upon which Messrs. Higson & Sons' men were working, and that the defendants were liable for the consequence of their act in making the compact with the workpeople and their representatives. The plaintiff claimed the sum of 50*l.*, or such other sum as the Court should award, by way of damages, and such other relief by way of injunction as the Court should deem just.

Mr. Read made the usual application for the discovery of documents. He said certain letters had been written having reference to the case, but they were being kept back, although the defendants knew that they affected the case.

His Honour granted the application, and gave instructions that the nature of the joint ownership under which the letters were written be shown.

Mr. Read then asked that the name of a man named Dawson should be added to the list of defendants. He was the secretary of the Master Builders' Association, and was present at the meeting referred to, and took notes on the proceedings. He (Mr. Read) gathered that the bulk of the letters had passed between this man Dawson and Tinning, and if they were both summoned they could not decline to produce the documents which had passed between them.

His Honour ordered that a notice be served on Dawson in accordance with the application.

The case was then adjourned until May 12.—*Blackburn Telegraph.*

APPORTIONMENT OF THE COST OF SEWERING.

AT Highgate, Mr. George Louis Roblin, of Rushacre, Colneyhatch-lane, Muswell-hill, was summoned by the Finsbury Borough Council for the recovery of 35*l.* 5s. 1d., the amount of an apportionment of the cost of sewering Colneyhatch-lane. Mr. C. Fleetwood Pritchard, barrister, appeared for the Council, and Mr. Alexander Glen, barrister, appeared for the defendant. The summons formed another stage in proceedings which have extended over several years. Colneyhatch-lane is an ancient thoroughfare forming the boundary between Hornsey and Clerkenwell Detached, the latter, until the passing of the Local Government (London) Act, being under the jurisdiction of the Clerkenwell Vestry, which has been superseded by the Finsbury Borough Council. In 1882 the Clerkenwell Vestry put a new sewer in Colneyhatch-lane, a portion of the thoroughfare, it was said, being widened at the same time. The vestry apportioned the cost of the sewer upon the owners of the property abutting on the lane from the top of Muswell Hill to the parish boundary near Birkbeck-road. Between twenty and thirty of the owners refused to pay, and summonses were issued against all of them, the amount in dispute being altogether about 1,000*l.* It was decided to take the summons against Messrs. Edmondson & Co. as a test case, and this was heard by the Highgate justices on May 16, 1900. It was contended on behalf of the vestry that the sewer in question was laid for the drainage of a "new street," Colneyhatch-lane having, as they alleged, become a new street by reason of the new buildings erected in the Clerkenwell Detached portion. On behalf of the defendants it was contended that the lane had not become a new street, because it had been entirely built upon on the Hornsey side before the passing of the Metropolis Management Act of 1855. The magistrates held that, in order to decide the question, they must look upon the thoroughfare as a whole, and not upon the portion in Clerkenwell only. They dismissed the summons, but consented to state a case, which was argued in the Queen's Bench Division before the Lord Chief Justice and Mr. Justice Kennedy in November, 1900. The appeal was dismissed, but, as the case raised a new point of law, leave to carry the case to the Court of Appeal was granted. In the Court of Appeal on January 6 this year the appeal of the vestry was again dismissed. The vestry, however, refused to be bound by this decision in the case against all the defendants, and now alleged that the portion of the lane between the top of Muswell Hill and Alexandra Park-road had been widened when the sewer in question was laid, and they claimed to be entitled to deal with the widened portion as "a new street." The case against the present defendant was selected as a test case. Mr. Fleetwood Pritchard, in support of his case, relied on the decisions in "White *v.* Fulham," "Richardson *v.* Keswick," and "The Property Exchange *v.* Wandsworth." Mr. J. P. Killick, surveyor of the Finsbury Borough Council, and formerly surveyor to the Clerkenwell Vestry, put in the apportionments made by the vestry. Mr. Glen, in cross-examination, asked what was the width of the lane near the defendant's house in 1878, as shown on the Ordnance map? The Witness: Forty feet. Mr. Glen: And as shown on the Ordnance map of 1896? The Witness: Forty feet. Mr. Glen submitted that, as the vestry claimed to have widened this portion in 1882, the case must fail. The Bench dismissed the summons, and allowed 15 guineas costs against the Finsbury Borough Council.—*Times.*

ALTERING A PUBLIC-HOUSE FRONTAGE.

THE Recorder of Bristol sat at the Guildhall, Bristol, on the 14th inst., to hear an appeal on the part of the Bristol Brewery Co. (Messrs. Georges & Co.) against a decision of the Bristol magistrates relative to an alteration made to the front of the Jolly Colliers public-house, West-street, Bedminster. Mr. Macmorran, K.C., and Mr. Weatherly were counsel for the Brewery Co., and Mr. Foote, K.C., and Mr. Metcalfe were for the Corporation of Bristol. Messrs. Georges were summoned for omitting to rebuild the front of the beerhouse in question, of which they are owners, after pulling

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down part of it, according to the provisions of the Bristol Improvement Acts, 1840 and 1847.

The case was heard by the Bristol magistrates on January 31. The particulars then related were that in October some alterations were made at the Jolly Colliers, to effect which part of the front of the house, including the stone sill of the window, was taken down. No notice had then been given the city authorities of the alterations. On October 21 a building inspector passed, and observing the work going on, he reported the matter to Mr. Yabbicom, the District Surveyor. A letter was sent at once to Messrs. Georges (on October 22), and the same day a representative of the builder carrying out the alteration called at the office of the surveyor and made an entry in a register giving the requisite notice. The work was completed without the front being set back, according to the requirements of the Streets Improvement Committee. A week or so later the decision of the magistrates was given. The justices came to the conclusion that the sill must be considered part of the front or external wall. They were, therefore, of opinion that such alteration was made to the external wall as would give the Corporation the right to demand that the owners should set back their premises in the manner demanded. They did not think that the company intended to give instructions that the sill should be removed, but their instructions on that point were not explicit. Under the circumstances, although they had given judgment in accordance with law, they thought it bore with great hardship upon the company, and the justice of the case would be fully met by inflicting upon them a fine of 6d.

Mr. Foote stated the particulars of the case to the Recorder, and a long argument ensued between counsel and his Honour regarding the provisions of the Act bearing upon the matter.

The Recorder allowed the Appeal, and in giving his decision said his impression was that the taking down of a portion of the front for the purposes of rebuilding or repairing did not come within the meaning of Section 17 of the Act. It was a taking down incidental to the alteration of the window-frame. He considered that the question whether the sill was or was not part of the frame was not material. His Honour consented to state a case.—*Bristol Times.*

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

22,549.—AN APPLIANCE FOR LIFTS: *G. W. Jackson and E. O. Fearnley.*—To the bottom of the cage is pivoted a lever which is held up with an adjustable spring and carries a gripper at its remoter end. If the lifting rope break, the spring will come into play so as to pull the lever up and throw the gripper into action that it may stop the falling of the cage.

22,578.—A WATER-PRESSURE INDICATOR: *Luysche Industriewerke A.-G.*—The invention relates to apparatus for transmitting pressure from a conduit to an instrument that works a pressure-recording apparatus or the switch of the circuit of an alarm bell at the waterworks; between the registering apparatus and the water conduit the inventors arrange a set of pipes to which air vessels are attached, and in order that the apparatus shall not respond to temporary changes in the pressure they put in each joint between the flanges of the pipes a metallic disc which is pierced at its middle point and has a covering of wire gauze on each of its two sides.

22,596.—A COLOURING FOR STAINED GLASS: *N. Meurer.*—For imparting a yellow, brown, red, or black hue to the glass the inventor adds to it, when in a molten condition, ground and sifted brown coal or lignite.

22,618.—A FITTING FOR INCANDESCENT GAS-LAMPS: *W. Harris.*—For the purpose of minimising vibration the screw-threaded pipe which takes the burner-fitting is inserted through the upper end of an inverted attachment in the shape of a cup and made of indiarubber or some such material, to which it is fastened with washers. The lower end of the cup is stretched over the upper end of a metallic piece that can be screwed on to the bracket or other holder; the washers may be made of asbestos or other non-heat-conducting substance, and recesses cut in the metallic piece will engage with ribs fashioned upon the indiarubber attachment.

22,620.—AN APPLIANCE FOR USE WITH DOORS: *R. Watt.*—A door can be maintained in the opened position or fastened when it has been shut, by means of a hook that is joined to brackets secured to the frame of the door with two joints at a right angle to one another; the hook is to be engaged with an eye when one wishes to keep the door opened, and into another eye when it is to be shut. In another form the latter eye is discarded, and an arm upon the hook which passes behind a hook upon the door serves to fasten the door.

22,625.—DRESSING-BOXES FOR BATHS: *F. R. R. F. Pearce.*—Two leaves which are joined together with lifting or detachable butt-hinges constitute each partition. The upper end of the inner leaf is sustained with a sliding hinge and a pivot. Its lower end rests upon a rising pivot, having locking recesses and sloped surfaces. Each outer leaf is kept in its place with cross-hooked distance-rods and slotted hinged plates that engage with projections from plates upon the ceiling underneath the gallery of the bath. To the inner leaves are affixed slotted plates which engage with T-headed studs that project from plates at the ends of the seats. The doors and leaves can, upon occasion, be stowed away in recesses made in the walls.

22,691.—IMPROVEMENTS IN FIRE-ESCAPES: *F. C. Hudson.*—For lifting the ladder of a portable fire-escape into a vertical position the hinged frame is turned over, and then a pulling of a crossbar turns the ladder upon its fulcrum on the hose-box until a spring hook at the end of the ladder engages with the lower end of the frame. On the end of the ladder are spikes to be driven into the ground, and a spring pawl is fitted for the winding gear. For the ladders, which can be used separately by lifting the trunnions out of their bearings, confer Nos. 2,841, of 1889; 2,696, of 1892; and 5,330, of 1894.

22,666.—AUTOMATICAL APPARATUS FOR VENTILATORS, AIR-SUPPLY VALVES, &C.: *H. Simpson and R. Thomlinson.*—To meet a change of temperature, and to show its variations at a distance, the air-valve spindle is joined to a lever which is coupled adjustably with another lever pivoted upon the casing, and of which one end constitutes a pointer that traverses a graduated scale, whilst the other end is acted upon by the expanding end-piece of a Tobin tube; at one end of the tube is a nozzle which supports a rubber bag so bound round with wire that it can expand only axially; expansion or contraction of the liquid in the tube is communicated to a tube attached to the bag; other arrangements provide for use of the apparatus to sound a fire-alarm, to open a ventilator, and to regulate the supplies of hot and cold air in a combined system of heating and ventilating in hospitals and other buildings.

22,675.—A HINGE FOR MATHEMATICAL COMPASSES: *E. T. Boden.*—The knee or head joint of a flat-armed compass for mathematical purposes is formed with a portion of an arm which is held with a screw between a bent arm and a plate; a removable clamping-screw turns in engagement with a slot cut in the upper end of the plate; the bent arm restricts the movement of the part, and it may be fashioned so as to form an oblique stop: the contrivance is equally available for use with dividers.

22,730.—A METHOD OF GLAZING ROOFS: *W. R. Lester.*—A leaden or other soft and non-corrodible metallic sheathing is applied to iron or steel astragals, or bars, the covering being shaped or rolled so as to provide drainage channels with bedding-ribs above them and wings that can be folded downwards over the sheets of glass; otherwise, a drawn or rolled sheath of lead is nailed on to a rebated wooden astragal. Confer also Nos. 3,254 and 13,314 of 1884, and 9,422 and 11,831 of 1890.

22,788.—SPIGOT-AND-SOCKET PIPE-JOINTS: *H. L. Doulton and C. E. Morris.*—For earthenware pipes and conduits for electrical cables, and for casting rings of composition around the outside of the spigot and in the inside of the socket. The internal pieces, which are of rubber, are to be expanded by compression through screws and rods, in the case of a mould for joint-rings upon a two-duct conduit. In the case of joint-rings and pipes of an oblique joint for a three-duct rectangular conduit, the spigot joint-pieces are formed upon two opposite sides from a sphere whereof the centre is at the intersection of the axes of the conduit and a cylinder, the axis of the cylinder being at a right-angle to that of the conduit, and upon the other two sides from the cylinder. The joint-surfaces within the socket are parallel throughout to the conduit.

22,810.—APPLIANCES FOR LIFT, SAFETY, AND OTHER VALVES: *G. M. Marchant and W. Marchant.*—A renewable seat is fashioned in the shape of a pierced sleeve, at the lower end of which is a seating-ring. In the sleeve and in the adjacent part of the casing is a groove which takes a packing-ring, which is held down by the cover or by other means. On the cover may be fitted flexible projections for effecting a close joint with the casing of the valve. An expansible joint for the connecting pipes is formed either by putting a conical packing-ring around the pipe and making the ring fast with a screwed sleeve or gland, or by bolting the gland on to the sleeve. A relieving device for the upper portion of a safety-valve comprises a spindle whereof the upper end has a pin with two short levers hanging from its ends. A fork joins a hand-lever to the lower ends of the two short levers, so that when at work it will draw them up against inclined planes upon the valve-casing, and so lift the valve itself.

22,823.—ROOF-GIRDERS: *H. R. Vaughan and Patent Vulcanite Roofing and Asphalte Co.*—The struts of wooden lattice or trellis girders for flat roofs are secured between pairs of beams, bow-shaped ribs, and upper beams. The joists or purlins are fastened between the ends of the struts, and there are vertical or inclined struts for strengthening purposes. A thick layer of sand and gravel is laid over impregnated roofing felt applied, together with vulcanite composition, to the boards which cover the joists. In the case of a Mansard roof having a kerb, and covered with tiles, &c., a similar kind of construction is available, and the inventors claim that large spans can thus be obtained without the employment of columns or obstructive means of support.

22,853.—A METHOD OF HEATING, COOLING AND VENTILATING BUILDINGS: *D. W. Anderson, E. B. Thaw, F. F. Chalmers, & F. T. Wright.*—Air is caused to circulate through passages or conduits which extend in effect throughout the whole area of the walls of the building. For a system of heating, for instance, the interlocking tile-sections of the wall-facing have crossed and perforated projections which will divert ascending currents of air along horizontal conduits; the tiles have grooves and tongues, and their outer surfaces are roughened or grooved to take the plaster; they may also be nailed on to the walls. Radiating-pipes join the heater to the lower conduit between the walls and the bottom tiles, and registers are arranged in convenient places.

22,891.—A CAMERA-LUCIDA FOR MAKING DRAWINGS IN PERSPECTIVE: *G. Buchberger.*—The drawing is produced by the combination of geometrical plane views which are taken, in front of the camera, upon a vertical board that can be turned about its vertical axis for varying the distances from the camera of the different parts of the object; thus the face, for example, of a box may be drawn from a rectangle, then its back-face can be similarly drawn by a further adjustment of the board which carries the views. The perspective drawing will be finished by the joining-up of the corners.

22,900.—A CONTRIVANCE FOR THE FRAME OF A RECIPROCATING SAW: *G. Pickles.*—Short, instead of the customary long, connecting rods are devised, and they are bolted on to a cross-head to which another pair of rods is bolted—the latter being joined to the middle of the moveable saw-frame and passed inside the fixed side-frames, whilst the former rods are set to pass on the outer side of the fixed side-frames.

22,921.—CASEMENT-STAYS: *A. Illidge.*—The stay is jointed to the casement window in such a manner that the holes in it may be adjusted with the holding-peg. The hole in the bent end of the stay through which the main-pin is inserted is either oval or counter-sunk, whereby one can raise the stay, whilst, when the stay is in its normal place, any shaking will be obviated.

23,084.—BRICKLAYING MACHINES: *F. H. Knight.*—For building, say, a 14-in. wall a line of stretchers is laid by hand after the machine has laid a 9-in. course at one side of the wall. The machine is then caused to slide upon cross-rods into position for laying a 9-in. course at the other side, which course is finished with a line of stretchers. Pairs of rollers, coupled with chains and gear-wheels, and moved with a handle, are substituted for racks or chains to move the machine, and its motion on the girder is retarded with a drag or weighted brake-lever, whilst the rollers press the bricks home. By another adaptation a hand-lever and a pawl serve to so press the bricks, a cross-piece on the pawl rests upon a guiding strip; or the four arms or blades of a paddle-wheel, turned by power or the hand, will effect that purpose; a hand-lever fitted with a pawl for engagement with a pierced plate upon the girder feeds the machine forwards. (Cf. also Nos. 21,823 of 1899 and 5,167 of 1900.)

23,160.—AN ADJUSTMENT FOR T-SQUARES: *F. Beldous.*—In order to maintain the T-square in its place upon the drawing-board, the inventor screws a strap on to the tail of the square, and mounts a rod upon the strap. Lugs from the rod slide along a frame that carries rollers which are sustained with springs, and are forced against the side of the board by another spring set between a collar and a piece that projects from the rod.

23,211.—FIREPROOF PARTITIONS FOR BUILDINGS: *Fireproof Partition Syndicate and T. I. Cammell.*—To enable the partitions to expand under the influence of a fire, the top or bottom of the metallic framework is secured to the joists, whilst the bottom or top is caused to slide upon or between bars correspondingly placed. Slotted standards are bolted to T-irons affixed to the upper joists and will slide upon slotted T-irons affixed to the lower joists. Metallic lathing may be fastened to the standards, or the lower sheets may be caused to slide between lower angle-bars secured to the joists, the upper sheets being bolted between upper angle-bars.

23,222.—INCANDESCENT LIGHTING: *S. Zickenheiger.*—For a powerful light and without compressed air or gas is devised a burner of about double the usual cross-sectional area, combined with a long chimney or flue; noise arising from the vibration of air in a cylindrical chimney is prevented, and a spreading of the flame is enabled, by means of an enlargement of the lower end of the chimney. The gallery is fitted so as to admit only a small quantity of air to cool the burner, or to exclude air altogether. The burner tubes repose loosely upon their fittings, to provide for the easy removal of the parts, and the length of the chimney can be varied in respect of the cross-sectional area of the burner.

MEETINGS.

FRIDAY, APRIL 18.

Architectural Association Discussion Section.—Mr. A. Needham Wilson on "A Tour through the South of France," 7.30 p.m.

Royal Institution.—Right Hon. Sir John H. A. Macdonald on "The Autocar," 9 p.m.

Institution of Mechanical Engineers.—Mr. E. F. Atkinson on "The Standardisation of Pipe Flanges and Flange Fittings," 8 p.m.

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Institution of Civil Engineers.—(Students' Meeting).—Mr. H. C. M. Austen on "The Erewash Valley Widening and Toton Sidings." 8 p.m.

SATURDAY, APRIL 19.

British Institute of Certified Carpenters.—Visit to the Prudential Buildings, High Holborn. 3 p.m.

Liverpool Architectural Society (Incorporated).—An Excursion to the new Gladstone Memorial Library at Hawarden. The Church and the Castle will be visited if time permit. Tea at the Glynn Arms Hotel at 5.30.

Edinburgh Architectural Association.—Visits: (1) To Traquair House; (2) The Tower of Innerleithen.

MONDAY, APRIL 21.

Royal Institute of British Architects.—Mr. Alex. N. Paterson, M.A., on "Tradition in Architecture: its Function and Value." 8 p.m.

Society of Arts (Cantor Lectures).—Mr. R. T. Glazebrook, M.A., on "Glass for Optical Instruments." II. 8 p.m.

TUESDAY, APRIL 22.

Institution of Civil Engineers.—Mr. F. W. Webb on "Locomotive Fire-box Stays." 8 p.m.

Builders' Clerks' Benevolent Institution. — Twenty-fourth annual dinner, King's Hall, Holborn Restaurant. 6.30 p.m.

WEDNESDAY, APRIL 23.

Institution of Civil Engineers.—(1) Students' visit to the works of the Great Northern and City Railway, in course of construction. 2.30 p.m. (2) (Special meeting) The tenth "James Forrest" lecture. Sir William Chandler Roberts-Austen, F.R.S., on "Metallurgy in Relation to Engineering." 8 p.m.

Society of Arts.—Professor Silvanus P. Thompson, D.Sc., on "Opto-Technics." 8 p.m.

Edinburgh Architectural Association.—Annual Business Meeting and President's Valedictory Address. 8 p.m.

THURSDAY, APRIL 24.

Society for the Encouragement of the Fine Arts.—Mr. C. E. Keyser on "Some Ancient Wall Paintings."

Institution of Electrical Engineers.—1. Adjourned discussion on paper by Messrs. J. Swinburne and W. R. Cooper on "Problems of Electric Railways." 2. "Form of Model General Conditions, for Use in Connection with Contracts for Plant, Mains, and Apparatus for Electricity Works," as drafted by a Committee, and presented to the Council for adoption as the model general conditions recommended by the Institution of Electrical Engineers. 3. Nominations for the Council for 1902-1903. 8 p.m.

FRIDAY, APRIL 25.

Architectural Association.—1. Mr. E. A. Gruning on "Arbitrations." 2. Nomination of Officers for Session 1902-1903. 7.30 p.m.

Royal Institution.—Mr. J. Mackenzie Davidson, M.B., on "X-Rays and Localisation." 9 p.m.

Glasgow Architectural Craftsmen's Society.—Business meeting.

SATURDAY, APRIL 26.

Architectural Association.—Spring Visit (1) to the new fire-station, Perry-vale, Forest Hill, S.E.; (2) to Horniman's Museum.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 3.—By HARDS & BRADLY (at Greenwich).

Greenwich.—6, Luton-pl., f., y.r. 28*l.*	£490
54, Winforton-st., f., w.r. 13*l.*	205
6, Maidenstone Hill, f., w.r. 19*l.* 10s.	275
4 and 6, Orchard Hill, f., w.r. 39*l.*	575
8 to 11, Bell-st., f., w.r. 84*l.* 10s.	1,135
21 to 29 (odd), Edward-st., area 9,500 ft., f., w.r. 115*l.* 14s.	1,625
19, Edward-st., with yard and stabling, f., w.r. 58*l.* 10s.	735
49, Church-st., f., y.r. 26*l.*	440
32, Prior-st., u.t. 27 yrs., g.r. 10*l.* 10s., y.r. 28*l.*	150
26, South-st., u.t. 45 yrs., g.r. 5*l.*, y.r. 40*l.*	400
34, South-st., u.t. 45 yrs., g.r. 35., y.r. 32*l.*	515
Lewisham.—Leahurst-rd., f.g.r. 5*l.*, reversion in 97 yrs.	100

April 4.—By WYATT & SON (at Bognor).

Bognor, Sussex.—London-rd., Marlborough House (S), f., y.r. 30*l.*	830
18 and 19, Chapel-st., u.t. 932 yrs., g.r. nil, w.r. 15*l.* 12s.	140

By ANDREW ORR (at Filey).

Muston, Yorks.—Carr House Farm, 87 a. 3 r. 31 p., f., p.	3,450
Various enclosures of land, 51 a. 1 r. 25 p., f.	2,800

April 7.—FIELD & SONS.

Southwark.—Lansdowne-place, a freehold block of land, area 2,600 ft., p.	400
Herne Hill.—27, Milton-rd., u.t. 74½ yrs., g.r. 6*l.* 15s., e.r. 36*l.*	285
Hyde Park.—30, Cambridge-st., u.t. 21 yrs., g.r. 10*l.*, y.r. 100*l.*	880

April 8.—By EDWIN EVANS.

New Oxford-st.—No. 116 (s.), u.t. 23 yrs., g.r. 52*l.* 10s., e.r. 400*l.*	3,200
Fulham.—Melmoth-pl., &c., i.g.r. 475*l.*, u.t. 68 yrs., g.r. 150*l.*	5,950
Balham.—26, Old Park-av., u.t. 86½ yrs., g.r. 10*l.* 10s., p.	695
Stockwell.—3, Stockwell Park-rd., f., y.r. 36*l.*	615
Chiswick.—35, Stile Hall-gdns., u.t. 88 yrs., g.r. 8*l.*, y.r. 38*l.*	375

By FRITH, GARLAND, & Co.

Harringay.—104, Allison-rd., u.t. 93 yrs., g.r. 7*l.*, q.r. 35*l.*	340
8, Colina-rd., u.t. 78 yrs., g.r. 6*l.*, e.r. 39*l.*	235
71, Wightman-rd., u.t. 92 yrs., g.r. 7*l.* 7s., y.r. 38*l.*	400
77, Lothair-rd., u.t. 75 yrs., g.r. 6*l.* 6s., e.r. 36*l.*	325
Hornsey.—9, Waldegrave-rd., u.t. 77 yrs., g.r. 6*l.*, e.r. 34*l.*	300
Caledonian-rd.—26, 27, and 29, Market-st., u.t. 51 yrs., g.r. 12*l.*, y.r. 116*l.*	£1,290
40, Market-st. (s), u.t. 40¾ yrs., g.r. 5*l.*, e.r. 50*l.*	350

By E. & H. LUMLEY.

Balham.—222, High-rd., u.t. 33 yrs., g.r. 12*l.*, y.r. 112*l.*	1,030

By ROGERS, CHAPMAN, & THOMAS.

Bayswater.—2, Queen's-rd. (s), area 750 ft., f., p.	4,100

By HUMBERT & FLINT (at Watford).

Watford, Herts.—28 and 30, Salisbury-rd., f., w.r. 31*l.* 4s.	350
Liverpool-rd., a freehold building plot	250
Abbots Langley, Herts.—46 to 52 (even), Marlins-sq. f., w.r. 7*l.* 18s.	1,090

By GODFREY C. LAMBERT (at New Barnet).

East Barnet, Herts.—Church Hill, Ivy Cottage, Old School Cottage, and Old School House, f., y.r. 39*l.*	375

April 9.—By MARTEN & CARNABY.

Dulwich.—8, South Croxted-rd., u.t. 54 yrs., g.r. 8*l.*, e.r. 40*l.*	335

By T. G. WHARTON.

Notting Hill.—18, Silver-st. (S) and workshops in rear, f., y.r. 90*l.*	1,700

By DOUGLAS YOUNG & Co.

Wandsworth.—3 and 5, Lebanon-gdns., u.t. 75 yrs., g.r. 13*l.*, y.r. 64*l.*	650
21, 23, and 29, Lebanon-gdns., u.t. 75 yrs., g.r. 18*l.* 10s., y.r. 83*l.*	750
Clapham.—29, Lansdowne-gdns., u.t. 41 yrs., g.r. 9*l.* 9s., q.r. 45*l.*	420

April 9.—By DANIEL WATNEY & SONS.

Vauxhall.—56 to 71, Princes-rd.; 1 to 25 (odd), Vauxhall-st., and 102 to 128 (even), Sancroft-st. (a block of houses, shops, and builder's yard), area 53,300 ft., f., w.r. 1,329*l.* 2s.	15,000
27 to 37 (odd), Vauxhall-st., and 109 and 111, Sancroft-st., area 10,000 ft., f., w.r. 323*l.* 14s.	2,900
91 to 107 (odd), Sancroft-st., and 3 to 21 (odd), Orsett-st., f., w.r. 500*l.* 10s.	4,650
39, 41, 43, and 43B, Vauxhall-st., and 1, Orsett-st., area 4,800 ft., f., w.r. 156*l.*	1,400
49 to 57 (odd), Vauxhall-st., f., w.r. 159*l.* 18s.	1,500
47, Vauxhall-st., also the Derby Arms b.-h., and 2 and 4, Orsett-st., f., y.r. 103*l.* 14s.	2,000
6, 6A to 24 (even), Orsett-st., and 1 to 21 (odd) Frank-st., area 17,900 ft., f., w.r. 543*l.* 8s.	5,025
23 to 35 (odd), Frank-st., f., w.r. 157*l.* 6s.	1,400
60, Newburn-st., and 37 to 43 (odd), Frank-st., f., w.r. 130*l.*	1,200
33 to 61 (odd), and 51½, Newburn-st., and 1 to 8, Garden-cottages, area 20,400 ft., f., w.r. 596*l.*	5,600
Newburn-st., Prince of Wales b.-h., f.g.r., 20*l.*, reversion in 45 yrs.	630
62 to 72 (even), Newburn-st.; 2 to 36 (even), Frank-st.; 1 to 23 (odd), Malmsey-pl.; 1 to 9, Hampshire-st.; 59 to 83 (odd), Vauxhall-st.; area 44,650 ft., f., w.r. 1,517*l.* 15s.	12,200
40, 42, and 44, Vauxhall-st., f., w.r. 136*l.* 10s.	1,425
Vauxhall-st., The Eclipse b.-h., f., y.r. 62*l.*	1,550
1, 3, 5 and 7, Jonathan-st., f., w.r. 122*l.* 4s.	1,100
34 and 36, Vauxhall-st. (s.), f., y.r. 75*l.* 16s.	1,025
18 to 32 (even), Vauxhall-st., f., w.r. 275*l.* 12s.	3,000
Vauxhall-st., the George and Dragon p.-h., a freehold rental of 80*l.*, reversion in 15 yrs.	3,150
2 to 14 (even), Vauxhall-st., area 18,400 ft., f., w.r. 254*l.* 16s.	3,000
2 [to 8 (even), Jonathan-st.; 1 to 6, 8 to 12, St. George's-cottages, area 13,000 ft., f., w.r. 354*l.* 18s.	2,800

April 10.—By COOPER & GOULDING.

Wandsworth.—186, 190, 192, and 194, Earlsfield-rd., u.t. 89 yrs., g.r. 24*l.*, w.r. 148*l.* 4s.	1,150
Holloway.—1, Yerbury-rd., u.t. 65 yrs., g.r. 1*l.*, y.r. 55*l.*	520
27a, Verbury-rd., u.t. 65 yrs., g.r. 2*l.* 10s., y.r. 45*l.*	570
97, Lady Margaret-rd., u.t. 67 yrs., g.r. 8*l.* 15s., y.r. 45*l.*	585
Kentish Town.—49 and 51, Prince of Wales-cres., u.t. 20 yrs., g.r. 10*l.* 10s., y.r. 68*l.*	380

By FAREBROTHER, ELLIS, & Co.

Paddington.—5, Eastbourne-mews (C arch), u.t. 36½ yrs., g.r. 5*l.*, y.r. 20*l.*	235
Hampstead.—17, New-end, f., y.r. 20*l.*	255
7, New-end-sq., f., y.r. 20*l.*	400

By PHIBBS GIBSON, & Co.

Purleigh, Essex.—Oakleigh Lodge and 4 acres, f., p.	600
Dulwich.—2, Eastmearn-rd., u.t. 81½ yrs., g.r. 8*l.* 10s., e.r. 50*l.*	650
Norwood.—77 and 79, Thurleston-rd., f., y.r. 74*l.*	1,075
Thurleston-rd., f.g.r. 7*l.* 10s., reversion in 88 yrs.	180

By CHARLES HALL.

Balham.—115, Ramsden-rd., u.t. 66 yrs., g.r. 5*l.* 12s. 6d., e.r. 32*l.*	320

By PERCIVAL HODSON.

Holloway.—62, Grove-rd. (S), u.t. 47 yrs., g.r. 8*l.*, y.r. 42*l.*	400
Stroud Green.—86, Upper Tollington Pk., u.t. 74½ yrs., g.r. 12*l.* 10s., e.r. 70*l.*	650

By HOLCOMBE, BETTS, & WEST.

Surbiton, Surrey.—3, 6, and 7, Wyburn-villas, f., y.r. 165*l.*	2,195
South-ter., f.g.r. 20*l.*, reversion in 45 yrs.	910
7, South-ter., f., y.r. 55*l.*	910
4, Wyburn-villas, f., p.	580
Norbiton, Surrey.—1, Coombe-lane, f., w.r. 16*l.* 18s.	195

C. C. & T. MOORE.

Oxford-street.—119, Wardour-st. (S), u.t. 15 yrs., g.r. 70*l.*, w.r. 172*l.* 18s.	430
Hackney-rd.—80, Pritchard's-rd., u.t. 38 yrs., g.r. 3*l.* 3s., w.r. 31*l.* 4s.	225
Mile End.—133, Coutt's-rd., f.; also 135, Coutt's-rd., u.t. 5 yrs., g.r. 27*l.*, e.r. 67*l.* 12s.	350
Snaresbrook.—Hermon Hill, 1, Oaklands, f., e.r. 80*l.*	1,170

April 10.—NEWBON, EDWARDS, & SHEPHARD.

Marylebone.—35, Great Titchfield-st., u.t. 30¾ yrs., g.r. 24*l.*, y.r. 100*l.*	920
Highbury.—18 and 19, Aberdeen Pk., u.t. 53 yrs., g.r. 31*l.*, y.r. 240*l.*	1,240
11, Highbury-grove, f., y.r. 70*l.*	1,160
Crouch End.—72 to 78 (even), Park-rd., u.t. 30 yrs., g.r. 15*l.*, y.r. 119*l.*	680
Clapton.—39, Elmcroft-st., u.t. 90 yrs., g.r. 5*l.* 15s., w.r. 41*l.* 12s.	380

By WORSPOLD & HAYWARD.

Peckham.—50 to 58 (even), Clifton-rd., u.t. 39 yrs., g.r. 20*l.*, w.r. 184*l.* 12s.	£1,100

By STIMSON & SONS.

Bloomsbury.—131, Gower-st., u.t. 16¾ yrs., g.r. 15*l.*, y.r. 140*l.*	950
Camberwell.—62, Grove Hill-rd., u.t. 74½ yrs., g.r. 7*l.*, y.r. 30*l.*	285
1 and 5, Bromar-rd., u.t. 74½ yrs., g.r. 13*l.*, y.r. 60*l.*	545
Forest Gate.—208, 210, 212 and 214, Romford-rd., u.t. 37½ yrs., g.r. 22*l.*, y.r. 150*l.*	1,320
Herne Hill.—36, Fawnbrake-av., u.t. 93½ yrs., g.r. 7*l.*, e.r. 45*l.*	510
Peckham.—29, Banstead-st., u.t. 74½ yrs., g.r. 4*l.* 15s., w.r. 39*l.*	180
South Kensington.—5, Cromwell-cres., u.t. 66 yrs., g.r. 12*l.*, e.r. 100*l.*	740
Sydenham.—Panmure-rd., Hensill, u.t. 60½ yrs., g.r. 8*l.* 10s., y.r. 40*l.*	300
Walthamstow.—118, 120, 122, 124, 130 and 132, Maynard-rd., f., y.r. 120*l.*	1,950

By JOSEPH STOWER.

Mill Hill.—1 and 2, Station-ter. (S), u.t. 95 yrs., g.r. 15*l.*, y.r. 80*l.*	600
Lambeth.—16 to 28 (even), Everett-st., u.t. 41 yrs., g.r. 22*l.* 10s., w.r. 152*l.* 2s.	610
Hampstead.—Buckland-cres., i.g r. 36*l.*, u.t. 49½ yrs., g.r. 4*l.*	610
Belsize Pk., i.g.r. 275*l.*, u.t. 49½ yrs., g.r. 2*l.* 11s.	5,155
Crossfield-rd., i.g.r. 21*l.*, u.t. 49½ yrs., g.r. 4*l.*	390
Lancaster-rd., i.g.r. 14*l.*, u.t. 49½ yrs., g.r. 2*l.*	265
Belsize-sq., i g.r. 360*l.*, u.t. 49½ yrs., g.r. 1*l.*	6,730
Belsize Pk.-gdns., i.g.r. 140*l.*, u t. 49½ yrs., g.r. 3s. 6d.	2,595
Belsize-av., i.g.r. 16*l.*, u.t. 49½ yrs., g.r. 1s.	300

By BATCHELAR & SON (at Croydon).

Carshalton.—Westmead-rd., freehold premises (formerly the Albany Laundry), f., p.	300

By HOOKER & WEBB (at Croydon).

Croydon.—24 and 25, Waddon New-rd., and 2 and 3, Upper Drayton-pl., f., w.r. 62*l.* 8s.	720
1, Sutherland-rd., f., w.r. 26*l.*	265
Beddington.—Guy-rd., The Forge, with goodwill of blacksmith's business, f., p.	160

April 11.—By C. W. DAVIES & SON.

Islington.—5, Cambridge-ter., u.t. 456 yrs., g.r. 8*l.*, e.r. 50*l.*	650
6, Oxford-ter., u.t. 452 yrs., g.r. 8*l.*, w.r. 62*l.* 8s.	550
Stoke Newington.—148, Albion-rd. (S), f., y.r. 70*l.*	1,175
New Cross.—35 to 41 (odd), Somerville-rd., u.t. 48 yrs., g.r. nil, w.r. 140*l.* 8s.	1,395
62, Somerville-rd., u.t. 48 yrs., g.r. nil, w.r. 33*l.* 16s.	310
22 and 24, Bolden-st., u.t. 65 yrs., g.r. 9*l.*, q.r. 56*l.*	775

By HENRY HOLMES & Co.

Kentish Town.—51, Castle-rd, u.t. 33 yrs., g.r. 5*l.* 10s., y.r. 36*l.*	260
45, Castle-rd., u.t. 33 yrs., g.r. nil, y.r. 36*l.*	320
Haverstock Hill.—41, Herbert-st. u.t. 43 yrs., g.r. 7*l.* 8s., w.r. 50*l.* 14s.	260
Cricklewood.—17, Prospect-rd., u.t. 77 yrs., g.r. 5*l.*, w.r. 31*l.* 4s.	170

By HUNTER & HUNTER.

Peckham.—210, High-st., (S), f. y.r. 60*l.*	1,150

By GEO. E. LUCK.

Hornsey Rise.—3, Cromartie-rd., f., e.r. 55*l.*	700
Crouch End.—51, Weston-park., u.t. 79¾ yrs. g.r. 10*l.*, e.r. 55*l.*	535

By E. & S. SMITH.

City of London.—1 and 2, Moorgate-st. Buildings (offices, &c.), u.t. 32 yrs, g.r. 45*l.* 3s., y.r. 1,165*l.*	8,900
Islington.—11, Theberton-st., u.t. 13 yrs., g.r. 6*l.* 16s., y.r. 38*l.*	175
Clerkenwell.—45, Northampton-rd., u.t. 29½ yrs., g.r. 8*l.*, w.r. 52*l.*	230

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 11 6	per 1,000 alongside, in river.	
Rough Stocks and Grizzles	1 9 6	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 5 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts ..	1 12 0	,,	,, ,,
Best Fareham Red	3 12 0	,,	,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,,	,,
Do., Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 5 6	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,,
Headers	12 0 0	,,	,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers..	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,

[*See also p. 409.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Homes for Nurses	Hartshill (Stoke-on-Trent)	.....	June 16

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Asylum Extensions, Blackadon, Plymouth	.....	Hine & Odgers, Architects, Lockyer-street, Plymouth	April 22
Water-meter House, Cross Hill	Lancaster Corporation	Borough Surveyor, Town Hall, Lancaster	do.
Schools, Paisley-street	Kingston-on-Hull School Board	Surveyor, School Board Offices, Albion-street, Hull	do.
Two Houses, Lower-road, Londonderry	Mr. J. Williams	W. E. Pinkerton, Architect, 11, Shipquay-street, Londonderry	do.
Sewers, &c., Queen's-road	Winchester Town Council	City Surveyor, Town Hall, Winchester	do.
Additions to Schools	Whickham (Durham) School Board	J. W. Rounthwaite, Architect, 13, Mosley-street, Newcastle	do.
*Making-up Roads, &c.	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	do.
*Supply of Road Materials	Bromley U.D.C.	Council's Surveyor, Bromley, Kent	do.
Rebuilding Church, Wednesfield	.....	F. J. Beck, Architect, Wolverhampton	April 23
Villas, Chellow Dean, Bradford	.....	Fairbank & Wall, Architects, Bradford	do.
Chapel, Ogmore, Glam	.....	W. Richards, The Square, Ogmore Vale, Glam	do.
Additions to Workhouse	Elham (Kent) Guardians	A. Bromley, Architect, Radnor Chambers, Folkestone	do.
House and Shop, London-road, Carlisle	Messrs. J. Baty & Sons	J. H. Martindale, Architect, Carlisle	do.
Enlarging St. John's Church, Canton, Cardiff	Rev. D. Davies	G. E. Halliday, Architect, Cardiff	do.
Water Supply Works	Hamilton (N.B.) Water Commisrs	W. R. Copland, Civil Engineer, 146, West Regent-street, Glasgow	do.
Additions to Workhouse	Glennamaddy (Ireland) Guardians	R. J. Kirwin, Architect, Glennamaddy	do.
Schools, Rhosddu, Wrexham	.....	Rev. John Thomas, 47, Lorne-street, Rhosddu, Wrexham	April 24
Road Works, Lodge Estate, Rugby	.....	J. T. Franklin, Architect, Regent-street, Rugby	do.
Monument, Grand Parade, Cork	.....	D. J. Coakley, 1, Charlotte-quay, Cork	do.
Shed, &c., Arclid	Congleton R.D.C.	A. Price, Architect, Elworth	do.
Ten Cottages, New-street, Ash-next-Sandwich	.....	F. J. Ralph, Lord Warden Inn, Sandwich	do.
Main Laying, North Terrace	Mildenhall Gas Co., Ltd.	O. F. Read, Gas Offices, Mildenhall	do.
Business Premises, New George-street, Elton	Bury District Co-op. Soc., Ltd.	D. Hardman, Architect, Agar-street, Bury	do.
Business Premises, High-street, Belfast	Messrs. J. Riddel & Sons	S. P. Close, Architect, Donegall-square, Belfast	do.
Road Metal, &c.	Houghton-le-Spring (Dur.) R.D.C.	D. Balfour, Civil Engineer, Council Offices, Houghton-le-Spring	do.
*Supply of Timber	Director-General, Ordnance Survey	Ordnance Survey Office, Southampton	do.
Thirty-four Houses, Godre Aman, Aberaman	.....	T. Roderick, Architect, Aberdare	April 25
Police Buildings, &c., Uckfield	East Sussex County Council	F. J. Wood, Surveyor, County Hall, Lewes	do.
Granite Road Metal (2,000 tons)	Newmarket U.D.C.	S. J. Ennion, Deva Chambers, Newmarket	do.
Three Houses, West End Park, Londonderry	Captain Cassidy	J. P. M'Grath, Architect, 28, Carlisle-road, Londonderry	do.
Foundation Works	Boston (Lincs.) Town Council	J. Rowell, Architect, Borough Offices, Boston	do.
Bridge Works, &c., Aylestone	Leicester Corporation	E. G. Mawbey, Civil Engineer, Town Hall, Leicester	do.
Cast Iron Water Main, Dittisham	Totnes R.D.C.	W. F. Tollit, Surveyor, Totnes	do.
Earth Closets, Schools, Ashford, Middlesex	West London School District	Superintendent, at Schools, Ashford	do.
Setting Boilers, &c. (Electric Lighting)	Maidenhead Town Council	Council's Surveyor, Guildhall, Maidenhead	do.
Asylum Works, Garlands, near Carlisle	.....	G. D. Oliver, Architect, 5, Lowther-street, Carlisle	April 26
Additions, &c., to Moravian Church, Swindon	.....	R. J. Beswick, Architect, 35, Regent-street, Swindon	do.
Bridges, Greentrees, &c.	Cockermouth R.D.C.	J. B. Wilson, Civil Engineer, Court Buildings, Cockermouth	do.
Farm Buildings, Supperton	Marquis Conyngham's Trustees	G. Smith, Architect, Station-road, Canterbury	April 27
*Hair Picking, &c., Rooms, Leavesden Asym., Watford	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	April 28
Inn, Gothenburg, Limphinnans (N.B.)	.....	W. Birrell, Architect, 200, High-street, Kirkcaldy	do.
School, Fleur-de-Lis, Monmouth	.....	R. L. Roberts, The Firs, Abercarn, Mon.	do.
Business Premises, near Waterhouses	Esh Co-operative Society	W. & T. R. Milburn, Architects, Sunderland	do.
Alterations to Technical Institute	Salford Corporation	H. Lord, Architect, Deansgate, Manchester	do.
Villa, Sunnyside, near Montrose	Montrose Royal Asylum	J. Sim, Architect, 160, High-street, Montrose	do.
Sewers, &c., Scotswood, Northumberland	Benwell and Fenham U.D.C.	H. W. Taylor, C.E., St. Nicholas Chmbrs Newcastle-on-Tyne	do.
*Making-up Cunnington-lane	Acton District Council	Council's Surveyor, 242, High-street, Acton	April 29
*Penshurst Waterworks	Sevenoaks R.D.C.	T. Hennell, Engineer, 6, Delahay-street, Westminster, S.W.	do.
Sewers, Aylesford and Burham	Malling (Kent) R.D.C.	H. Robinson, C.E., Parliament Mansns., Victoria-st., Westminster	do.
Hospital, Spring Hill, Meltham, near Huddersfield	Colne and Holme Hospital Com.	J. Berry, Architect, 3, Market-place, Huddersfield	do.
Reconstructing Bridge, Charvill, Berks	.....	J. Morris, Surveyor, 156, Friar-street, Reading	April 30
Subway Works, Scarborough	North Eastern Railway Co.	W. J. Cudworth, Engineer, York	do.
Well Sinking, near New Spring Farm	Biggleswade Water Board	G. F. Deacon, Engineer, 16, Great George-street, S.W.	do.
*Making-up Dagmar-road	Wood Green U.D.C.	Council's Surveyor, Town Hall, Wood Green, N.	do.
*Making-up Roads	Ealing Town Council	Council's Engineer, Town Hall, Ealing, W.	May 1
Additions to Church, Ventonleague, Hayle, Cornwall	.....	S. Hill, Architect, Green-lane, Redruth	May 3
*Farm Buildings, Chadwell Heath Asylum, Essex	West Ham Council	Council's Engineer, Town Hall, West Ham, E.	do.
*Seven Houses and Shops, Wallington, Surrey	.....	Warrant & Stupart, Architects, 385, Green-lanes, Harringay, N	May 5
*Making Good Roads	Hornsey U.D.C.	Council's Engineer, Southwood-lane, Highgate, N.	do.
*Relaying Floors at St. Dunstan's-road Infirmary	Parish of Fulham	Clerk to the Guardians, Guardians' Offices, Fulham Palace-road	May 8
*Receiving Home for Children	St. Pancras Guardians	A. E. Pridmore, Architect, 2, Broad-street Buildings, E.C.	do.
Rebuilding 5, Hamilton-terrace, Bundoran	.....	S. Jevons, Architect, Armagh	May 10
*Supply of Oils and Colours, &c.	Croydon School Board	The Clerk, Katharine-street, Croydon	May 13
*Cast Iron Pipes, Valves, and Hydrants	Rochester Corporation	City Surveyor, Guildhall, Rochester	May 15
*House for Private Patients	Dorset County Lunatic Asylum	G. T. Hine, Architect, 35, Parliament-street, S.W.	May 22
*Home for Nurses, Hartshill	North Staffs Infirmary & Eye Hosp.	Not stated	June 2
Drainage Works, Belhaven, N.B.	Council of Dunbar	W. A. Carter, Civil Engineer, 5, St. Andrew-square, Edinburgh	No date
Additions to Washington Church, Newcastle	.....	Hicks & Charlewood, Architects, 67, Westgate-road, Newcastle	do.
Church, Windsor-road, Cardiff	.....	Seddon & Carter, Architects, St. Mary-street, Cardiff	do.
Mission Room, Blaina, Mon.	.....	do.	do.
Additions to Farm, Blawith, Alverston	Mr. A. P. Bridson	J. Bell, Architect, Coniston	do.
House, Esholt, Yorks.	Mr. J. W. Dixon	W. Jones, Architect, 2, Hamilton-place, Leeds	do.
Three Shops, Fairfield, Manchester	.....	Burton & Percival, Archs., 150A, Stamford-st., Ashton-under-Lyne	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Buildings and Drains Inspector	Croydon Borough Council	3*l.* per week	April 24
*Civil Engineering Assistant	Middlesbrough Corporation	Not stated	do.
*Architectural Assistant	Southampton Corporation	130*l.*	April 26
*General Assistant	do.	104*l.*	do.
*Assistant Building Inspector	do.	104*l.*	do.
*Resident Working Engineer	West Ham Union	130*l.*	April 30
*Working Engineer	do.	2*l.* 5*s.* per week	do.
*Assistant Surveyor	Croydon School Board	150*l.*	May 5

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv.* *Contracts, pp. iv. vi. viii. & x.* *Public Appointments, xix.*

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PRICES CURRENT (*Continued*).

BRICKS, &c.

	£	s.	d.		
Two Sides and one End	20	0	0	per 1,000 at	railway depot.
Splays, Chamfered, Squints	20	0	0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers	12	0	0	,,	,, ,,
Quoins, Bullnose, and Flats	14	0	0	,,	,, ,,
Double Stretchers	15	0	0	,,	,, ,,
Double Headers	14	0	0	,,	,, ,,
One Side and two Ends	15	0	0	,,	,, ,,
Two Sides and one End	15	0	0	,,	,, ,,
Splays, Chamfered, Squints	14	0	0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2	0	0	,,	less than best.
Thames and Pit Sand		7	3	per yard,	delivered.
Thames Ballast		6	0	,,	,,
Best Portland Cement		32	0	per ton,	delivered.
Best Ground Blue Lias Lime		25	0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. od. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s.	d.		
Ancaster in blocks	1	11	per ft. cube,	deld. rly. depot
Bath ,,	1	7	,,	,,
Farleigh Down Bath	1	8	,,	,,
Beer in blocks	1	6	,,	,,
Grinshill ,,	1	10	,,	,,
Brown Portland in blocks	2	2	,,	,,
Darley Dale in blocks	2	4	,,	,,
Red Corsehill ,,	2	5	,,	,,
Closeburn Red Freestone	2	3	,,	,,
Red Mansfield ,,	2	4	,,	,,
Hard York in blocks	2	10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2	8	per ft. super. at rly. depôt.	
,, ,, 6 in. Rubbed Ditto	3	0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1	3	,,	,,
,, ,, 2 in. self-faced Ditto	0	9½	,,	,,
Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube. deld. rly. depôt	
,, ,, ,, 6 in. sawn both sides landings	2	7	per ft. super. deld. rly. depôt.	
,, ,, ,, 3 in. do.	1	2½	,,	,,

SLATES.

n. in.	£	s.	d.		
20×10 best blue Bangor	12	0	0	per 1000 of 1900 at	rly. dep.
,, best seconds ,,	11	10	0	,,	,,
16×8 best ,,	6	15	0	,,	,,
20×10 best blue Portmadoc	11	5	0	,,	,,
16×8 best blue Portmadoc	6	0	0	,,	,,
20×10 best Eureka unfading green	12	2	6	,,	,,
16×8 ,, ,,	7	5	0	,,	,,
20×10 permanent green	10	5	0	,,	,,
16×8 ,, ,,	5	17	6	,,	,,

TILES.

	s.	d.		
Best plain red roofing tiles	41	6	per 1,000, at	rly. depôt.
Hip and valley tiles	3	7	per doz.	,, ,,
Best Broseley tiles	48	6	per 1,000	,, ,,
Hip and valley tiles	4	0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57	6	per 1,000	,, ,,
Do. ornamental Do.	60	0	,,	,, ,,
Hip tiles	4	0	per doz.	,, ,,
Valley tiles	3	9	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50	0	per 1,000	,, ,,
Hip tiles	4	1	per doz.	,, ,,
Valley tiles	3	8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14	10	0	16	0	0
Deals: best 3 by 9	13	10	0	15	0	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	10	10		11	10	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best		
Battens: seconds	0	10	0	,, ,,		
2 in. by 4 in. and 2 in. by 6 in.	8	10	0	9	10	0
2 in. by 4½ in. and 2 in. by 5 in.	8	0	0	9	0	0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0	10	0	more than battens.		
⅞ in.	1	0	0	,,		
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Swedish balks	2	15	0	3	0	0
Pitch-pine timber (30 ft.)	3	0	0	3	10	0

JOINERS' WOOD.

	At per standard. £	s.	d.	£	s.	d.
White Sea: First yellow deals, 3 in. by 11 in.	22	0	0	23	0	0
3 in. by 9 in.	20	0	0	21	0	0
Battens, 2½ in. and 3 in. by 7 in.	16	10	0	18	0	0
Second yellow deals, 3 in. by 11 in.	18	0	0	20	0	0
,, ,, 3 in. by 9 in.	16	10	0	18	10	0
Battens, 2½ in. and 3 in. by 7 in.	13	0	0	14	0	0
Third yellow deals, 3 in. by 11 in. and 9 in.	14	0	0	15	10	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0	12	10	0

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £	s.	d.	£	s.	d.
Petersburg: first yellow deals, 3 in by 11 in.	20	0	0	21	0	0
Do. 3 in. by 9 in.	17	0	0	18	0	0
Battens	13	0	0	14	0	0
Second yellow deals, 3 in. by 11 in.	15	0	0	16	10	0
Do. 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Third yellow deals, 3 in. by 11 in.	12	10	0	13	10	0
Do. 3 in. by 9 in.	12	0	0	13	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg:—						
First white deals, 3 in. by 11 in.	14	0	0	15	0	0
,, ,, ,, 3 in. by 9 in.	13	0	0	14	0	0
Battens	11	0	0	12	0	0
Second white deals 3 in. by 11 in.	13	0	0	14	0	0
,, ,, ,, 3 in. by 9 in.	12	0	0	13	0	0
,, ,, ,, battens	9	10	0	10	10	0
Pitch-pine: deals	16	0	0	18	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes	32	0	0	33	10	0
Broads (12 in. and up)	2	0	0	more.		
Oddments	22	0	0	24	0	0
Seconds, regular sizes	24	10	0	26	10	0
Yellow Pine Oddments	20	0	0	22	0	0
Kauri Pine—Planks, per ft. cube	0	3	6	0	4	6
Danzig and Stettin Oak Logs—Large, per ft. cube	0	2	6	0	3	0
Small ,, ,,	0	2	3	0	2	6
Wainscot Oak Logs, per ft. cube	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	7½	0	0	8
⅞ in. do. do.	0	0	7	-	-	-
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	16	0	0	20	0	0
American Whitewood Planks— Per ft. cube	0	3	0	0	3	6

Prepared Flooring—	Per square. £	s.	d.	£	s.	d.
1 in. by 7 in. yellow, planed and shot	0	13	0	0	16	6
1 in. by 7 in. yellow, planed and matched	0	13	6	0	17	6
1¼ in. by 7 in. yellow, planed and matched	0	15	0	1	0	0
6 in. at 6d. per square less than 7 in.						
1 in. by 7 in. white, planed and shot	0	11	0	0	12	6
1 in. by 7 in. white, planed and matched	0	11	6	0	13	6
1¼ in. by 7 in. white, planed and matched	0	13	6	0	15	6
6 in. at 6d. per square less than 7 in.						

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	6	2	6	7	2	6
Compound Girders ,, ,,	7	17	6	8	17	6
Angles, Tees and Channels, ordinary sections	7	17	6	8	17	6
Flitch Plates	8	5	0	8	15	0
Cast Iron Columns and Stanchions, including ordinary patterns	7	0	0	8	0	0

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON— Common Bars	7	15	0	8	5	0
Staffordshire Crown Bars, good merchant quality	8	5	0	8	15	0
Staffordshire "Marked Bars"	10	10	0	-	-	-
Mild Steel Bars	9	0	0	9	10	0
Hoop Iron, basis price	9	5	0	9	10	0
,, ,, galvanised	16	0	0	-	-	-
(* And upwards, according to size and gauge.)						
Sheet Iron, Black.— Ordinary sizes to 20 g.	10	0	0	-	-	-
,, ,, to 24 g.	11	0	0	-	-	-
,, ,, to 26 g.	12	10	0	-	-	-
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12	15	0	-	-	-
,, ,, 22 g. and 24 g.	13	5	0	-	-	-
,, ,, 26 g.	14	5	0	-	-	-
Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g.	16	0	0	-	-	-
,, ,, 22 g. and 24 g.	16	10	0	-	-	-
,, ,, 26 g.	18	0	0	-	-	-
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12	15	0	-	-	-
,, ,, 22 g. and 24 g.	13	5	0	-	-	-
,, ,, 26 g.	14	5	0	-	-	-
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12	0	0	-	-	-
,, ,, 22 g. and 24 g.	13	0	0	-	-	-
,, ,, 26 g.	14	5	0	-	-	-
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9	5	0	9	15	0

LEAD, &c.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3 lbs. & up.	13	15	0	-	-	-
Pipe in coils	14	5	0	-	-	-
Soil Pipe	16	15	0	-	-	-
ZINC—Sheet— Vieille Montagne ton	24	10	0	-	-	-
Silesian	24	0	0	-	-	-
COPPER— Strong Sheet per lb.	0	1	0	-	-	-
Thin ,,	0	1	1½	-	-	-
Copper nails ,,	0	1	1½	-	-	-
BRASS— Strong Sheet ,,	0	0	11	-	-	-
Thin ,,	0	1	1	-	-	-
TIN—English Ingots ,,	0	1	3	-	-	-
SOLDER—Plumbers' ,,	0	0	6½	-	-	-
Tinmen's ,,	0	0	8	-	-	-
Blowpipe ,,	0	0	9	-	-	-

PRICES CURRENT (*Continued*).

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d.	per ft.	delivered.
,, fourths	2¾d.	,,	,,
21 oz. thirds	3¼d.	,,	,,
,, fourths	3d.	,,	,,
26 oz. thirds	4¼d.	,,	,,
,, fourths	4d.	,,	,,
32 oz. thirds	5¼d.	,,	,,
,, fourths	5d.	,,	,,
Fluted sheet, 15 oz.	3d.	,,	,,
,, ,, 21 ,,	4d.	,,	,,
⅛ Hartley's Rolled Plate	2d.	,,	,,
3/16 ,, ,, ,,	2½d.	,,	,,
¼ ,, ,, ,,	2¾d.	,,	,,

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	2	6
,, ,, ,, in barrels	,,	0	2	10
,, ,, ,, in drums	,,	0	3	0
Boiled ,, ,, in pipes	,,	0	2	11
,, ,, ,, in barrels	,,	0	3	0
,, ,, ,, in drums	,,	0	3	2
Turpentine, in barrels	,,	0	2	6
,, in drums	,,	0	2	8
Genuine Ground English White Lead	per ton	21	0	0
Red Lead, Dry	,,	20	10	0
Best Linseed Oil Putty	per cwt.	0	8	6
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Elastic Copal Varnish for outside work	0	16	6
Best Elastic Copal Varnish for outside work	1	0	0
Best Elastic Carriage Varnish for outside work	0	16	0
Best Hard Oak Varnish for inside work	0	10	6
Best Extra Hard Church Oak Varnish for inside work	0	10	6
Fine Hard Copal Varnish for inside work	0	16	0
Best Hard Copal Varnish for inside work	1	0	0
Best Hard Carriage Varnish for inside work	0	16	0
Extra Pale Paper Varnish	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
Best French and Brush Polish	0	10	0

TO CORRESPONDENTS.

M. & C. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BROMLEY.—For golf club house, Sundridge Park, Bromley, Kent. Messrs. Swan & Norman, architects, 8, Clifford's-inn, E.C. Quantities by Messrs. C. Stanger & Son, 21, Finsbury-pavement, E.C.:—

	A Building.	B Drainage.	C Flèche.	Total.
F. P. Duthoit	£3,182 0	£185	£62 0	£3,427
Arnaud & Son	3,160 0	181	60 0	3,401
Grubb & Son	3,135 0	192	60 0	3,387
Lewis Evans	3,130 0	180	60 0	3,370
Crossley & Son	3,082 0	172	58 0	3,312
R. Lowe	3,005 17	215	58 3	3,279
T. D. Graty	2,995 0	187	70 0	3,252
Larke & Sons	2,960 0	220	70 0	3,250
H. Chapman	2,998 0	187	60 0	3,245
Perry Bros.	2,908 0	215	54 0	3,177
F. G. Minter*	2,895 10	203	57 10	3,156

CANTERBURY.—For the erection of a detached residence, Whitstable-road, for the Trustees of the Wesleyan Church. Mr. Walter Cozens, architect, Old Dover-road, Canterbury:—

C. H. Smellie, Eclington, Herne Bay £874

CHELMSFORD.—For bank, and manager's house at Chelmsford, for the Capital and Counties Bank, Ltd. Messrs. Clare & Ross, architects, 1, West-street, Finsbury-circus, E.C., and Chelmsford. Quantities by Mr. J. B. H. Low, 97, Cheapside, E.C.:—

Sheffield Bros.	£6,658	E. West	£5,856
F. Johnson	6,100	Smith & Son, Witham‡	5,795
Moss & Co.	5,996		

‡ Amended, and accepted on reduced quantities.

[*See also next page.*]

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DORCHESTER.—For additions to workhouse, for the Guardians. Mr. A. L. T. Tilley, architect, 26, South-street, Dorchester :—

C. E. Slade	£1,040	Watts Bros., Dorchester*	£990

HOVE.—New street works. Mr. H. H. Scott, Borough Surveyor :—

Montgomery-street.

Parsons & Sons, 118, Church-road, Hove* .. £353

Ruskin-road.

W. Whiteman, 59, Clarendon-villas, Hove* £336 17

Kendal-road.

Parsons & Sons, 118, Church-road, Hove* .. £279

ILFORD.—For the erection of school buildings, house, &c., Loxford Hall Estate, for the School Board. Mr. C. J. Dawson, architect, 7, Bank-buildings, Ilford. Quantities by Messrs. Garciner & Theobald, Great Russell-street :—

Dearing & Son	£9,690	Hammond & Son	£8,982
Davis & Leaney	9,583	F. and E. Davey	8,945
Kirk & Randall	9,416	H. J. Carter	8,852
W. Shepherd	9,277	Foster Bros.	8,784
Holliday & Greenwood	9,232	Barker & Co., Ltd.	8,765
Silas Parmenter	9,034	F. Willmott	8,715
Chessum & Sons	8,990	B. E. Nightingale	8,689
		J. Appleby	8,354

ILKESTON.—For the construction of reservoirs, buildings, &c., in connexion with the waterworks which are to provide a new water supply for the Ilkeston and Heanor districts, for the Ilkeston and Heanor Water Board, Ltd. :—

J. F. Burns	£61,392	Moss & Sons	£48,750
Cooke & Co.	57,850	T. Smart, Nottingham*	48,360
Vickers, Ltd.	57,000	Ashley	48,299
Davis & Drake	55,000		
J. F. Price	51,750		

LONDON.—For the foundations of Bermondsey Police Station and Court. Mr. Dixon Butler, architect. Quantities by Messrs. Thurgood, Son, & Chidgey :—

Foster & Dicksee	£5,990	Spencer Santo & Co.	£4,680
Higgs & Hill	5,350	J. Parker	4,590
Ashby & Horner	5,348	Martin Wells & Co.	4,462
Lovatt	5,238	Killby & Gayford	4,420
Lawrance & Sons	5,214	Holloway Bros.	4,395
H. J. Williams	4,997	Clarke & Bracey	3,939
Mowlem & Co.	4,827	Grover & Sons	3,874
Lascelles & Co.	4,750		

LONDON.—For alterations to house, Cressingham-road, Lewisham, for Mr. H. H. C. Ball. Mr. Alfred Roberts, architect, Greenwich, S.E. :—

C. Robson	£325	A. Bentley*	£243
Kennard Bros.	280		

NEW BARNET.—For alterations and enlargement of Church of England Schools, Potter's-road, New Barnet. Mr. F. Child, F.S.I., 65-66, Chancery-lane, W.C., and New Barnet :—

	For completing scheme.	For part to be now carried out.
J. Stewart	£1,126	£845
Voller & Goodfellow	1,075	760
Patman & Sons	925	645
Wells & Son	975	612
J. Porter	860	537

LONDON.—For additions to Glenwood, Westcombe Park, S.E., for Mr. T. E. Scrutton, K.C. Mr. Alfred Roberts, architect, Greenwich, S.E. :—

Kennard Bros.	£1,689	H. Groves	£1,311
W. Mills	1,351	T. D. Leng*	1,250

ONGAR (Essex).—For partial reconstruction and sanitary work at Forest Hall, Ongar. Mr. H. Phelps Drew, architect, 33, King-street, Covent Garden, W.C. :—

J. & C. Bowyer	£338 0 0	Norton, Chelsea*	£329 10 6
Noble	335 0 0		

WALTHAMSTOW.—For the erection of new class-rooms and cloakrooms, and sundry alterations and additions, to the Higham-hill and Forest-road Schools; also boundary wall at rear of Board's offices. Mr. H. Prosser, Architect to the Board, School Board Offices, Walthamstow :—

—	Alterations and Additions, Higham-hill Schools.	Alterations and Additions, Forest-road Schools.	Boundary-wall, Board's Offices.
	£	£	£
Viney & Stone	3,384 0 0	1,287 0 0	70 0 0
Pollard & Brand	3,315 0 0	1,150 0 0	67 0 0
B. E. Nightingale	3,180 0 0	1,100 0 0	57 0 0
Sands, Palmer, & Co.	2,985 6 0	1,052 9 3	51 7 6
Davies & Clayton	2,379 10 0‡	—	47 10 0‡
R. & E. Evans	—	898 0 0‡	65 0 0

‡ Accepted subject to the approval of the Board of Education.

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The Builder.

VOL. LXXXII.—No. 3050 APRIL 26, 1902.

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Cartoon for East Window of Lledrod Parish Church, Aberystwith ..... Designed and Executed by Mr. Silvester Sparrow.
Offices, Moorgate-street, E.C. ..... Mr. W. H. Atkin Berry, A.R.I.B.A., architect.
New Premises, 54, Ludgate Hill ..... Messrs. Young & Hall, architects.
Design for Social Club, Wembley Estate ..... Mr. F. H. Jackson, architect.
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The Report on Truro Cathedral.

In his recent Report to the Building Committee upon the fractures that have developed in the nave piers of Truro Cathedral, Sir Thomas Drew appears to be fully sensible of the delicate nature of his task. To the man of narrow mind and illiberal instincts there is no greater joy than to find fault with the work of others, and it is a pleasure to read Sir Thomas Drew's chivalrous references to the architect of Truro Cathedral. In the forefront of his Report, Sir Thomas expresses his admiration of the late Mr. Pearson as the greatest ecclesiastical architect of his time, and says that he has no adverse criticism for the designer of the piers that failed. While fully sympathising with the generous feelings that evidently prompted these remarks, we are unable to avoid the hard logic of facts. It is perfectly obvious that if no faults had originally existed the piers would not have failed, and the improved form of reconstruction now advocated would not have been necessary. The best of us are liable to error, and those are truly wise who seek knowledge from past mistakes. Therefore, it seems well that careful search should be made for the true causes of the mishap to which we now refer. We are unable to agree with the criticism expressed in the earlier pages of the Report, upon modern constructive science, for the methods now followed are based upon correct appreciation of the proper uses and limitations of stone masonry. It sounds very well to speak of "mobile construction, restrained by countervailing forces, of balance, counterpoise, and thrusts," as exemplified by the buildings of mediæval architects, but such conditions are scarcely consistent with true stability, and must occasion strains that ought not to be caused in a material so brittle as stone. The strength of stone masonry really depends upon the strength of the stone, the size of the blocks, the accuracy of the dressing, and the strength of the mortar, and we are therefore surprised to learn from the report that the cause of disaster should have been attributed to the modern specification as to mortar and bedding, and to the accurate and conscientious manner in which the terms of the specification were observed. No doubt, as the Report says, beds of stone in old work were usually laid in comparatively thick swimming beds of mortar produced by an unscientific mixing of lime and sand by rule-of-thumb methods, while in modern practice bed-joints are of properly-made mortar no more than ¼ in. thick. But we must remember that in former times stones were more roughly dressed, and so required more mortar to keep projecting points apart. The stones at Truro were truly wrought, and when worked into their seats the bed-joints were little more than a bare ¼ in. thick of superior mortar. It appears to be considered that this treatment involved a risk of undistributed pressure upon the lowest bed. Of course, there are always risks in this world, but why inequality of pressure should be suggested by accurately-levelled and truly-faced work, we cannot quite understand. As for the thickness of the beds, ⅛ in. is considered to be sufficient by competent authorities, when stone has been faced almost to a plane, for pressure is then distributed nearly uniformly, and the mortar serves chiefly to transmit pressure to small depressions. In fact, if the joints were very smoothly finished, mortar would be, practically, unnecessary for the distribution of pressure; but such extreme smoothness would create a risk of displacement by the sliding of one stone on another. Again, if the cushion of mortar between two blocks of stone were of insufficient strength, it might be squeezed out laterally, so tending to cause failure of the stone by tension. For these reasons, we are unable to agree with the first hypothesis in the Report.

We now come to a proposition which is entirely reasonable, and in complete accordance with modern practice. After pointing out that the bed under the plinth of each pier is practically a damp-course of asphalte ½ in. thick, between the irregular surface of the foundation pier and the smooth under-face of the plinth course. The Report says that asphalte was an unfortunate insertion as the bedding joint on which stress was concentrated. The accuracy of this conclusion will be abundantly evident after inspection of fig. 1., which represents the sections of the piers as built. The following undesirable features will also be observed, to which attention is not specially directed in the report:—(1) the irregular composition of the rubble masonry is by no means suitable for the uniform reception of pressure; (2) if the section given in the Report may be accepted as correct, the stones do not break joint properly—notably in the centre of the foundation pier—and no headers are evident; and (3) instead of using one large stone for the base of the column, two thin stones, measuring 11⅞ in. and 9⅞ in. respectively, are employed for the plinth and torus. Adding to these points the unsuitable nature of a plastic substance like asphalte for the equalisation of pressure, there was every reason for anticipating fracture of the foundation-bed, followed by failure of the base stones due to tension. Further, as we gather from the Report that moisture exists in the subsoil, it is not impossible that failure may have been influenced to some extent by subsidence tending to rupture the foundation at the weak point mentioned above. Next we observe a suggestion that the building contractor—whose conscientious work was previously held to be partly responsible for the disaster—may possibly have further contributed to failure by "a certain modern energy and impatience under a certain modern contract" by imposing weights rather too soon on the substructure. The complimentary manner in which these remarks are made in the Report does every credit to the author, but we fancy the builder

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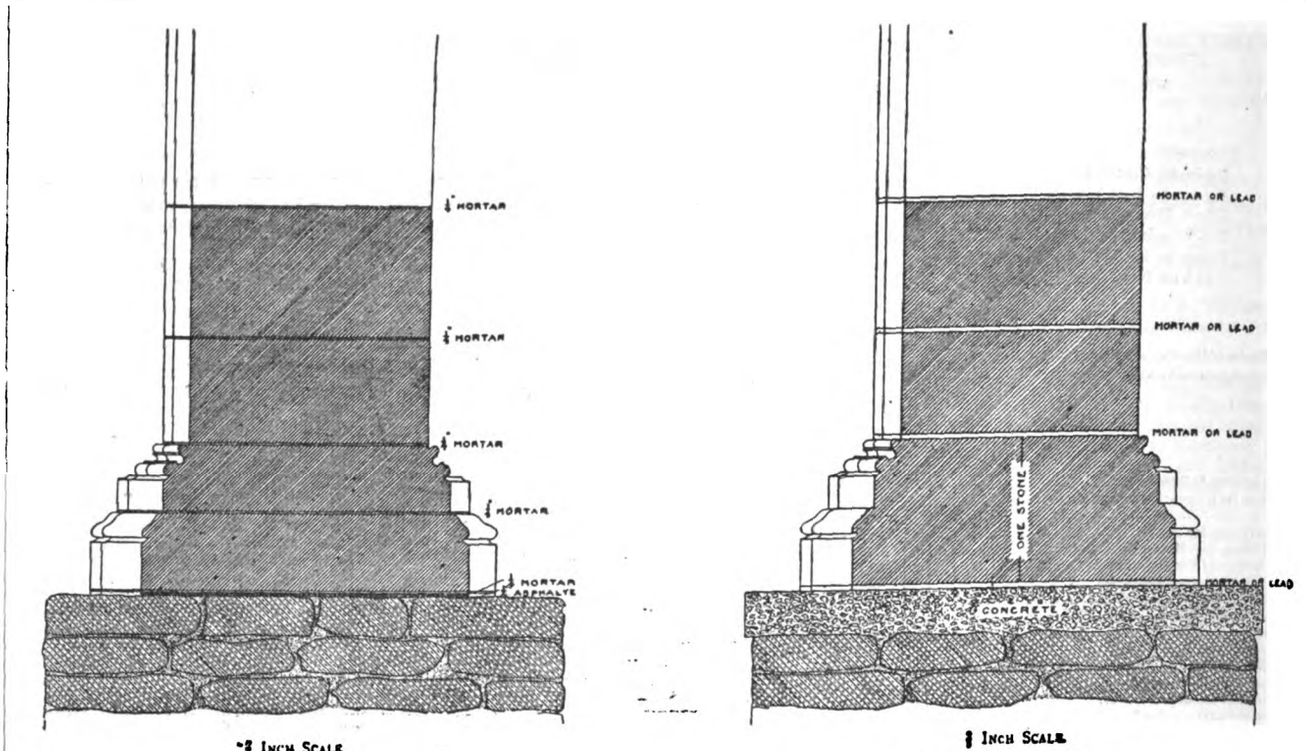

As built. As proposed to be rebuilt.

Section of Pier, Truro Cathedral.

would be quite willing to forego praise of the kind under the circumstances. Finally, it is said that pointing up the bed joints under the weak spur-bases, as the work proceeded, manifestly contributed to fractures; a theory that is certainly feasible.

As to the measures that ought to be taken for reparation of the injury, we are in accord with Sir Thomas on almost every point. He proposes that fractured stones should be replaced, and that the bases should consist of one stone each, 21-in. deep. The rubble foundation, he thinks, should be lowered to permit the formation of a concrete cope as a seat for the new base stone, and to act as a damp-course in place of the asphalte removed. An inspection of fig. 2 will enable our readers to gather the effect of these alterations, but it will be noticed that lead is suggested as an alternative to mortar for the beds of the courses. This option is one which, we trust, will not be accepted, for the same reason that dictates the rejection of asphalte. As the strength of the Corsham Down Bath stone used in the construction of Truro Cathedral has been questioned, it is satisfactory to note that the direct compressive stress per square foot in the piers is well within the safe limit, and there seems no reason for doubting the judgment of Mr. Pearson in selecting this material.

Generally, it is reassuring to learn that the magnitude of the fractures should not be over-rated, and that they need cause no anxiety as to the stability of the cathedral.

Since the above remarks were written, we have learned that the Cathedral Committee do not propose to take any immediate steps, but will wait to see, we suppose, whether any further movement takes place. We think they would be wiser to carry out Sir Thomas Drew's suggestions without delay. If anything worse develops a rather heavy responsibility will rest on them.

ARCHITECTURE AT THE GLASGOW INSTITUTE OF FINE ARTS.

WHAT for some years has been a distinguishing feature in these exhibitions, the presence of photographs, is more marked than ever; they form a full quarter of the display. In the illustrations of actual work, nothing can be better, in interiors particularly; beautiful results in light and shade are got by means of the camera; but works only projected must, of course, be illustrated otherwise.

A general glance through the drawings shows that pen and ink has the preference; a few wash drawings, a few in colour, and fewest of all in geometric elevation; and there are no models, as in the Royal Scottish Academy, which, for these four years back, has welcomed them while drawing the line at photographs. Colour one might expect to find in greater favour, as facilities are offered for printed reproductions well and inexpensively. As to the photographs, it might be interesting to compare them with drawings made when the buildings existed only in intention, to see what force there is in the general contention that the perspective draughtsman invariably flatters. Still, even if over-partial, his representation is better than none; and of important buildings projected, it is only fair to the community that a notion should be given of what is to be. It is a pity this obligation is not more generally acknowledged, for it is too late for criticism when the erections have reached the photographic stage. In the exhibition are instances of rejected designs shown, while the accepted ones are absent; this is the case with an important City church and with the Technical College; perhaps, more important still, the railway bridges that are to span the busiest thoroughfare of Argyle-street and the river Clyde. These, it is known, will effect a great change on what exists, but what is proposed is kept from the citizens.

In extent, the exhibits only number some forty or so; a less number than usual, and with nothing of the first importance. A conspicuous want is the customary contribution from English architects; apparently their support of the recent international exhibition has exhausted the supply. In the present show, the ecclesiastical works are, curiously enough, all local—with one exception—and all are Gothic; revived English perpendicular is the current vogue.

Of actual work, "Newlands" (527), by Mr. H. E. Clifford, is the most important; a very effective treatment of a three-aisled church, with transepts but no spire; existing halls had to be incorporated, and this has been well managed. "St. Margaret's" (544) is a small mission church with a square tower, almost Dutch-like in its tiled roof of projecting eaves, but the architectural feature is not gratuitous, for as it is of the same width as the main aisle its area is thrown into the church, and overhead is a gallery. As with all Mr. Rowan's work, there is studied design in every detail, economy of means and material, but no stinting of care. Another small church (545), by Mr. P. M. Chalmers, is inexpensively but adequately treated in early Gothic. The interior of a new chancel (542), to increase the accommodation of an uninteresting fabric, does not give great scope, and Mr. Wm. F. McGibbon has not done more than make the blend passable. The outside example referred to is the "Church of the Good Shepherd" (557), by Mr. Lorimer—characteristically Scottish in treatment (Late Decorated), and the detail both of stone and woodwork is charming. The design for St. Columba's Church (570), by Mr. Balfour, shows a hackneyed arrangement of gable and spire, and the selected design is understood to be on just the same lines; these were, indeed, laid down by the Building Committee, and this is the misfortune, for in the immediate vicinity are two Gothic spires of just this model, while

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across the way is Greek Thomson's Campanile. That has an advantage in being uphill; so a comparison can hardly be avoided, and it will be entirely to the detriment of the new comer.

A rejected design for the New Technical College, by Messrs. Watson & Mitchell (556), is a dignified and appropriate composition. The accepted one is not here shown, but remembrance of it seen when the half-dozen sets were on view is not favourable; probably it possessed superior merits on the plan, but there is no reason why its usefulness should not be allied with beauty; the site deserves it. The design for the Royal Infirmary, by Mr. H. E. Clifford (527), is on view, but not Mr. Miller's, selected by the managers in a manner that gained them some notoriety. The excellence of its Classic detail need not be discussed when the architectural and sanitary objections to it are only less than that applying to Mr. Miller's, in so far as its bulk is less.

"Business premises, West Nile-street" (553), by Messrs. Burnet, Boston & Carruthers, have a Columnar Order extending through a couple of stories, with oriel windows in each bay, of rather stately manner, and not unlike some other works in the city by the same firm. Solf Hill School (531), by Mr. A. N. Paterson, shown in a wash drawing, is simple and appropriate; not very much can be done with Glasgow's public schools, the plan is so stereotyped, but it is to the credit of the Board that, with conditions that to many would justify an official appointment, independent architects are employed. Other business premises (537) and (555) fail, the former because of commonplace, the latter because of over-originality, the eccentricity extending to the drawing. "The District Offices, Hamilton" (552), by Mr. Cullen, are in a Classic style, as necessitated by adjoining public buildings, but with many variants in detail that give personal interest. A block of workmen's tenements (551), by Mr. Jas. K. Hunter, Ayr, shows the most made of roughcast and a few stone dressings; it is encouraging to see such inexpensive work showing interesting and capable design. Messrs. Niven & Wigglesworth, of London, have the "Headquarters of the Sailors' Society" (538), in brick and stone, a reminiscence of a Tudor gateway giving suggestion of a public institution without pomposity. A fine photograph is shown of the dome and colonnade of the late Exhibition; while a worthy representation of Mr. Miller's skill, it is surely not the only example that might have been shown. No. 565, by Mr. Hill, is the Saracenic pavilion, its exterior better thought-out than the interior, possibly to avoid competition with the carpets it sheltered. A sitting-room, by Mr. Jas. Salmon, is shown in photograph, and a street frontage (568), by Mr. Gillespie, of the same firm, in a wilfully rough sketch, are about the only examples of the "new art," and not so extreme as some; happily, there are signs that the craze is passing.

In domestic work there is a frame of photographs (533) of a terrace house remodelled by Mr. John James Burnet, A.R.S.A. The materials are of the finest, and lavishly employed, but more praiseworthy is the wealth of artistic skill enlisted. Some of the best artists and craftsmen of the day are here represented. A billiard room (549), by Mr. John A. Campbell, comes little short. The same architect has another photograph (550), interior of a cottage home for girls, the gift of a rich man, and so expensively, but not inappropriately, managed; it has the appearance of a living room, the character that is affected in many drawing-rooms nowadays.

"Briglands" and "Earlshall" (557) are studies in Scottish Renaissance, by Mr. Lorimer, of the greatest interest. Three houses by Mr. Morris, of Ayr (558), one in Northampton, are very good; drawn in brown ink and geometrically, with plans appended. A very pretty pen-and-ink drawing of a house in Kent, by Messrs. Niven & Wigglesworth, and a house at Accrington by Mr. T. L. Watson, are the only English specimens shown.

Of a few architectural drawings pure and simple, Mr. Mitchell's "Salzburg Castle" is the best, in vivid colour and decorative manner. Coloured drawings of stained glass give but little assurance of what the actual work would be, but, so far as drawing and colour go, the frame by Messrs. Guthrie & Wells is the one we prefer. There is a case of simple jewellery, by Mr. A. J. Gaskin, stones set in silver twisted wire, and beaten work principally; the former are good, without extravagance.

NOTES.

The Late M. Dalou.

By the death of M. Dalou the world loses one of the greatest and most original sculptors of the day. The peculiar power of Dalou lay perhaps in this, that with a great feeling for decorative line and effect he combined an unusual energy and intensity in the expression of human passion and emotion. Finely modelled as his work always was, there is no cold classicism about it; it is full of the spirit of modern life; as a French correspondent who knew both him and his work well, remarks of him, "il unissait à la fougue de son maître Carpeaux les qualités décoratives des sculpteurs du XVIIme siècle." Occasionally, perhaps, he allowed his desire for forcible expression to carry him into compositions of too violent action to be quite suitable for sculpture, as in his monument in the Luxembourg gardens, "Time Bringing Fame to Delacroix," where the figure of Time rushes up to the terminal bust of the painter, carrying in his arms a nude female representing Fame. There is just a suspicion of the ludicrous in this group, or at least in this way of presenting the idea; but what energy and vivacity there is is in its execution; how forcibly it contrasts with the average platitudes of monumental erections. His great work, the "Triumph of the Republic," is in itself worth going to Paris to see; few of the ordinary run of Paris sight-seers are acquainted with it, as it stands on a site at the extreme eastern quarter of the city (at the end of the Faubourg St. Antoine); but those who will go out of their way to visit it will find themselves well repaid.

The Liverpool Cathedral Competition.

We are officially informed that the Liverpool Cathedral Committee have requested Mr. G. F. Bodley and Mr. Norman Shaw to act as their architectural advisers in the preliminary selection of architects for the final competition for Liverpool Cathedral, and in the ultimate selection of a design for the cathedral. The Committee "feel sure that this intimation will give great satisfaction to the profession, and confidence to the public at large." We rather doubt it. If the idea was to select two assessors representing the Gothic and the Classic school respectively, no doubt Mr. Bodley is an ideal representative of the school of modern Gothic church architecture; but Mr. Norman Shaw has had little or nothing to do with church architecture, and we can hardly imagine that competitors in an important church competition would have thought of him as a judge by whose verdict they were willing to stand or fall.

The View from Richmond Hill.

It is most satisfactory that the question of the view from Richmond Hill, to which we have more than once referred, should have been settled in a manner desirable in the public interests and in that of Lord Dysart, the owner of the land over which the view extends. Not only is the view effectually preserved, but a large amount of open space is now permanently secured for the public. Of the Petersham meadows 32 acres are to be vested in the Corporation of Richmond, which, of course, will be retained as an open space for the public enjoyment; 125 acres more, over which there are common rights, is to be vested in the Corporation of Ham; and, out of a total of 314 acres in the Dysart estate, 235 are to become public property. These and other particulars were settled by a select committee of the House of Commons last week, a Bill having been introduced for this purpose by Lord Dysart, with the concurrence of the parties interested and of the Commons Preservation Society. This result shows what may be done by amicable negotiations between a reasonable private owner and business-like public authorities, and we hope that this Richmond view question will in its result be followed by other instances.

The Supply of Electric Light.

An important decision with regard to the supply of electric light is reported in the current number of the "Law Reports" in the case of "Husey *v.* London Electric Supply Corporation." The result of that case is that an electric supply company may make any terms it likes. Under Section 19 of the Electric Lighting Act, 1882, no person within the area supplied with electric current by an electric lighting company is entitled to a supply of current by the company unless and until he has entered into a contract with the company for the purpose. In the case in question the electric supply company refused to make a fresh contract until a new proprietor of the premises which were previously lighted paid the amounts due by the former proprietor. As a matter of fact, the former proprietor was a hotel company, and the new proprietor a receiver for debenture-holders; but this makes no difference in the principle of the law. The Court, in giving judgment, said that if the company had a legal right to cut off the electric current, the Court has no jurisdiction to interfere by considering what their motive for so doing may be. It is therefore very easy to see that a good many innocent people may have to pay the debts of other people which have been incurred in respect of electric light, if they wish premises to be continued with the supply in the same manner. We cannot

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see any reason why the electric supply companies should have more power than an ordinary tradesman, or why the supplier of light should be in a better position than a butcher or a baker.

The "James Forrest" Lecture.

ON the 23rd inst. the tenth "James Forrest" lecture was delivered at the Institution of Civil Engineers by Sir William Roberts-Austen. The title of the lecture was "On Metallurgy in its Relations to Engineering." Commencing with a short historical narrative of the slow progress in the use of metal for constructive purposes by engineers up to the end of the eighteenth century, Sir William said it was reserved for the nineteenth century to witness the triumph of metallurgy as an aid in engineering construction. The history of iron as a constructive material during the nineteenth century may, said the lecturer, be divided into three periods, viz., (1) the earliest portion of the century, when cast and wrought iron came into extensive use; (2) a later period when steel largely replaced cast and wrought iron; and (3) the closing years of the century which witnessed the admixture of other metals, often in very small proportion, to increase the strength of the iron. Sir William demonstrated that mixtures of salts or of metals when passing from the liquid to the solid state undergo solidification in two stages. The mixture of metals first falls to a temperature at which it appears to become solid, but it nevertheless contains a certain proportion of the mixture in a liquid condition until at a lower temperature the second stage is reached, and the whole mass becomes solid. The portion of the mixture which remains liquid until the lower solidifying or freezing point is reached, is termed an "entectic" mixture; and the lecturer laid great stress upon the importance of the influence exerted by entectic mixtures in iron upon the physical properties and commercial value of the resultant metal. In conclusion, some interesting microscopical photographs, exhibiting the remarkable changes produced in the molecular structure of solidified metal by changes in the rate of cooling it from the molten condition, were shown upon the lantern screen. The lecture was one of the most admirable of the many noteworthy discourses which have been delivered in Great George-street.

West Australian Timber.

IN the Colonial Exhibition at the Royal Exchange, London, some interesting specimens of the hard woods of Western Australia may be seen. Some elaborate furniture constructed of Jarrah wood shows the rich colour of this timber, and demonstrates that it is capable of taking a beautiful polish. The parquetry and inlaid work is admirable. As Jarrah is cheaper than teak, and has been proved to be good fire-resisting timber, it will probably become extensively employed in London for the construction of the doors at least two inches in thickness required in many situations by the London County Council. Among other exhibits is a collection of wood blocks which have been taken up from roads after being in use for several years. These are not of much value as evidence of the durability of the blocks without more precise details of the conditions to which they were subjected. The value of Jarrah and Karri blocks for wood paving is, however, now too well known to require further demonstration. Another exhibit which attracted much attention is a Jarrah plank, which after being used as a pile, and submerged for over twenty years, has taken a fine polish, and appears as good as a new piece of well-seasoned timber. It is stated that Western Australia contains eight million acres of Jarrah forest, while two million acres are covered with Karri, another useful hard wood. With proper conservation and an intelligent system of replanting, the timber industry of Western Australia should form an important and permanent source of income to the inhabitants of that State.

Marconi's Experiments.

LORD RAYLEIGH, in a course of lectures which he recently gave at the Royal Institution, pointed out the apparently insuperable difficulties which stood in the way of sending wireless signals across the Atlantic owing to the curvature of the earth. In the *Electrical World* of New York Dr. A. E. Kennelly points out that perhaps this signalling round the world may not be so difficult after all. It is known that very highly rarified air is a conductor for electrical currents, and hence at a distance of fifty miles above the earth's surface we have what is practically a sheet of conducting material. The Hertzian waves sent out by Marconi's transmitter travel in straight lines like light waves, and, just as light waves are reflected from a polished surface, so they are reflected from the rarefied strata of air, and hence they spread over the earth's surface in a layer approximately fifty miles thick. This explanation of Dr. Kennelly's seems to us quite satisfactory, and if it is found that the attenuation of the signal varies inversely as the distance instead of inversely as the square of the distance, then we may consider that the existence of an upper reflecting surface for these waves is experimentally verified.

Testing Tramway Motors.

THE paper by Mr. M. B. Field on "The Testing of Tramway Motors" which was recently read to the Glasgow local section of the Institution of Electrical Engineers is well worthy of study by tramway engineers. The ordinary rough-and-ready methods of testing motors by seeing how they work when placed on a car lead often to most erroneous results. Little variations in the manipulation of the handle of the controller by the motorman make great differences in the energy consumption and on the average speed of the car, and so it is almost impossible to make satisfactory comparative tests by this method. It is necessary to supplement these experiments in the testing-room, and the testing frame and method of calculation devised by Mr. Field seem well suited for this purpose. If all tramway generating stations tested their motors in one of these frames it would soon lead to uniformity of rating by different manufacturers. At present one manfacturer will rate a motor as 40 h.-p., because it is capable of giving out this power for a few minutes whilst another would only rate it as 20 h.-p. because this is the maximum horse-power that it can safely give out for an hour without damaging the insulation by overheating it. It is important also in specifying the efficiency of a tramway motor to state the temperature of the coils at which it is to have this efficiency. The resistance of the coils is often 30 per cent. more at the end of the hour's run than it was at the beginning and this diminishes the efficiency by 3 per cent. Mr. Field's method of testing motors is a simplified form of Hopkinson's test; one of the motors takes energy from the line, and drives the other motor as a generator whose output can be varied. He mentions that when testing motors by running them at a high speed and then short-circuiting them, they not only come rapidly to rest, but actually make a few revolutions in the reverse direction. This phenomenon, however, is one well known to electricians, and has been described before. In the appendix are printed many carefully compiled tables, and curves are drawn which show at a glance the efficiencies, speeds, tractive efforts, losses, &c., of a tramway motor. These will be valuable, as they show that considerable economies can be effected by a proper management of the handle of the controller.

Roads in California.

THE "good roads agitation," which was commenced in the United States ten years or so back, hardly took root in California until the year 1895, when a bureau of highways was created for the period of two years. During the early part of the past century, the prosperity succeeding the Revolution demanded extended means of communication. Ordinary roads were supplemented by toll-roads, frequently built of planks, but generally of earth and gravel. The exaction of tolls became burdensome, and so restricted development that the acquisition of such highways grew to be a public necessity. Then followed a period in which the desirability of ready transportation was so fully recognised that the United States Congress, and almost all the state and county governments, occupied themselves in the study and practical application of the art of road-making. Soon after 1835, when road-building, encouraged by governing bodies and entrusted to skilled engineers, became a science, the development of the railway system diverted attention to the new mode of transportation. Thenceforth for generations the making of roads was forgotten to such an extent that people were born and reared who had never seen an ordinary road. As an American writer has recently said, "They have learned to speak of streaks of dust or mud, as the case may be, as roads—have actually learned to regard them as such, and solemnly dedicate the same to public use, as if they really were well-located, graded, drained, and thoroughly metalled highways." Under these conditions California was settled, and her road system was but a makeshift at the best. In 1895 the State had reached the limit of development possible with bad roads, and the times were fully ripe for the bureau of highways. After two years of consideration and enquiry, the commissioners of that body recommended (1) the classification of roads into state highways, county thoroughfares and district roads; (2) an Act empowering the state to acquire highways of the first class; (3) an Act regulating the width of tires; (4) an Act creating a Department of Highways; and (5) reduction of taxation. Of these proposed Acts only one became a law (to take effect from 1900), but it was rendered inoperative

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at an extra session in 1899-1900 in consequence of opposition from makers of wagons. Of the other proposed Acts, the first was disapproved by the executive, the second was vetoed by the Governor, the fourth was amended for partisan purposes so as to give patronage in state elections, and the fifth was the actual cause of increased instead of reduced taxation. This seems to be a fairly disheartening record, but it is not all. An Act known as the Clark-road Law was passed as an urgent necessity, but was subsequently declared illegal by the supreme court; another measure for the improvement of roads in the Yosemite Valley district was found to have a defective title, and so failed to receive the signature of the Governor; and yet another road Act, passed by the Legislature in 1897, was declared by the courts to be invalid. A Department of Highways was next created to continue the work provided for by law, but through lack of funds was debarred from executing any important work. From the above recital it seems that law-making has been even less understood in California than road-building.

Seven Dials Mission House, West-street, St. Giles.

THE new mission buildings opened last week have been erected after the plans and designs of Mr. C. W. Reeves. They occupy the site of the old vestry-house, which had been "condemned" by the authorities, adjoining the Episcopal chapel which formed a scene of John Wesley's labours during the period 1743-1790, as is testified by entries in his diary. The freehold property, covering an area of 4,120 square feet, was bought for 4,500*l.* in December, 1887, for the purposes of the local mission, removed thither from Short's Gardens. The chapel (originally known as La Pyramide de la Tremblade) and the vestry-house were erected at the end of the seventeenth century for a congregation of Huguenots who had migrated to Newport Market from Weld House, which until 1695 stood on the east side of Great Wild-street. By her will (1726) Mrs. Elizabeth Palmer left a sum of 500*l.* to be invested in real property, and directed that the rents so derived should be distributed yearly amongst twelve poor widows of St. Clement Danes parish. The trustees applied the bequest to the purchase of the chapel and the vestry-house. In 1800 the chapel was added to the establishment, and during some years from 1830 services were conducted there in the Irish language. Wesley's portable pulpit for open-air use, and a water-coloured drawing of the old house, have been preserved as relics. The first floor of the vestry-house contained an apartment of which the three windows opened into the chapel at its north-western end; the apartment, known as the "Nicodemus room," was frequented by those persons who attended the Methodist services whilst desirous that their presence there should not become known.

Turner's House at Twickenham.

WE learn that this house will be offered for sale at auction before the end of the current month. When in the market five years ago it was purchased, in September, 1897, for, we find, 1,202*l.*, the rental being 65*l.* per annum. Known as Sandycombe Lodge—though Turner himself named it Solus Lodge—and standing near St. Margaret's railway station, it was built, it is believed, for Turner, and after his own designs, for occupation by him and his father when he quitted his riverside house at West-end, Upper Mall, Chiswick. The memoir by Mr. R. N. Wornum, in his "Turner Gallery" (1861) states that Turner bought the ground at Twickenham in 1807, and sold the house and garden in 1827; in the meanwhile he had built, in 1812, the house and picture gallery in Queen Anne-street West, which was pulled down twenty-two years ago, the site, No. 23, being taken for the offices of the Lord Howard de Walden (formerly the Portland) estate, St. Marylebone. Sandycombe Lodge, of which we published an illustration in our number of September 18, 1897, comprises four bedrooms, two day-rooms, and a library, and, with the exception of a bathroom since added, remains as it was in the painter's day; but the view towards the river, whereon he passed much of his time studying and sketching, is now shut in with modern villas.

Mr. Briton Riviere's Studies.

AT the gallery of the Society of Fine Arts are to be seen a number of sketches and studies of animals by Mr. Briton Riviere, representing the larger part of a collection covering more than thirty years. Many of them are studies for animals in special and well-known pictures; others are studies of various animals that came from time to time under the artist's observation, including also two sheets of red-pencil sketches of animals from memory, which are among the most interesting things in the collection, and show how familiar the artist has become with the movement and character of animals. Among the larger studies the finest are those of lions, which appear in a number of attitudes and circumstances, always treated with the greatest force and vigour. Among the finest are the "Lions going to Drink" (16), dark forms walking stealthily through the twilight; the lioness studied for "Daniel's Answer to the King" (18); the lion in "The King's Libation" (51); a very powerful foreshortened drawing of a leopard for the picture of "Aphrodite" (129); and the beautiful finished study of a lioness, No. 155. Dogs are the next favourites after lions, and of them there are many studies. These studies of animals made from the life are in some respects even more interesting than finished pictures, and we were very much surprised to find that the private view of them attracted such a small number of visitors. We have seen the gallery of the Society crowded, even to inconvenience, at exhibitions of far less interest than this one.

"MAGAZINES AND REVIEWS."—Mr. J. G. Leigh, the writer of the three articles on the Isthmian Canal question referred to under the above heading in our issue of the 12th inst., complains that we have misrepresented him in saying that they were "practically the same articles." We admit that the expression was rather too sweeping; the articles differ in literary arrangement and form, though in the main they give much the same information and use the same arguments. The point of our remark, however, was merely this: that editors as a rule (as Mr. Leigh will find if he makes inquiry) strongly object to a contributor on any special subject writing simultaneously on the same subject in another magazine. An editor likes his magazine to have its own individuality, and not to see its subjects and contributors reflected, as it were, in the pages of another magazine. That is the whole meaning of our query; it referred simply to a question of literary or journalistic etiquette, and was not meant as the slightest imputation on the writer. Mr. Leigh, however, now informs us that "the editors of the respective magazines were made aware that articles by me upon the subject of the Isthmian Canal would appear in other periodicals." In that case, of course, our criticism would fall to the ground, and we regret having made it.

THE GUILDHALL EXHIBITION.

THE loan collection of pictures at the Guildhall, which is opened this week, consists this year of a selection of works by "English and French painters of the eighteenth century." As far as the French pictures are concerned this is not the most interesting period, and some of the few great names of the century—Watteau for instance, are not represented at their best. On the other hand, the exhibition is the occasion of bringing before the public some French painters whose works, though familiar to students of art history, are not popularly known.

The large room is devoted entirely, except the small gallery, to the larger pictures of the French school. The painter best represented is Boucher, of whose superficial but brilliant art there are two or three large examples, of which the finest is the "Fortune Teller" (39), a work very striking in composition and effective in colour in a hard mechanical way; that sort of colouring which seems addressed to the optics rather than to the intellect. Nattier, a less powerful painter of the same school, whose name has been a good deal revived lately by writers on art, is represented by some works which probably show him at his best; they are good solid painting, so to speak, but his plump and rounded ladies are utterly devoid of sentiment or of flesh texture; they are like paintings on ivory magnified; in the portrait group of "The Comtesse de Neubourg and her Daughter" (32) the young girl's face is exquisitely pretty, in spite of the hard character of the painting. A large portrait group by a less-known painter of the same school, François Drouais, called "A Family Group" (18), is perhaps the finest example of this type of picture. It represents a married pair and their little daughter, grouped with an admirable feeling for line in composition, with a great deal of expressive character in the heads, and a less hard texture than is to be found in Boucher and Nattier. It is, no doubt, somewhat prosaic in comparison with a portrait group of Reynolds or Gainsborough; the painter does not aim at anything beyond realism; but he achieves that thoroughly, along with an elevation of style which cannot be denied.

As already observed, the Watteau pictures are not very remarkable. There are several examples of the work of his pupil and close imitator, Pater, but the best specimen of Pater is to be found in Gallery IV., the "Plaisir Champêtre" (136), a picture which in fact might almost be taken for a Watteau. Among the more notable paintings in the large gallery two portraits of ladies claim notice, that of Mme. Roland, by Mme. Le Brun, a fine and effective portrait of a lady in a blue and white striped satin gown playing the harp; and that of Mme. Lambert de Thorigny, by Largillière, a portrait with a kind of *bravura* of rich costume about it which recalls both Vandyck and the artist's modern successor in French fashionable portraiture, M. Carolus-Duran.

It is when we come to the "Foire de St. Cloud" (28), by Fragonard, however, that we are suddenly brought up by the contrast between a painter of genius and men of mere talent, like the Bouchers and Nattiers and their school. This is a truly wonderful little picture, and quite the most remarkable thing in the large room. It shows a crowded fair held in a golden sunlight beneath masses of trees, the whole pervaded with a diffused glow, as if all the dust of the fair were making a kind of rainbow effect in the hot sunlight. As an example of the poetic treatment of what might have been an ordinary *fête champêtre* subject, it is a work quite exceptional in character. Even Fragonard's smaller and less interesting picture on the same wall, "Le Baiser Gagné" (23), though in a way rather vulgar (as Fragonard sometimes was), is marked out from the Boucher school by the genuine passion depicted on the countenance of the man, an intensity of expression to be found in no other picture in the room.

When we come into Gallery II., devoted to the small collection of English pictures, what a change we find again from the prevalent superficiality of expression and hardness of colouring of the larger French pictures. Here again is genius, not mere talent; genius inventive in respect of colour and treatment. English painting was far ahead of French at that time; art with Reynolds and Gainsborough was art, and not a plaything for a careless

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aristocracy. Among the pictures here are Gainsborough's beautiful and pathetic "Cottage Girl" (77), with quite a history in her face; his sumptuous portrait of "Lady Bate Dudley" (80), with a rather plain face which has no history in it; and Reynolds's "Countess of Temple and her Son" (86), and his "Countess of Tyrconnell" and "Mrs. C. J. Fox" (58 and 59). There are some fine examples of Romney, especially his "Lady Hamilton" (79) in a white dress and tall straw hat, and his joyous group of "The Stafford Children" (57). But among the most interesting things are two examples of that now little-remembered portrait painter, Hoppner; "Mrs. Pearson at the Age of Eighteen" (78), a half-length portrait in a beautifully balanced and complete style, and "Edward Fifth Earl of Darnley" (84), a portrait of a little boy in a dark dress with a white collar, which is a perfectly masterly piece of colour and style in portraiture; even the painter of "The Blue Boy" could hardly have surpassed it. Among the smaller pictures some little landscapes by George Morland are not worth much except as curiosities; there is a small but powerful landscape by J. C. Ibbetson; and several good ones by Gainsborough. It is rather curious to find, in the gallery at the end of the large room, Gainsborough's fine landscape (50) in which the distance and middle distance so strongly recall the manner of Claude; and then to find, as the first thing in Gallery II., a "Landscape and Cattle" by Gainsborough (52) which is as decidedly a reminiscence of Cuyp.

It is in Gallery III. that we have the apotheosis, as one may say, of Fragonard, whose series of paintings and decorative panels, under the general title "La Vierge et l'Amour," constitute perhaps the most remarkable section of the exhibition. They consist of five scenes which make a little history of the love affair of two young people, the last unhappily exhibiting only one of the couple as "Abandonée." These are half-decorative pictures, the idyll being carried on amid a setting of rather scenic foliage and flowers; the remarkable thing about them is that, while the two figures are clad in that conventional mock shepherd and shepherdess costume which fits so exactly with the artificial tone of the French poetry of the time, their faces and attitudes are instinct with genuine feeling. It is "the modish Cupid of the day" with a heart put into him. Look at the earnest expression of the lover who runs in with a rose in the first scene, and the bright face of the girl who starts away with an alarm which is half pretence; and look, again, at the countenances and attitude of the two where in the third scene, "Les Souvenirs," they read over again together one of their old love-letters; in spite of the artificial character of the scenery and dresses the expression is that of the very romance of love. There is something curiously piquant in this combination of artificial circumstance and real passion; it is unlike anything else one remembers to have seen in painting. The "Abandonnée" scene is obviously not finished as regards colour; we do not agree with the catalogue quotation that "it is absolutely complete as it is;" it is pervaded by a yellowish tone which is obviously a ground for something else, and it does not look satisfactory except as regards expression. The narrow upright panels of floral decoration which were intended to frame the principal subjects are very good bits of decoration; the panels of symbolical Cupids are not so good; the Cupids are flabby in character and disagreeable in colour. But the pictures which tell the main story are of quite exceptional beauty and interest.

The smaller French pictures in Gallery IV. are of unequal interest; they include some small but very pretty Watteaus, especially "L'Union Paisible" (122); a striking portrait head of Robespierre by Greuze (107); two or three specimens of Chardin's still-life subjects; a small beautifully painted nude by Boucher, "L'Attention Dangereuse" (125), and a very pretty picture by Trinquesse, "Jeune Femme Assise dans un Parc" (142). But the gem of this part of the collection is the exquisite little picture called here "The Artist's Model" (105: we doubt if this was the original title), by Boilly. This is a perfect little masterpiece of finish in figures and surroundings combined with perfect harmony of colour; it seems to belong to the school of Meissonier rather than to the eighteenth century. The "model" is a small plaster statuette, which forms the high light in the picture, but without the least crudity of white about it. This is one of the most perfect works of its class that we have ever seen, and one would rather possess it than, perhaps, all the other works in this room.

Those who are interested in art, whether in the historic or in the purely artistic sense, ought to feel much indebted to the Corporation of the City of London for having collected such an interesting and instructive exhibition.

BATTERSEA WORKING-CLASS HOUSES COMPETITION.

THE interesting collection of drawings now on view, as announced in our last week's issue, at the Battersea Municipal Buildings, Lavender Hill, showing fifty-eight attempts at solving the crucial problem of houses for the working classes, is well worthy of study, and full of hints for the economical and yet sufficient provision for working-class dwellings. The question is pre-eminently dependent for satisfactory solution on financial possibilities, and the consideration of such an exhibition of drawings as are now on view should afford proof that, with the present cost of building, the provision of decent houses, soundly built and healthily arranged, is possible only to public bodies, who are able to raise the necessary capital at a small rate of interest, or to philanthropists who do not expect the return for which an ordinary investor or speculator would look. The designs now shown also prove that, given a site of moderate cost and reasonably inexpensive management, it is possible for municipal bodies to house the working classes in a decent manner and at rents which the occupants are at present accustomed to pay for inferior accommodation, without the necessity of making good deficiencies from the rates.

As we noticed last week, the Battersea Borough Council invited designs for five types of house, and, as might have been expected, the designs by various authors are more or less successful in varying types. The committee of the Council indicated in their decision that the first premiated design, No. 37, by Messrs. G. T. Smith & Weald, excelled in its plans of the cottage and four-room tenements; the second design, No. 12, by Mr. J. Sydney Bucklesby, in the plan of three-room tenements; and the third design, No. 21, by Mr. H. Bertram Tarrant, in the plan of four-room tenements.

In the first premiated design the plan of the cottage, or five-roomed house of two stories, shows on the ground floor a parlour in front, of 112 super. ft., a living-room at the back, of 134 super. ft., and a scullery with copper, gas stove, sink, and shelf. On the first floor are two bedrooms of 110 super. ft. each, and one of 118 super. ft. The three-roomed tenements in two stories have on the ground floor, a living-room of 131 super. ft., and two bedrooms of 110 super. ft. each, and on the first floor a living-room of 131 super. ft., and two bedrooms, one of 132 and one of 112 super. ft. Each tenement has a scullery with copper, gas stove, and sink, a coal store, water-closet, and dustbin and cupboards. Indeed, one feature of this design is in this type the provision of cupboards, especially over and under the stairs. In these three-roomed tenements one bedroom is in each case entered from the living-room and one from the lobby.

The four-roomed tenements in two stories have on each floor a living-room in front, of 144 super. ft., a bedroom in front, of 110 super. ft., and two bedrooms at the back, one of 112 super. ft. and one of 120 super. ft., together with watercloset and scullery in each case. In this plan all the bedrooms are entered from the living-room. The three-roomed tenements in three stories have on the ground and first floors a living-room of 139 super. ft. and two bedrooms of 110 super. ft., and on the second floor a living-room of 139 super. ft. and two bedrooms, one of 142 super. ft. and one of 123 super. ft. As in the author's two-story houses, one bedroom is entered from the living-room, and one from a lobby. These tenements have similar offices to those already described. The four-roomed tenements in three stories have on each floor a living-room of 144 super. ft. and three bedrooms of 110 super. ft. each, one bedroom being entered from a lobby, and two from the living-room.

In the construction proposed, the floors are laid with boards nailed direct on cokebreeze concrete, the upper floors having rolled steel joists to support the concrete. The stairs are also of concrete and the partitions of 3-in. cokebreeze concrete.

The authors estimate the cost of the cottage at 417*l.*, of the three-roomed tenements in two stories at 572*l.*, of the four-roomed tenements in two stories at 734*l.*, of the three-roomed tenements in three stories at 781*l.*, and of the four-roomed tenements in three stories at 891*l.*, these figures working out at 8d. per ft. cube of the cubical contents. The elevations are simply treated with effect gained by the use of small-paned windows.

In the second premiated design, the author groups together his designs for various types, instead of showing them as units as in the first premiated design, thus making a more effective elevation. He also dovetails his houses together, necessitating more length of party-walls than in the first premiated design, in which the units are separated by straight party-walls running from front to back in each case, a device which, although lending itself to more economical planning, increases the cost of building per foot cube.

Two variations of the cottage with five rooms on two stories are shown. In one there are on the ground floor a living-room of 166 super. ft. and a bedroom of 110 super. ft., and on the first floor three bedrooms of 138, 115, and 111 super. ft. respectively. In the other plans there are on the ground floor a living-room of 168 super. ft. and a bedroom of 110 super. ft.; and on the first floor, three bedrooms of 135, 114, and 110 super. ft. respectively. There is also in this design a third variation of the cottage as a semi-detached house at end of the block.

The three-roomed tenements in two stories have on the ground floor a living room of 165 super. ft. and two bedrooms of 110 super. ft. each, and on the first floor two similar bedrooms and a living-room of 170 super. ft.

The four-roomed tenements in two stories have three bedrooms each of 110 super. ft. with the living-room of 175 super. ft. on the ground floor and 180 super. ft. on the first floor.

The dwellings in these three stories are by this author grouped into a separate block; the three-roomed tenements on the ground floor have the living-room of 170 super. ft., one bedroom 110 super. ft., and the other 115 super. ft.; those on the first floor have the living room of 188 super. ft., one bedroom of 110 super. ft., and one of 118 super. ft.; whilst on the second floor the living-room is 188 super. ft., one bedroom 115 super. ft., and one 110 super. ft.

The four-roomed tenements in three stories have on the ground floor a living-room of 170 super. ft. and three bedrooms of 110 super ft. each; on the first floor a living-room of 180 super. ft., one bedroom of 110 super. ft. and two of 113 super. ft. each; and on the second floor a living-room of 180 super. ft., two bedrooms of 110 super. ft. each, and one of 111 super. ft. The author of these designs makes it a rule for the bedrooms to be entered from the living-rooms in both the two-story and three-story tenements.

For economy the author suggests that the foundations, which the nature of the site requires to be deep, should be constructed with piers and arches, so called, of concrete. The elevations are treated in the newest rough-cast mode, with tile roofs for two-story buildings and slate roofs for three-story blocks, the latter method being adopted so that the top story may be included in a mansard roof. Play of light and shade is given to the elevations by the introduction of oriel windows, of timber framing, and hoods over the doors. The author's estimate of cost is for five-roomed cottages, 343*l.*; for three-roomed, two-story tenements, 435*l.*; for four-roomed two story tenements, 536*l.*; for three-roomed tenements in three stories, 611*l.*; and for four-roomed tenements in three stories, 829*l.*, figures which work out at rather less than 7½d. per foot cube.

The author of the third premiated design adopts the dovetailing principle followed in the second premiated design, but makes a point of giving entrance to all bedrooms from a lobby or passage, and not from the living rooms. His estimate of cost is for the five-roomed cottages, 320*l.*; for three-roomed tenements in two stories, 477*l.*; for three-roomed tenements in three stories, 656*l.*; for four-roomed tenements in two stories, 594*l.*; and for four-roomed tenements in three stories,

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806*l*., which works out at a little over 7d. per foot cube.

The four designs to which additional prizes have been given follow more or less closely the lines of the first three, but are not quite so successful in compactness, the strong point in particular of the first premiated design. Nos. 4 and 8 do not adopt the dovetailed arrangement of plan, which is however followed by Nos. 19 and 23. No. 4 avoids entering bedrooms from sitting rooms, and in the three-storyed buildings suggests a half basement or lower ground floor. This design has a pleasing elevation but a somewhat expensive roof. In No. 8, the bedrooms are in some cases entered from the living rooms, but not invariably.

The author suggests economy by the use of flat roofs, but cubes the flat-roofed building at the same price as those with pitched roof, so that the comparison is not quite accurate.

No. 19 shows the bedrooms entered for the most part from lobbies, whilst No. 23 has some entered from bedrooms, some from sculleries, and others from passages or lobbies. The elevations in this design are simple but of good character.

Many other designs have good points, but the best have undoubtedly been selected for premiating, and the Battersea Borough Council may be congratulated on the response to their invitation and the amount of thought that has been expended.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday evening at No. 9, Conduit-street, W., Mr. W. Emerson (President) in the chair.

District Surveyors' Examination.

The minutes of the last meeting having been read and confirmed, Mr. Locke, the secretary, announced that the statutory examination of candidates for the office of District Surveyor was held on April 17 and 18. Of the candidates who attended, two passed, viz., Thomas Handy Bishop, jun., of Leighton Buzzard, and Arthur Maryon Watson, London. These gentlemen had been granted by the Council certificate of competency to act as District Surveyors in London.

Tradition in Architecture: its Function and Value.

Mr. A. N. Paterson, M.A., then read a paper on this subject, of which the following is an abstract :—

In defining the scope of his paper, the author said that, while guarding against a tendency to give undue prominence to the inheritance and teaching of past times, he sought to carry his audience with him in regard to the vital importance of tradition as an element in all art of permanence and value, in the hope mainly that the far-reaching voice of the Institute—not only within our own shores but throughout the Britains beyond the seas—might be expressed and asserted to restrain, to counteract, to check the too easily learned and pernicious teachings of the so-called "new art" movement, with certain cognate developments in English architecture. In using the term "tradition," he wished to disentangle it from another term with which it was apt to be confounded, viz., archæology. The idea expressed by the word "tradition" in this connexion was briefly : the influence, both conscious and unconscious, upon us as workers in art to-day of the methods of seeing and doing on the part of the many generations of workers who have preceded us, and who when in life were engaged in like problems to these which now occupy us. Tradition in this sense as regards architecture was twofold, viz., tradition in construction, tradition in design. Tradition must not be confused with style. Styles have their day, and pass. Tradition endures. It must also be clearly differentiated from archæology. The archæologist's attitude is that of the scientist, not the artist, much less the art-worker. Defining the term "art" in relation to architecture, the author said that it was the living creative interest which devotes itself to the design and erection of buildings which will satisfy the requirements, and be in accord with the sentiments, of the time ; that the art in these buildings is a necessary and natural outcome and development of similar work in the past, of which the technique is learned consciously and unconsciously through tradition ; and that archæology (with history in its train) is, at best, a science by means of which we may arrive at more precise knowledge regarding certain aspects of such work. That we should be able to say that a moulding is early, late, or transitional, will not influence our powers of plan and design ; its true importance to us is that in gaining exactness of knowledge as to such details, we are bound to increase our knowledge of the work itself, of the constructional difficulties and the means by which they were overcome and rendered unexpected points of interest, of the infinite variety, the enveloping harmony and the crowning beauty of the building, which through years, and maybe centuries, of growth ultimately reached the completed, the organic form in which we see it. Only—let such enthusiasm be kept under restraint. Do not let us take it for granted that because a feature looks well in an old building therefore it will be equally effective if tacked on to a new front.

In the spirit of the old work we admire, there are no qualities more pre-eminent than directness of aim and honesty of purpose. These two qualities we shall find to be most surely preserved by working after the methods of our more immediate forbears. Architecture, of all the fine arts, is most subject to convention, and that under two main influences, the one immovable, unchangeable, the limitation of that *construction* through which it must express itself, and which in its turn is subject to the all-pervading law of gravity ; the other, as constantly but gradually changing, the physical, mental, and spiritual requirements of those for whose use buildings are designed, together with the effective range of constructional resources at our disposal wherewith to satisfy these requirements. The accumulation of the tradition of former ages has provided us with certain methods, certain formulæ of construction, from which we cannot escape. On the other hand, it is only from our immediate predecessors, and even contemporaries, that we can gather to what extent the immediate requirements of the day must guide us in our use of these formulæ, and what constructional resources are available for the purpose of extending their scope. The leading contours of mouldings and the principles regulating their use, the right and beautiful in proportion—such as these are the traditional data with which architectural design is produced ; it is only when novel materials intervene, or in a particular situation, that variations, even to the extent of discords, are admissible and, in their place, admirable. Be sure, however, of the harmonies before introducing the discords. Only the master can successfully cope with the bizarre, the unexpected. There may indeed be a bondage of tradition as of archæology, but this is impossible when (and this the author took to be an essential and vital principle in the truly traditional attitude) it is accepted in its widest form, when the tradition of yesterday and even of to-day is regarded as of not less but more importance than that of the century of Wren, of the Gothic master-builders, or of the Greek and Roman classics, when the tradition of steel girder, plate glass, and electric light is accepted along with that of stone vault and flying buttress.

The author went on to speak of the present position of architecture in this country. For nearly a hundred years England has followed a path all her own in such matters, with results which can scarcely be called successful. The path has led, as it were, through a maze, and we are likely to end, when we emerge, precisely where we entered. Meanwhile, neighbouring Continental nations have been quietly pursuing and developing the traditions of earlier times in the light of modern opportunities and requirements, guided therein by a continuous and systematic study of architecture, with the result that, as regards civil architecture in particular, they are far ahead of us in achievement. Few modern English buildings compare with similar work in Paris and other European centres in any of the attributes which constitute architecture a great art ; yet English work of earlier date is equal, if not superior, to foreign. The moral is obvious : the fault is not the nation's or the men's, but the point of view, the methods, and, above all, the lack of continuous tradition ; while if the doctrines of the "modern school" are to prevail among our younger men, the outlook for the future is still worse. The author briefly glanced at the architectural history of England during the nineteenth century to make clear this idea. Within the last few years, however, the value of tradition, modern as well as ancient, has shown a tendency to reassert itself ; architecture, along with the crafts which nourish it, has been revivified, the true principles of design are being taught with organised effort, and but for this curious "new art" development there was good hope that English architecture would again assert itself in its natural and national characteristics of dignity and refinement. Of the doctrines of this "new art" or "modern school" there were various manifestations ; the one prevailing tenet seemed to be that the "copying of styles" is to be avoided as a deadly sin. Why ? asked the author. It was the first time in the history of architecture that a like position had been taken up, for it was surely an admitted fact that, from Assyria and Egypt onwards, the architects of Greece and of Rome, of the Romanesque, Mediæval, and Renaissance times, had no other idea in their minds but, in working out constructionally their fulfilment of contemporary requirements, to copy the styles which had gone before, as they knew them. Did the work thus produced suffer in regard to sympathy with the needs of the times, to nobility, to beauty, even to originality thereby ?

It is to this taboo of the styles that the characteristics of the new movement are to be traced. The refusal to employ the formulæ thus provided has its necessary result in the prevailing baldness, the absolute lack of variety and movement. The styles, especially those of the last few centuries, are essentially the product of civilisation ; the architecture of modern times is mainly that of the city ; but as recent precedents must be ignored, and architecture cannot escape from the traditional standpoint, inspiration must be sought in the times before city life existed, with a resultant sham rusticity, an assumed simplicity of living and thinking, entirely at variance with the thoughts and habits of those whose requirements the buildings are supposed to supply, and even, if due investigation were made, with those of the designers themselves.

Another characteristic, the result of the same tendency, is the attempt to return to the conditions of working of those earlier times when the individual worker was—or is now supposed to have been—his own master in the particular portion of the general work to which he devoted himself. The said individual worker is, of course, under present-day conditions, unable to play the part thus allotted to him, but if he is employed, not by a "firm," but by a "guild," all is right, and the utmost latitude is at once allowed to the producer in matters of furniture and ornament, with a consequent loss of homogeneity and restfulness in the general scheme. The half-trained amateur, again, too full of art enthusiasm to consent to the drudgery necessary to acquire technical skill in execution—being an "artist"—must be allowed absolute independence.

Encourage the crafts by all means, give the craftsmen every liberty within their own spheres—the architect will be aided and stimulated by their co-operation and help ; but his must be the guiding and controlling mind, and his work may, and often must be, independent of their aid. Let it not be thought that it is by working only on such lines as those just touched upon, as its devotees would have us believe, that one can be earnest, or even original. He was inclined to believe that the love of originality for its own sake was the root of all evil in the pursuit of the fine arts. For indeed that, desirable quality though it be, is just one that will not come by "taking thought" for it, and if it be sought after this fashion the result is but a superficial affectation which is at the opposite pole from those solid and enduring qualities which are of ultimate value in the arts. But if the architect, instead of seeking originality, and endeavouring to take it by force of devious paths and strange revivals, is content to follow the quiet lines of tradition, holding at the same time true to himself and the requirements and opportunities of his day, it will be found to have sought him. Future generations will see in his works the special beauties and qualities of his period just as we to-day discover them in those of our predecessors.

Mr. G. H. Fellowes Prynne, in proposing a hearty vote of thanks to Mr. Paterson, said he thought the subject treated was one of extreme interest, and in the main he could not help feeling that they most of them would certainly agree with the remarks made.

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With the idea of a study of the past and the following of tradition, he did most warmly and thoroughly agree. But he thought, perhaps, in his great wish to uphold the following of tradition, Mr. Paterson had rather been following on the lines taken by so many who had in that room and in the room below read papers during the last twenty years. They had so constantly heard those who had read papers abusing those who had gone before in the past century, but he thought it was a matter of evolution to a certain extent. They had certainly been passing through an almost revolutionary time in architecture during the nineteenth century, but at the same time an immense amount of good had come out of it—he meant by the thoroughness with which Early Classic work was studied, and the same applied to Gothic work. In the early phase of the revival in each style the idea of copying was not unnatural. He did not mean by any means to uphold the idea that copying in itself had been good, but the very deep studies of a great many of these Gothic and Classic men in the last century had been of very great service to students of the present day, so he could not agree with the writer of the paper that evil had been the total result. It seemed to be too much the fashion with a great many to abuse the work of our immediate predecessors. He did not mean to apply that to Mr. Paterson, for his paper was of an admirable character, but he meant that many people seemed to think, if their education had been in a certain groove—either Gothic or Classic, as the case might be—it was their duty to abuse the work of a different school of thought from that in which they had been brought up. It was noticeable with the Gothic phase, but it was equally noticeable at the present time. It was said a thing had passed and gone out, and there was no such thing as Gothic. It was folly to look at art in that one-sided and narrow way; they must surely take a much broader view. They must try to see the beautiful in all styles, and make that the foundation of future design, and whether it leans to the Gothic or the Classic. They found that eclecticism at the present day was too often only an excuse for absolute ignorance of the art the man tried to follow. They saw this even with writers of the present day. With regard to Liverpool Cathedral many foolish things had been said. One opinion was that it should be Classic, and that Gothic was dead, and the other was that Classic was dead; but this sort of argument was utterly absurd. If he might just refer to one point, he thought the whole idea of abuse in their own profession was unfortunate. One so often found himself abusing rather than finding the good things in other people's work; they were so accustomed to abuse and unduly criticise; it was so easy to criticise, but it was so very hard to do it well, and the more they really studied what was passed, and looked at the present men's work, and tried to look for the good in it and not the evil, he was sure they would find their art improve in the spirit of true art.

Mr. W. G. Wilson seconded the motion, and said he thought Mr. Paterson spoke rather feelingly. Mr. Paterson came from Glasgow, and the architects of Glasgow were a singularly capable set of men, but, unfortunately, they were either one thing or the other—they were either followers of the traditions or no, were men who would not be controlled in any way either in their art or their religion, and so he was afraid in a good many ways their liberty had degenerated into licence. It was his privilege to be in Glasgow not long ago, and he was really staggered to see the extraordinary emanations which came from the brains of some of the most prominent Glasgow architects, and so he thought Mr. Paterson spoke rather feelingly. At the same time he considered Mr. Paterson's practice was slightly in opposition to the paper he had read, because the excellent work which Mr. Paterson himself did afforded very close traces of the study of a somewhat unsuitable style—the Scottish baronial. He thought the last speaker got rather away from the point in speaking of the opposition Gothic men manifested towards Classic men, and the other way about. Did they not think that the true art of to-day was eclectic art pure and simple? If they went through a garden of flowers they did not make a bouquet all of roses, but they gathered beautiful flowers of different kinds, and the result was beautiful. Scotchman and Glasgowman although he was, he was bound to say that the most successful men in England seemed to be imbued with that sense of restraint which his countrymen somewhat lacked, and they would find that the most successful work of to-day was purely eclectic art—work which it would be hard to characterise as classic work, and equally hard to characterise a Gothic art. These men had learned in both schools, and the result in many cases was eminently satisfactory, and he said, with all respect to their French neighbours and other Continental neighbours, that the English work of to day showed more individuality, and seemed to meet the conditions of the times to a greater degree than much modern French work.

Mr. H. T. Hare said he felt very strongly that it was high time that a paper of that sort should be read in that room. He had listened during the last two or three years to several papers from the point of view, more or less, advancing the view that architects should attempt to be original, and therefore he thought that any paper which protested against conscious effort in originality must be of very great value. The idea seemed to be prevalent that if one studied and worked upon traditional lines that must of necessity kill all originality. That was not in his opinion the case by any means. If a man had ability it would come out, although he might work in Gothic, or Classic, or Renaissance, or any other style. They would see the originality there, although the work might be absolutely correct in all its lines. Therefore it was not necessary that one should be always striving after originality. One of the great evils of what was called the "new art" appeared to him to be in the fact that those gentlemen who were exponents of it absolutely divested themselves of everything that had gone before; they stripped themselves absolutely naked and would have nothing of it at all. Why a man who could afford to build a good middle-class house should sit in a room without any mouldings, and which was got up in the same style as a farm-house or a labourer's cottage, he could not say. He did not see why such a man should not have a bit of ornament or anything pleasing to the eye. He had known a case of a house in London which cost many thousands of pounds, belonging to a man who moved into high society. Why in the entrance to the hall he should have a large fireplace, with a gridiron hanging in it, he could not for the life of him see. But that was the sort of affectation he thought ought to be protested against in the strongest way possible, and although, if tradition was followed and studied, it might lead in many cases to a good deal of monotonous work, that was a thing which could not possibly be avoided, and that monotonous work as a whole would be much more pleasant and satisfactory than if it were carried out by men of mediocre talent, working without any guiding principles at all.

Colonel Prendergast said he confessed he was attracted by the title of the paper, for he felt there were great opportunities connected with it, and he had not been disappointed, for he thought it was one of the most important papers that he, who had been a member of that Institute for a good many years, had ever listened to. It was of the highest importance to them, who were professional workers, and it was, perhaps, of still greater importance to those who, like himself, were outsiders, and who were in lamentable ignorance of the whole position. The great British public never had a chance of hearing the ground work of the great science they were engaged in. They had papers there, but seldom or never was the general public instructed as to what the Institute were about, and the unfortunate thing was that if one moved about the Metropolis, one saw the most terrible forgetfulness of what should be. He need only instance two great squares in the town, viz., Hanover-square and St. James's-square. He would ask anybody, for instance, to go into those two squares and see the devastation which was taking place in them. They found fine buildings of the day in which they were put up, but he asked them to look at the abominable stuff recently erected at the corner of King-street, St. James's-square, and George-street, Hanover-square. It was the public who wanted educating, and if the lecturer could only get at those people, they might do something better. In the meantime, one came down to those rooms and listened to papers, and it generally ended in a squabble of the styles. But he thought that the matter was far wider than that. They had not to say whether Gothic or Classic was right, and what the reader of the paper had told them that night was that it was ridiculous to exclude tradition in a great science like theirs. They must go back, and not forget they had something to learn. He would like to say one thing, which was that they had a Royal Institute occupying a leading position, and yet somehow or another they were unable to keep in touch with the general public, and he thought a way ought to be found. The whole thing was carefully and excellently summed up when Mr. Paterson said that he was inclined to believe that "the love of originality for its own sake was the root of all evil in the pursuit of the fine arts." Their extreme difficulty was that they were face to face with a new structural method—the introduction of metal into buildings. They had now got to deal with residential buildings in great towns with great shop fronts below them. It seemed to him almost an insuperable difficulty, but he did not think that it really was so. It was to be done, and the sooner they faced it the better. If in doing that they did not include the great principle which had been so admirably put before them that night, and did not forget the traditions of the science, he was convinced that something would come out of it to the satisfaction not only of the Institute, but to the public at large.

Mr. E. W. Hudson said he was greatly obliged to Mr. Paterson for going into the ethical portion of the question, which ordinary individuals like himself could not do, but what perplexed his mind was that in these traditions, as in the preachers of the present day, there were so many voices, and amongst these voices there seemed to be some confusion. Which were they to follow? Apart from the question of style, if they studied tradition they must, to a certain extent, follow either Classic or Gothic, and there seemed to be a difficulty; a hybrid style, which was neither one thing or the other, seemed to be a most difficult thing to arrive at unless this new eclectic system was to be considered the medium between the two. Another thing with regard to their own architecture. It might be bad, but he did not think they could look either to the Continent or to America for a style which would give them the acme or the *ne plus ultra* of what they were trying to find. It seemed to him from the illustrations he had seen and the small observations he had been able to make, that they could not find much new work in the capitals of the countries of Europe which it was desirable to imitate. He did not think they desired to see the high-storied buildings of America in London. The libraries and other public buildings of America which they had heard explained in that room were no doubt very good, but he thought in their own works they would find things equally good. In mediæval times buildings certainly represented the wants of the age, and it was quite impossible to mistake a palace for a hospital, or a church for a Guildhall, and it was extremely necessary that bygone works should be studied in order to produce anything which was excellent at the present time. He thought a certain injustice had been done to the architects who had practised in the Gothic style by calling them archæologists. Fergusson said an "archæologist is a man who, in making the design for a building tries to imitate the form and details of some bygone age so exactly that it might, but for its newness, be mistaken for a work of an earlier period than that in which it was erected. The term applies equally to Egyptian, Classical, or Mediæval reproductions. In many respects the portico of the British Museum is a worse example of archæology than the design for the Law Courts, because, besides pretending to reproduce a dead style, it is one wholly unsuited to our climate." Of original work they had some examples in London, but whether they were any advance upon the works of those who studied tradition closely it was not for him to say—he meant the Grosvenor Hotel, the Charing Cross Hotel, and the late Strand Music Hall. The question was whether there was anything they could pick out in the work of the present day as the acme of what they ought to follow. What was to be the practical outcome of all the dissertations of the day?

The Chairman, in putting the vote of thanks, said he would like to say he thought this was one of the very best papers they had had in the Institute for many years. It was a paper full of

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thought. It pointed out the absolute necessity of the study of architecture and a study of the traditions of different phases. It entered a strong protest against the nonsensical affectation of crudeness of design which was called originality. He could not quite agree with Mr. Paterson in his remark that the influence of the revival of the last century must be deemed to have been for evil rather than for good. He did not agree with that altogether. The Classical revival which took place in the early part of the century was engendered by the Classic studies which men went in for in that period to a far greater extent than they did now as a general rule, and he supposed that the Gothic revival was caused by certain works which had been written and also possibly by the easier methods of transit, and to say this only resulted in evil he did not think was quite right. They taught men to learn, anyhow, and that, after all, was the first point. He had a strong feeling himself that the best sort of originality was obtained from the man who had the widest knowledge of ancient precedent. He used the word "ancient" both for Classic and Gothic. Originality that was simply caused by the affectation of the avoidance of acknowledged forms of the beautiful —the making of columns of absurd proportions, and cornices with mouldings entirely different to what was accepted as giving a good effect, without any *raison d'être* for the alteration, seemed to him entirely wrong. In the wonderful scientific researches that had been made during the course of the last century the result had been the most extraordinary developments of science. Those results were not obtained by men working without a study of what had gone before. Those researches were made in opposition to the lines laid down by certain schools in architecture who wished to ignore all precedent and go back to pre-historic times. What was the use of their having examples of English history and ancient architecture if they were not to profit by what had gone before? He had previously strongly entered his protest against that sort of theory. Education was the thing most necessary for the architect, and a wide education. Colonel Prendergast had referred to the education of the public, but as he had pointed out over and over again, the education of the public in architecture must result in the first place in the education of architects themselves, and only by the architect could the public be influenced in any way. He had certainly noticed that there was more interest and more education on the part of the public at the present moment with regard to architecture than there had been during any previous time in the history of this country. He constantly met people who had absolutely nothing to do with architecture who were greatly interested in new buildings, and who could pronounce an opinion on them, which was a thing they did not hear twenty or thirty years ago.

The vote of thanks having been heartily agreed to,

Mr. Paterson said it would be churlish of him not to recognise very humbly the very great appreciation they had shown of his efforts to think out the problem. Were he not a Scotchman he might sit down by saying "Thank you," but the Scotch dearly loved argument, and therefore he would like to enter a little protest against what he thought was a misapprehension of his sentiments with regard to Gothic and Classic revivals of the last century. Mr. Prynne and the President rather spoke as though he had decried them, and the President stated that he (the speaker) said nothing had resulted from them but evil. He strongly deprecated that view of the matter, for it was quite contrary to what he said.

The Chairman: I quoted your own words, "The influence of these revivals as regards the main is ues is evil rather than good."

Mr. Paterson said he still thought that, as regarded the main issue, that was so. He thought Mr. Prynne was quite right in cautioning architects in general against the abuse of the works of their fellows, still he thought these were times when it behoved one to speak out, and he felt very strongly that the present tendency, unless checked, was likely to do harm to the progress of architecture in the country. With regard to the position of English civil architecture as compared with Continental architecture, several gentlemen had said there were as good buildings here as on the Continent, but none had given an example. Of course, in every country there was mediocre architecture, and the outstanding work of genius must in all cases be the exception; but if they took the flower of the art on the one side, they must take it on the other. No doubt there was a lack of interest in much of the modern French architecture, but he maintained that it was better than the blatant vulgarity of much they had on this side. The only other point was that of Mr. Wilson with respect to the suitability or otherwise of the Scotch domestic architecture to modern needs. That was a difficult question, and it was a sort of red herring thrown across the trail. Some time, perhaps, he would be able to take up the cudgels on behalf of Scotch domestic architecture.

The Chairman announced that a special meeting would be held on Monday, May 5, to elect the Royal Gold Medallist for the current year. At the conclusion thereof, the annual meeting would be held, when the annual report of the Council would be formally proposed for adoption; the Statutory Board of Examiners would be appointed; auditors nominated for the ensuing year; and scrutineers appointed to direct the annual election. An election of candidates for membership would also take place. At the same meeting would be brought forward certain alterations in the Institute form of contract proposed by the Contract Committee, in order to have the form available for use where quantities are in the contract.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION:

ANNUAL DINNER.

MR. FREDERICK LIONEL DOVE (Messrs. Dove Bros.) presided on Tuesday evening at the Holborn Restaurant, over the twenty-fourth annual dinner of this Institution. The company numbered close on 300, amongst those present being the Rev. C. J. Proctor, Messrs. J. Murray, A. Parker, L. J. Maton, F. J. Dove, R. D. Lown, J. Carmichael, G. Appleton, H. H. Bartlett, T. F. Rider, A. Stoner, A. Randall, F. Lown, H. S. Dove, R. Roberts, E. Brooks, J. Austen (sec.), &c.

The usual loyal toasts having been honoured, Mr. H. H. Bartlett proposed "The Imperial Forces," and this was replied to by the Rev. C. J. Proctor (an ex-volunteer).

The Chairman, in proposing "The Builders' Clerks' Benevolent Institution," said that with a view to inducing those who had not made up their minds what they were going to give, he would give a short *résumé* of the history of the Institution. About thirty-six years ago some few gentlemen who were engaged upon the staffs of some of the leading builders of London met together, and, imbued with the kindly spirit which was always associated with those connected with bricks and mortar, resolved to found a benevolent fund for the relief of their more unfortunate brethren. He need hardly tell them that amongst men who every day of their lives were associated with the brain-destroying eccentricities of architects' drawings and surveyors' quantities, and, above all, builders' accounts, such an idea at once took tangible shape, and they decided not only at once to render temporary aid to poorer members, but also to organise a system of pensions. Before long they admitted widows of deceased members to the benefits of the Society, and of course it was a short step from the widows to the orphans, and at the present time there were something like twenty or thirty widows and orphans, besides the decayed members of the profession, who were receiving benefits—the former in the way of pensions and the orphans in the way of being clothed and educated and fitted for the battle of life. In such a huge and complex trade as they were engaged in, with the keen competition, it was obvious that slackness of trade resulted at times in a certain number of men being thrown out of employment through no fault of their own, and there were few sadder sights than that of men who had done good service for many years, owing to the exigencies of trade having no employment and, without private benevolence, having nothing to fall back upon but the workhouse or starvation. It was such cases as those that the Society relieved. The Society appealed particularly to three classes of the community, viz., builders' clerks, builders, and builders' merchants. He strongly appealed to all builders' clerks who were not at present members of the Society to join at once, for it was like an insurance to them. He could mention that, with the exception of the small and insufficient remuneration paid to the secretary and the collector, nearly every penny of the money subscribed went to the Society. With regard to the builders, he thought the Society afforded an opportunity for increasing the friendly and happy relationship which always existed between builders and their staffs, and as to the merchants, they knew it was the builders' clerk who made things go smooth in the office. He coupled with the toast the name of Mr. E. Brooks, who was connected with the firm of Messrs. Colls & Son.

Mr. E. Brooks (Treasurer), in reply, said he had in his hand the first report issued by the Society, and he found that of the thirty members of the committee in that year only himself and two others were left. The first report showed that their income was 63*l.*, and now they had 7,000*l.* invested. He did not think, however, that that was sufficient for thirty years' existence. They formerly used to give a 20*l.* a year pension for men and 15*l.* for widows, but now they gave 30*l.* a year to the men, and 24*l.* to the widows. He trusted that the appeal of the Chairman to builders' clerks to join the Society would bear fruit.

Mr. R. Roberts, in proposing the toast of the "Architects and Surveyors," said that the builder worked primarily for profit, but the architect had the enthusiasm of a love for art, and the surveyors were well known for their elaborate detail, and their mathematical accuracy. Taking them altogether, he thought they were a great triumvirate. They could not exist apart, as the artistic ideas of the architect required to be put into practice by the builders, and had to be always weighed and measured, not always to their satisfaction, by their surveyors. Having been a builder for something like thirty years, he could only say that, as a rule, the relationship between the builders and the architects and surveyors were exceedingly pleasant. Of course, they knew that at one time the builder was his own architect, but in these days of industrial development that was impossible. He thought there were great opportunities before all three classes, for in the next ten or fifteen years London would practically be rebuilt. They had very serious problems ahead, but the architects had shown great skill with regard to the scientific planning of buildings.

Mr. J. Murray replied briefly for the architects, and remarked that the work of the architect could be greatly assisted by builders' clerks. If the builders' clerks did their work with thoroughness and good fellowship it would assist architects as well as builders. That meeting, he thought, was a fair example of the thoroughness with which builders' clerks did their work, and he hoped they would have the greatest possible success in the future. He believed that if architects could in any way assist builders or builders' clerks they would be only too happy to do so.

Mr. A. Stoner, replying for the surveyors also touched upon the pleasant relationship which existed between builders and surveyors. He took it that the duty of the surveyor was to apply the schedule of impartiality between the architect and builder, and he could say that that had always been his aim.

Mr. F. S. Oldham submitted the toast of "The Builders," and remarked that the builders of London had always generously supported the Institution.

Mr. A. Parker, in reply, alluded to the builder having been once his own architect, and said that for himself he preferred to do the work of building and leave the architect and surveyor to do their own work.

The other toasts were "The Donors and Subscribers," proposed by Mr. F. J. Dove, and responded to by Mr. C. Lewis Jones; "The Past Presidents"; and "The Executive."

During the evening subscriptions were announced to the amount of just over 300*l.*, the chairman contributing 25*l.*

APPOINTMENT OF SANITARY OFFICERS. — The Local Government Board has sanctioned the appointment of the following sanitary officers:—Mr. W. Rowsell, sanitary inspector in Bethnal Green; Messrs. C. S. Wansbrough, G. J. Miners, S. W. Wingfield, E. J. Grivell, and C. Lawrence and Miss L. M. O'Kell and Miss F. M. Nicholas, sanitary inspectors in Paddington; Mr. H. E. Brown, sanitary inspector in Wandsworth; Mr. A. W. Loughlin, temporary sanitary inspector in Greenwich; Miss A. J. Salford, sanitary inspector in the City of London.

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THE SURVEYORS' INSTITUTION.

IN consequence of the unexpected prolongation of the proceedings of the general meeting of members on the 14th inst., when various recommendations of the Council as to proposed alterations of the charter and by-laws were considered, it was found necessary to postpone the reading of the paper on "Compensation for Fruit Planting," by Mr. C. H. Hooper, until the ordinary general meeting of Monday, April 28, after the general meeting of members called for 7.30 on the same evening for the confirmation of the resolutions passed at the last meeting.

The annual dinner of the Institution will be held on Wednesday, May 7.

It has been decided, on the invitation of the Cambridge, Huntingdon, Norfolk, and Suffolk Provincial Committee, to hold the next country meeting at Cambridge on May 22 and 23. The morning of the first day will be devoted to papers and discussions, after which the visiting members will be entertained at luncheon by the Provincial Committee. The afternoon will be devoted to an inspection of the colleges and university buildings, and a visit to Ely, with a dinner in the evening; the second day to excursions to Sandringham (by permission of his Majesty the King), and to Cheveley, by invitation of Colonel McCalmont, M.P.

THE LONDON COUNTY COUNCIL.

MR. J. M'DOUGALL, Chairman, presided on Tuesday, at the County Hall, Spring-gardens, over the first meeting of the Council after the Easter recess.

The Coronation.—Captain Swinton asked the Chairman of the General Purposes Committee whether he had seen his proposal that on the night of the Coronation, under the organisation of the County Council, and as their contribution to the rejoicings of the day, both banks of the Thames should be illuminated from Lambeth Bridge to Blackfriars Bridge, and firework displays be given from the sides of the three intervening bridges, and whether he would approve of a special Sub-Committee being appointed to interview the frontagers and other interested parties, and discover what assistance they might look for from them.

Dr. Collins said some misapprehension seemed to exist as to who was responsible for the licensing of the wooden stands which were being erected for the Coronation. In 1897 the Council were responsible for the licensing, and not a single accident occurred.

Mr. R. E. Robinson replied that the Metropolitan Borough Councils would be responsible for the supervision and licensing of wooden structures, while the power of the supervision of balconies remained with the Council.

Lord Monkswell said, with regard to Captain Swinton's question, he thought, under the circumstances, it would be better for him to lay the matter before the Coronation Committee.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Camberwell Borough Council 35,000*l.* for the purchase of land for a cemetery; Hammersmith Borough Council 2,000*l.* for works at wharf and for paving; Battersea Borough Council 2,285*l.* for electric-light installation; St. George's (East) Guardians 3,000*l.* for alterations at the infirmary; Metropolitan Asylums Board 150,000*l.* for additional accommodation for small-pox patients; Kensington Borough Council 7,540*l.* for paving works, and 23,429*l.* for street improvements (sanction to loans); Woolwich Borough Council 5,600*l.* for electric lighting works; Wandsworth Guardians 11,870*l.* for extension of infirmary; Lambeth Guardians 51,355*l.* for alterations and additions to workhouse and infirmary; and Bethnal Green Guardians 5,690*l.* for supplying water to the infirmary.

Paving Works, Millbank.—On the recommendation of the Housing of the Working Classes Committee, it was agreed that the expenditure of a sum not exceeding 5,540*l.* in respect of the permanent paving works on the remainder of the Millbank Estate and on the portion of Rochampton-street leading thereto be sanctioned; that the work be carried out by the Council without the intervention of a contractor.

Houses Let in Lodgings.—It was agreed to address a letter to the Local Government Board stating that, in the opinion of the Council, it is very desirable to obtain a decision of the Courts as to whether exemption clauses can legally be inserted in by-laws as to houses let in lodgings; and asking whether the Board will co-operate with the Council with this object.

Theatres, &c.—Various works at the following buildings were agreed to on the recommendation of the Theatres and Music Halls Committee:—

Britannia Theatre (Mr. B. Crewe for Messrs. A. L. Crauford and C. Hobson).

London Exhibitions, Earl's Court (Mr. H. Hart).

Theatre, St. Martin's-lane (Mr. W. G. R. Sprague).

Savoy Theatre (Mr. G. H. Holloway for Mrs. R. D'Oyly Carte).

Star Music Hall, Abbey-street, Bermondsey (Mr. J. Hart).

Lyceum and Vaudeville Theatres.—The Theatres Committee reported:—

"On October 8, 1901, a sealed notice was served by direction of the Council on the owners of the Lyceum Theatre requiring them to carry out certain structural alterations to the building. An intimation was subsequently received from Messrs. Fladgates & Co. to the effect that the owners appealed against the notice and desired that their appeal might be referred to an arbitrator as provided in Section 11 of the Metropolis Management and Building Acts Amendment Act, 1878 (41 and 42 Vict., c. 32), under which the notice was served. The Council, in compliance with the wishes of the owners of the theatre, applied to his Majesty's First Commissioner of Works for the appointment of an arbitrator. Mr. W. Emerson, P.R.I.B.A., was accordingly appointed, and sat at the Westminster Palace Hotel on March 19, 20, 24, and 25 last, when Mr. F. F. Daldy represented the Council. Mr. E. Flint, F.R.I.B.A., and Mr. H. C. Clarke, F.S.I., were retained by the Council as expert witnesses to give evidence in support of its requirements. On the 14th inst. the arbitrator summoned the parties before him at his offices and explained that upon the terms of the present submission he felt great difficulty in making such an award as would dispose of the questions in issue, and answer the purpose for which the arbitration had been held. . . . . He suggested, therefore, that the Council on the one hand and the proprietors of the theatre on the other should sign and address to him some letter or other form of authority empowering him to prescribe the manner in which any requirements he may consider necessary should be complied with. The observations of Mr. Emerson also apply to the Vaudeville Theatre, in which case a sealed notice was served by the Council on the owners of the building on January 22, 1901, and appealed against. Mr. Emerson sat as arbitrator in this case at the Westminster Palace Hotel on March 18 last and 15th inst., the Council being represented by Mr. Daldy, and Messrs. Flint and Clarke being retained to give evidence in support of the Council's requirements."

The Committee recommended accordingly and the recommendation was agreed to.

Reconstruction of Bridge.—The Bridges Committee recommended, and it was agreed, that the estimate of 1,100*l.* submitted by the Finance Committee for the reconstruction of Beckenham-lane Bridge be approved, and that the engineer be instructed to prepare the necessary plans and specification.

District Surveyors' Districts.—The Building Act Committee recommended as follows:—

"The Council on November 10 last resolved to amalgamate the two districts of North-East and South-East Deptford, and to issue advertisements inviting applications for the appointment of District Surveyor for the new district thus formed, and to be known as Deptford East. Since that date, however, it has been found that the fees received last year in respect of the district as constituted did not amount to 500*l.*, and it is probable that the fees received in succeeding years will amount to even less. By the standing order of the Council the minimum value of a district is fixed at 500*l.* per annum, and it is therefore necessary to make other arrangements with regard to the district of Deptford East. We are of opinion that the best course will be to add this district to the adjoining district of Greenwich, which is at present supervised by Mr. B. Tabberer. We have ascertained that Mr. Tabberer is willing to perform the duties of District Surveyor within the enlarged district formed by the amalgamation of the districts of Greenwich and Deptford East, and to relinquish all private practice within such district. We recommend:—

(*a*) 'That so much of the resolution of the Council of November 10, 1901, in regard to the districts of North-East and South-East Deptford, as relates to the issue of advertisements inviting applications for the appointment of a District Surveyor for the district of Deptford East, formed by the amalgamation of such districts, be rescinded.'

(*b*) 'That the district of Deptford East be added to the district of Greenwich on condition that Mr. B. Tabberer, the District Surveyor for Greenwich, do not carry on business as an architect, surveyor, or builder, or be directly or indirectly, as a partner or otherwise, interested in such business within the district formed by the amalgamation of the districts of Deptford East and Greenwich, and to be known as the district of Deptford East and Greenwich, and that this arrangement do take effect on and after May 1, 1902.'"

The recommendations were agreed to.

Tenders for Electrical Cars.—The following recommendations of the Highways Committee were agreed to:—

(*a*) "That the tender of Messrs. Dick, Kerr, & Co. be accepted for the supply, for the sum of 71,754*l.*, of 100 double-decked, double-bogie, electrically equipped cars, required for use on the London County Council Tramways, when reconstructed for electrical traction. . . ."

(*b*) "That Messrs. Dick, Kerr, & Co. be allowed to sublet—(*a*) to the J. G. Brill Co., Philadelphia, U.S.A., the manufacture of the car-trucks; (*b*) to the Electrical Railway and Tramway Carriage Works the manufacture of the car-bodies; (*c*) to Messrs. J. G. White & Co. the manufacture of the car-ploughs; and (*d*) to the English Electric Manufacturing Co. the manufacture of the electrical equipment and motors, for the cars specified in the contract. . . ."

Tube Railway Bills.—The Parliamentary Committee submitted a long Report on the action they were taking in Parliament with regard to twenty-six Bills dealing with the construction of tube railways in London, and recommended that their action be approved. They had considered the Bills from many points of view, particularly the manner in which they would meet the requirements of the travelling public and assist in the development of London; their bearing upon the housing question, and the conveyance of persons of the labouring classes. It appeared quite clear that all the schemes would not have the sanction of Parliament, and in the first place the Committee regarded the Bills from the point of view of the routes proposed to be traversed, and afterwards they directed their attention to the financial proposals which the Bills contained.

The Highways Committee, also reporting on the question of tube railways, remarked that they felt very strongly the urgent necessity of some specially-constituted body being established, to which new schemes for the provision of means of transit in London might be referred, in order to secure uniformity and systematic action in the matter. They regretted that his Majesty's Government had not seen their way to take some action on the line of the suggestion made by the joint committee. It appeared that the course taken of referring the various schemes for tube railways to separate committees of Parliament would tend to make the task of the Council in dealing with—and, if necessary, opposing—the proposals a somewhat difficult one.

Mr. Benn observed that the Council was in rather an unfortunate position. It should be made clear that the Council would accept no responsibility for what would happen if no organised system were adopted for dealing with these underground railways, which were now being scrambled for by speculators.

Mr. Beachcroft hoped some of the schemes now before Parliament would not become law, but the Council must be careful not to offer any check to the improvement of means of locomotion in London.

Mr. Baker said he preferred shallow underground tramways to tubes, in the interest of the public, who would have to pay the largely enhanced cost of the latter.

After further discussion, the report was adopted.

Mr. R. Williams moved:—

"That it be referred to the Housing of the Working Classes Committee to consider as to the advisability of establishing a branch of the Architect's department on the White Hart-lane estate, Wood Green, for the purpose of carrying on the preparation of plans and details under a resident architect, so that the estate may be developed forthwith by the Works Committee supplying materials and labour, the resident architect supervising such labour under the direction of the Council's Superintending Architect."

The motion was lost. The Council then adjourned.

We are asked to state that Mr. Cecil A. Sharp, whose appointment to the post of Chief Constructional Assistant to the Council was notified in our issue of March 29, has subsequently declined the post on finding that he could not retain his private practice along with it.

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COMPETITIONS.

UPPER STANDARD SCHOOL FOR DUDLEY.—On the 14th inst. a meeting of the Dudley School Board was held in regard to the proposed new upper standard school. Alderman G. H. Dunn, who presided, moved the adoption of the report of the Special Committee, remarking that Mr. Bailey, Architect to the London School Board, who had been called in as an expert, had examined the nine sets of competitive plans sent in, and considered the most suitable ones to be those of Messrs. Barrowcliffe and Allcock, of Loughborough, the carrying out of which, he was assured, would come well within the estimate of 10,090*l*. Mr. F. W. Cook seconded, remarking that the main school would be a two-story building, the boys being accommodated on the lower floor and the girls in the upper story. The resolution was adopted.

NEW SCHOOLS, HIGH BROOMS.—As the result of a limited competition, in which six local architects took part, the Southborough (Kent) School Board have appointed Mr. C. H. Strange, A.R.I.B.A., of Tunbridge Wells, architect for their new schools at High Brooms.

EPILEPTIC COLONY, LANGHO.—The time for sending competition drawings for the above, for the Chorlton and Manchester Joint Asylum Committee, has been extended to May 2.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—This Society held its last meeting of the session on the 17th inst. at the rooms in Park-street, Leeds. Mr. Butler Wilson, F.R.I.B.A., was elected President for a second year, and Mr. R. Wood and Mr. G. F. Bowman were appointed Vice-Presidents, the former being re-elected. It was mentioned by the Secretary (Mr. H. S. Chorley) that there had been an increase of twenty-six in the membership of the Society during the year. He added that while professional interests had been carefully watched over—notably in connexion with the proposed new building by-laws and the assessorship of the recent public baths competitions—greater attention than previously had been paid to matters of public interest, instancing the steps taken by the Council of the Society in regard to the Queen Victoria memorial. The President observed that the work of the Society had been consolidated and strengthened during the past year, and that the aim of the Council during the ensuing year would be to give effect to the proposal to provide increased facilities for students, notably in establishing a Chair of Architecture at the Yorkshire College—similar to that at Liverpool. It was hoped, he said, that the allied societies and independent architects of the county would combine to put the proposed Chair upon a sound financial basis.—Subsequently Mr. J. Starkie Gardner, F.S.A., of London, gave a lecture on "Decorative Wrought Iron Work," showing illustrations of work, mostly of the seventeenth and eighteenth centuries, from Italy, Spain, Germany, and France, examples of which are being gradually collected and carefully classified at South Kensington. In the sixteenth century the English smiths far outrivalled their continental confrères in design of metal work, not from any advantages of site or materials, but from an innate love of form which continental craftsmen, notwithstanding their culture and civilisation, were unable to equal. The age of wrought metal, said Mr. Gardner, had passed. Royalties and municipalities will not now expend the necessary amount so ungrudgingly and lavishly given in the days of Louis XIV. and XV., who expended many million livres upon this one craft. Cast iron and rolled steel have hastened this regrettable decline. — In proposing a vote of thanks to the lecturer, Mr. R. P. Oglesby pointed out that some attention is now being given to the artistic treatment of engineering structures, instancing the buildings of the Paris Exhibition.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual report of this Association shows that it now numbers fifty-seven Members, seventy-four Associates, and eighty Students; 211 in all. The report summarises the work of the past Session, but contains no special point for observation. The Sketching Club among the students is said to have proved very successful, and a Designing Class has been formed, for which Mr. W. Glover has offered prizes for the two best designs. Mr. F. W. Morgan has set the subjects—"A Pair of Semi-Detached Villas" and "A Town Dwelling to be Altered to Business Premises." These are now being worked out, two months being allowed for each.

BRISTOL SOCIETY OF ARCHITECTS.—The annual general meeting of this Society was held at the Fine Arts Academy, Queen's-road, Clifton, on the 14th inst., Mr. Frank W. Wills (President) in the chair. After the confirmation of the minutes of the last annual general meeting, the scrutineers appointed for the election of officers and council reported that the result of the voting was as follows:—President, Mr. Joseph Wood; vice-presidents, Messrs. G. H. Oatley and F. W. Wills; council: Messrs. W. L. Bernard, F. Bligh Bond, J. H. La Trobe, Thomas Nicholson, W. S. Skinner, and J. Foster Wood; hon. secretary and treasurer, Mr. H. Dare Bryan; associate members of council, Messrs. M. A. Green and T. H. Weston. The annual report of the council was then read by the hon. secretary and the audited accounts presented, and, upon the motion of the President, were adopted. A lecture devoted to architectural research was then delivered by Mr. J. Atwood Slater, describing an architectural tour undertaken in 1880, and detailing the architecture and incidents of personal concern dependent on travel met with in the departments of Seine Inférieure, Seine and Oise, and Seine, penetrating into the heart of France as far as Auxerre. The course of the Seine, with its diverse monuments, was topographically followed from Harfleur to Paris, and subsequently in its considerable ramification, the stately River Yonne, Melun, Fontainebleau, Sens, and finally the rich town of Auxerre coming under consideration. The lecturer also drew special attention to the advantage derived from travelling alone for the purpose of observing better the archæological wealth and customs of the French, having a distinct and definite line of study and object lesson ever in view; to his wide sympathy with the French people; to their sumptuous care for their ancient monuments, their courtesy and reverential manner of hospitality towards English-speaking students; and also in particular to the unsuspicious, deferential manner in which they are entertained and regarded by the Ministerial authorities, detailing in precise biographical manner his experience with bourgeois and with peasant, ecclesiastic and soldier. He recorded also the incidents and popular events associated with travel, as study and the tide of time goaded him onward, the wave of diurnal events lying upon the open page of history, here dishevelled, here streaked with adverse episode, and there becalmed. A vote of thanks to Mr. Slater having been passed, Mr. Joseph Wood, the new President, thanked the members for his election, and proposed a hearty vote of thanks to the retiring President (Mr. Frank Wills). This was seconded by Mr. G. H. Oatley, and supported by the hon. secretary. The retiring President acknowledged the vote, and referred in complimentary terms to the assistance he had received from Mr. H. Dare Bryan, the hon. secretary, who had consented to serve in that capacity for another year. The proceedings then terminated.

GLASGOW INSTITUTE OF ARCHITECTS.—The Report of the Council for the Session 1902-3 states that one member has been added to their number, and one has died, leaving the total roll of seventy-two members unaltered, with ten honorary members. The Photographic Collection Committee have now completed the set of architectural photographs brought together in connection with the recent International Exhibition in Glasgow, with the exception of the arrangement and printing of titles, which is in progress, and will shortly be completed. The intention is that the photographs now brought together, illustrating the architecture of Glasgow, from the Cathedral down to buildings of the most recent times, may form the nucleus of a larger collection, in which all the works of architectural interest in Glasgow and the West of Scotland will be included. Space has been provided for such an extension of the collection, and members and other architects are invited to present to the Institute photographs of buildings erected from their designs, and coming within the category mentioned, that they may form part of the collection. The ninth triennial competition for the Alexander Thomson Travelling Studentship falls to be held this year, the drawings to be lodged with the secretary by December 26. A carefully-prepared programme has been drawn up by the committee, of which Mr. Paterson is convener, consisting of (1) Restoration of the Tower of the Winds at Athens, and (2) Design for a building to accommodate the Fine Art Department of a University. The programme has been framed on lines which, it is hoped, will encourage a more severe and careful study of the styles of architecture specified in the Deed of Trust. As a further stimulus, the trustees have offered a second prize of 20*l*., should the quality of the work submitted and the number of competitors warrant this. The council are glad to report that the individual applications for copies of the programme have far exceeded their expectation, based on former competitions, as these already number upwards of seventy, and have come from all parts of the kingdom.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—A meeting was held on the 16th inst., Mr. C. H. Compton, V.P. in the chair. The Rev. J. A. Penny exhibited a book of psalms in German and Dutch of early sixteenth century date, also a curious finger ring of red sard stone from Italy and a bronze stud, part of a shield, Saxon, of the ninth century. Mr. Penny afterwards read an interesting paper on "Curiosities I Have Seen in and About Churches." After mentioning several examples of socalled "low-side" windows in various churches more or less fairly well-known to ecclesiologists, he noticed the hagioscopes in the church at Bridgewater and the three recently discovered at Chard Church in the same county, and then described the unusual recess on the exterior of Crewkerne Church. This is situated at the south east corner of the south transept and consists of a pointed arch between two buttresses, the space above being roofed over with stone slabs, thus forming an arched recess nearly 8 ft. high by about 3 ft. wide. At the back against the wall of the church is a stone seat 16 in. wide and 18 in. high, the full length of the recess, the floor of which is, now, about 16 in. above the ground outside. In the wall above the seat is a niche, probably for a statue. What was the purpose of this recess? Mr. Penny remarked that he remembered when a boy seeing a similar construction outside a church in Scotland, which was locally said to have been a place of penance. A similar tradition existed at Crewkerne, but tradition alone was not conclusive. Might it not have been the bishop's seat for the settlement of disputes in the days when churches and churchyards were the general places of assembly? Outside the south wall of Cannington Church in the same county were twelve dedication crosses all alike and in capital preservation. This was a very unusual arrangement, as it was customary to place three on the east wall, three on the west wall, and three on the north and south walls respectively. In this instance, however, the south wall seemed to have been the only available space, owing to the buildings of Cannington Nunnery abutting closely upon the church. —A paper was next read by Mr. Andrew Oliver "On Some Old London Views," which was well illustrated by specially prepared maps and engravings from Mr. Oliver's large collection. The maps indicated with great clearness the sites of the old monastic buildings and churches which were destroyed at the time of the Great Fire and subsequently. Amongst the ruins were old London Bridge, St. Katharine's, The Tower, &c. The Chairman, Mr. W. J. Andrew, F.S.A., Mr. Rayson, Mr. Patrick, and others took part in the discussion which followed the papers.

SAVOY THEATRE.—A new iron and glass covered-way has just been completed at the Savoy, in connexion with the alteration of the levels between the Savoy Hotel and the Strand. The St. Pancras Iron Co. carried out the work.

LIBRARY, LEEDS.—The new library which the Leeds Corporation has provided for Armley and district has just been opened. The building is Renaissance in style with dressings of Morley stone. It is situate at the corner of Stocks Hill and Wesley-place, and the principal entrance is surmounted by a clock tower, which also contains a fan for extracting vitiated air from the apartments. The general reading-room is 60 ft. 9 in. by 76 ft. and there is a ladies' room, whilst on the lower floor is a reading-room for juveniles 60 ft. 9 in. by 36 ft. Mr. Percy Robinson, of Leeds, prepared the design for the structure.

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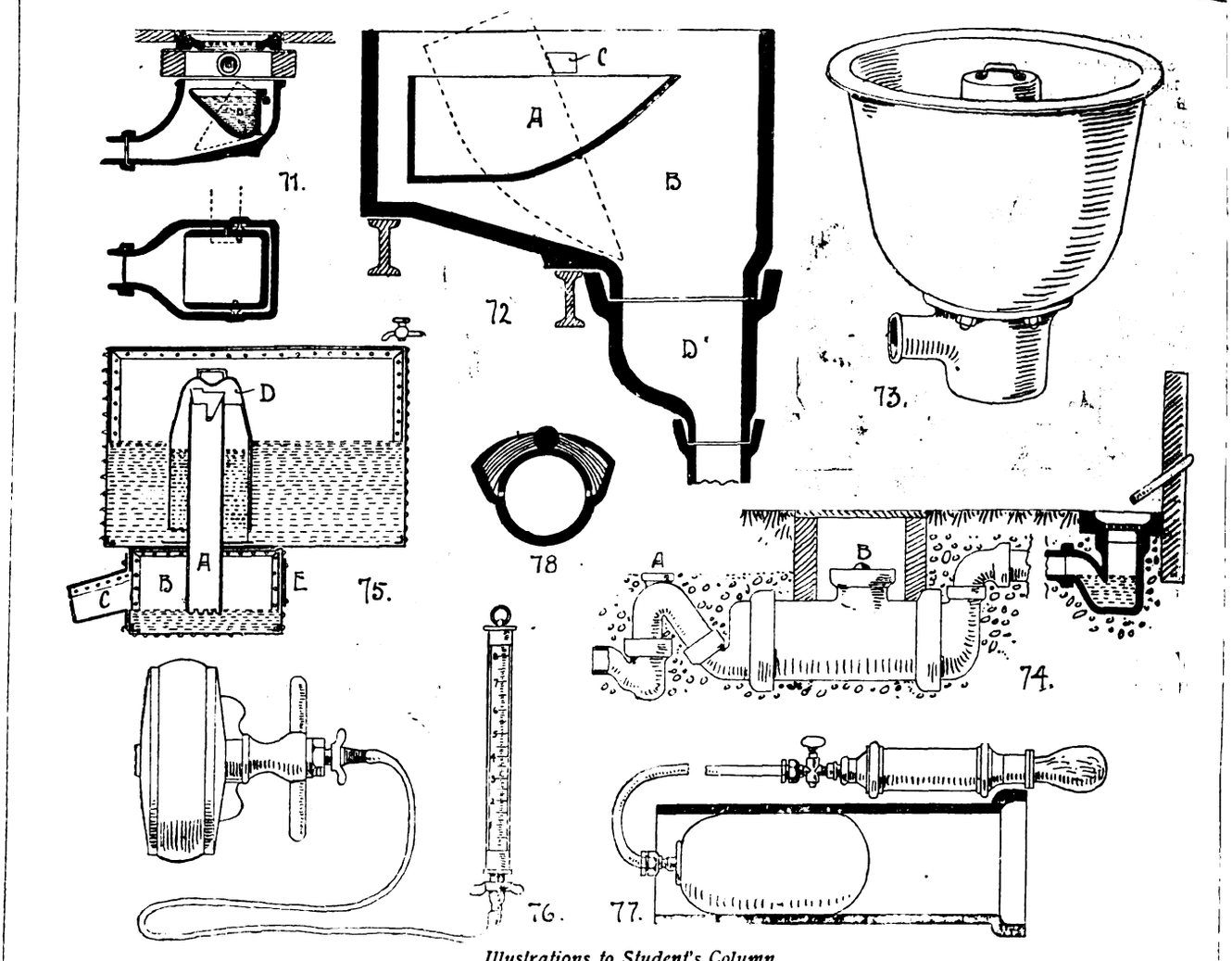

Illustrations to Student's Column.

The Student's Column.

PART II.—DRAINAGE.

CHAPTER 15.—FLUSHING AND TESTING.

FLUSHING.—If a drainage system is properly designed and carried out, special flushing appliances are as a general rule unnecessary. There is something radically wrong with a drain which can only be kept clean by the frequent discharge of large volumes of fresh water. Perfect jointing and true alignment of the pipes, good gradients, and exclusion of sand and gravel by means of silt traps, &c., go far to prevent deposits in drains, and it is much better to prevent deposits than to allow them to form, even though a flushing tank is provided to ensure their periodical removal. The discharges from baths and butlers' sinks will in many cases serve to keep the drains clean, if the outlets and wastepipes are of sufficient size. Rainwater-pipes, if the positions are carefully selected, are also of great service in rainy districts, although, of course, the flush obtained from them is irregular both in quantity and time. This disadvantage might be reduced by running the rainwater to a large storage tank from which a fixed quantity might be discharged automatically or by hand at regular intervals.

The simplest form of flushing arrangement is the "tipper" or "tumbler," of which an example is given in fig. 71. These are made of stoneware in various sizes, discharging 3, 5, 10, 20, and 33 gallons respectively. They are designed for fixing under waste-water gullies and rain-water pipes, and may be advantageously used in places where the water-supply is strictly limited. The collected sewage is discharged with considerable velocity, and has an appreciable influence in keeping the drains free from deposits. The illustration gives a plan and section of Duckett's 5-gallon tipper fixed under a dish and grate. The waste-pipes and rain-water pipes may discharge over or under the dish; a trap must, of course, be fixed at or near the outlet of the tipping chamber in order to disconnect the waste-pipes from the drain. The same principle is applied to overhead flushing tanks supplied with fresh water. Oates & Green's tank (fig. 72) of this kind is made in two sizes to discharge 5 and 10 gallons respectively. The tipper A is suspended on pivots in the tank B, and revolves within the limits imposed by the rubber buffers C; D is a patent concentrating channel introduced to ensure a solid flush.

Siphon flushing tanks are also made for collecting and discharging sewage, and may be used where the water-supply is inadequate, but only comparatively clean water, such as rainwater from roofs and the waste water from baths and lavatories, ought to be conveyed to them. Fig. 73 shows Adams's flushing tank of this type; it is made of cast-iron, in sizes of from 15 to 100 gallons, and in brown or straw glazed ware from 15 to 30 gallons. Another variety, made by the same firm, requires less depth from inlet to outlet (fig. 74), but does not act with a "dribble" supply; an ordinary discharge from a lavatory or butler's sink is, however, sufficient to start the siphon when the chamber is full. Stoppers are provided at A and B, so that the siphon and chamber can be cleaned out if required. Other patent siphons, such as Rogers Field's, are designed for use with sewage or clean water, and can be placed in underground chambers constructed of concrete or brick, or in a galvanised iron tank. The construction of Field's flush-tank (fig. 75) is simple. The long leg A of the siphon passes through the bottom of the tank into the trapping-box, B, which is provided with an arm, C, for connexion to the flush-pipe; the dome, D, forming the short leg of the siphon, can be removed for inspection and repair. A handhole is formed at E, so that the trapping-box can be inspected and cleaned. The top of the long leg is so designed that siphonic action is started by a drop-by-drop supply.

The outlets of flush-tanks must be freely ventilated and disconnected from the drains, and all tanks fed with sewage must be periodically cleaned.

A single chamber or tank may be fitted with two siphons so as to flush two drains running in different directions from the same point; the siphons can be arranged to discharge alternately.

The size of the flush-tank must be governed by the diameter, length, and inclination of the drain, the velocity of discharge from the tank, and the nature and normal flow of the sewage. Very few experiments appear to have been made, and, consequently, no definite rule can be laid down. Two tests by Mr. S. H. Adams deserve mention. The drain was 9 in. in diameter, and had a fall of 1 in 200. A discharge of 472 gallons started with an initial velocity of 5 ft. per second; at a distance of 250 ft. the velocity had been reduced to 4 ft. per second; at 650 ft. it was 3 ft., and at 1,600 ft. 2 ft. per second; and this velocity was slightly reduced during a further flow of 2,000 ft. A discharge of 180 gallons into the same drain started with an initial velocity of about 4 ft. 2 in. per second, or nearly 1 ft. per second less than in the other test, and this difference was approximately maintained throughout the length of the drain. If we assume that a velocity of less than 3 ft. per second is of little use, we must conclude that the larger and more rapid discharge was efficacious for a length of about 700 ft., and the smaller for about 300 ft.

House-drains are usually of smaller diameter and quicker gradient, and high velocities can in consequence be maintained for longer distances. Smaller quantities of water will therefore suffice. It is better to place two or more flushing cisterns of smaller capacity at the heads of different branch-drains than one large cistern at the head of the principal branch. It is also better to have two discharges daily from a tank of moderate size than a single discharge from a tank of double the capacity. As a rough and ready approximation, the normal capacity of the flushing-tank in gallons (for house-drains) may be found by squaring the diameter of the drain in inches. Thus, a 4 in. drain may have a flush of 16 gallons, a 5 in. 25 gallons, and a 6-in. 36 gallons. These figures must be increased as the gradients are diminished, and as the length of the drain is increased. Assum-

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ing the proper gradient of a 4-in. drain to be 1 in 34 (see Chapter 6), and that the drain to be flushed has a gradient of 1 in 50, add (50−34 =) 16 gallons to the normal capacity, and similarly for other gradients. Add also one gallon for every 20 ft. length of drain beyond 100 ft.

This gives us the empirical formula—$F = d^2 + (g - g_1) + \frac{l - 100}{20}$, where F = capacity of flushing tank in gallons, d = diameter of drain in inches, g = length of drain divided by the fall, g_1 = length of self-cleansing drain divided by the fall (= 34 for 4-in. drains, 48 for 5-in., and 65 for 6-in.—See Table III., Chapter 6), and l = length of drain in feet.

Required the capacity of the flushing-tank for a 5-in. drain 200 ft. long, laid to a gradient of 1 in 60.

$$F = 5^2 + (60 - 48) + \frac{200 - 100}{20} = 42 \text{ gallons.}$$

If the drains are much too large for their work, greater volumes of flushing water are required. Thus, if a 9-in. drain is laid where a 4-in. drain would suffice, this 9-in. pipe will require more flushing water than a 9-in. sewer in which the normal flow is, say, one-third of the diameter. The flushing water ought to be sufficient, when added to the normal flow, to increase the depth until the highest velocity is attained—that is to say, the pipe must be from half-full to nearly full.

Flushing siphons may be too large. The rapid discharge of large siphons often forces paper and soil from the main into the branch drains, or siphons the water from the gully-traps. We have seen that the velocity is the same whether a drain is flowing full or half full, and as deposits accumulate on the invert and not on the crown, the depth of the flow need not exceed half the diameter of the drain. Of course, the flushing water enters the drain at a high velocity, which is gradually reduced until the normal velocity due to the gradient of the drain is reached. It is impossible to lay down any hard-and-fast rule as to the size of the siphon, but for general purposes the diameter of the outlet-leg ought not be much more than half that of the drain to be flushed. In the case of long outfall drains—which are usually of greater diameter than any of the branches—small tanks may be provided at the heads of the principal branches, and a larger one at some suitable point in the outfall.

Penstocks are sometimes fixed in the manholes of sewers to dam the sewage back; on raising the penstock, the sewage escapes with an increased velocity, and so flushes the sewer below. This method of flushing has obvious disadvantages, and cannot be recommended for house-drains.

Testing.—However carefully the construction of drains may have been supervised there can be no assurance that they are absolutely water-tight and airtight unless a positive test is applied. The Urban and Rural Model By-laws contain no provisions on this subject; they merely state that the joints of drain-pipes must be "watertight," but the onus of proof or disproof appears to rest with the authority, and not with the person who constructs the drain. The London Drainage By-laws are more explicit. The seventh paragraph of By-law 4 states that all drains, except those for the drainage of the subsoil, must be "so constructed as to be watertight and to be capable of resisting a pressure of at least 2 ft. head of water." Opinions differ as to whether this provision renders the water-test compulsory, or whether it allows the pneumatic test, with the same pressure per square inch, to be adopted. In our opinion, the wording is clearly in favour of the former of these two readings: the preposition "of" after "pressure" is not synonymous with "equal to," and the statement of the pressure as "head of water" and not in pounds per square inch leaves, we think, no room for doubt as to the meaning intended to be conveyed. When we remember that in the event of stoppage a drain is subjected to water-pressure, it is clear that a test of the same nature will be more satisfactory than any other.

Drains ought to be tested before they are covered with concrete, so that defects can be easily repaired. Long drains must be tested in sections, so that the head of water in any part does not exceed 8 or 10 ft. Excessive pressure may burst the joints, as the test must obviously be applied long before the cement has attained its ultimate strength. The resistance of neat cement to direct tension will in a few hours be much greater than the water-pressure here recommended, but it is the adhesive rather than the tensile resistance which is called into play, and the smoothness of many drain-pipes prevents the cement adhering firmly in a short time; for this reason, the spigots and sockets of drain-pipes ought to be roughly scored before being burnt. A quick-setting cement allows the water-test to be applied almost as soon as the drain is laid, but such cement may expand in setting and burst off the collars of the pipes. It is better to use a cool slow-setting cement, and to allow as long a time as possible (say, two days) to elapse before the test is applied. Admixture with sand retards the setting of cement, and it is often convenient to use a rich mortar (say 1 part of cement to ½ or ¼ part of sand) in order that the test may be carried out and the trench filled up without loss of time.

To apply the water test, the lower end of the length to be tested must be stopped, usually by means of a drain-plug, and a bend and stand-pipe not less than 2 ft. high must be fixed at the upper end, and the drain must then be filled with water. The water should remain in the drain at least half an hour, and if at the end of this time it retains its original level in the stand-pipe, the drain may be approved. If the level is lowered, the leaks must be discovered, the water drawn off, the joints repaired, and the drain again tested. Manholes ought to be tested in a similar manner, after plugging the drain-pipes and traps. The London by-laws clearly specify that every means of access to a drain must be watertight up to the level of the adjoining ground-surface or roadway.

When a length of drain has been tested with satisfactory results, the concrete covering can be laid, and the water may be allowed to remain in the pipes till this is done. If the level of the water remains constant, no disturbance has taken place, and the filling of the trench can be completed. Where the drains are not covered with concrete, the trench must be filled very carefully, the material being well packed around the pipes. In many cases the test may with advantage be repeated some time after the trenches have been filled, so that defects caused during this operation or by settlement of the foundations may be discovered before the building is occupied.

Drain plugs or stoppers are of two principal kinds—disc-plugs and bag-stoppers. The disc-plug or stopper shown in fig. 76 is known as Jones's patent expanding screw stopper. It consists of two discs of galvanised iron or brass, between which a moulded rubber ring is fixed. By turning the handle in one direction the discs are brought closer together, and the indiarubber is thereby compressed and forced outwards from 1 in. to 3 in., according to the size of the stopper. The illustration shows a centre outlet fitted with an indicator; if the latter is suspended from a fixed point, the slightest leakage in the drain can be detected by observing the gauge. Bag-stoppers are more portable. The bag is cylindrical in shape (fig. 77), and after being placed in the drain is inflated by means of a small air-pump until the required pressure is attained. The escape of air is prevented by turning the tap at A. Bag-stoppers are also made with central outlets, so that part of the testing water can be allowed to escape before the air is released from the bag.

Very long outfall drains without manholes may require one or more access-pipes at convenient places for the insertion of the stopper, so that the drain can be tested in two or more sections. A cross section of Winser's access-pipe for this purpose is given in fig. 78. It has an arched stoneware cover resting in a deep oblong socket. When the test has been applied, the cover is placed in position and entirely covered with cement-mortar. The drain between an intercepting chamber and a sewer can be easily tested if an access-pipe of this kind is laid in the drain near the sewer.

The Smoke Test has been very largely adopted, but is not as certain as the water test. After stopping all openings, pungent smoke is forced into the drain by means of a smoke machine connected with one of the plugs. This method is not without its advantages, but the water test is now generally preferred by sanitarians. Smoke rockets are useful for the preliminary testing of old drains, and may reveal sufficient defects to induce the building owner to decide upon a new system of drainage, but the smoke test, however applied, is not always satisfactory.

The pneumatic test consists in pumping air into the stopped drain until a certain pressure is attained. This pressure is recorded on a gauge, and any reduction after pumping has ceased shows that there is a leak, but the position of the leak cannot be located as easily as with the water test or smoke test. This method has not been generally adopted.

THE ART UNION OF LONDON:

ANNUAL GENERAL MEETING.

THE annual meeting of the members of the Art Union of London was held on Thursday at the Lecture Hall, Society of Arts, Adelphi. Lord Windsor presided, and among those present were Fleet-Surgeon A. T. Corrie, Messrs. T. O. Donaldson, W. Edwards, jun., Fredk. Morris Fry, John Mackrell, J. Biddulph Martin, M.P., and John Sparkes.

The Secretary (Mr. F. C. Marriott) read the sixty-sixth annual report of the Council. Reference was made to the death, since the last annual meeting, of Sir T. Lucas, Mr Augustus Thorne, and Mr. Cosmo Monkhouse; and the Council went on to refer to the year as memorable in the annals of the Society from the importance of its presentation picture, "Victoria Victrix." The etching had not, perhaps, met with that wide appreciation which the interest of the subject had justified the Council in expecting, but they believed that as time went on and the great and solemn events of last year revealed themselves in their true historical perspective, the picture would be valued and sought after not only for its beauty and its accuracy, but also, and the point was worth dwelling upon, as the only published record of its character, of one of the most remarkable pageants in the world's history. Notwithstanding the prolongation of the South African war, the year had been one of somewhat more than average success. After providing for engravings, the Council had been able to devote the sum of 562*l.* to prizes to be drawn for that day, making, with the consolation prizes awarded during the year to unsuccessful members of ten consecutive years' standing, a total of 218 prizes.

Among the works of art specially selected by the Council for prizes are [the Report proceeded] a bronze statuette "Hero," by Miss Margaret Giles; a bronze statuette "Boy at the Stream," after Foley, R.A; six copies in electro silver of a new and original inkstand designed for the Society by Miss K. J. Harris; twenty pomegranate flower-bowls in Doulton ware; six dragon jugs in Copeland ware; six pairs of Doulton vases; twelve Meduza Tazza (electro bronze); six framed electro silver bas-reliefs, "The Descent of Venus," after Etty, R.A. As the subject for the presentation plate of the coming year the Council have selected a painting by Mr. Yeend King, Vice-President of the Royal Institute of Painters in Water Colour, which under the title of the "Fold Yard" was exhibited in the Royal Academy of 1900. . . . The present picture is thoroughly characteristic of the artist's best style, and it has been most sympathetically translated into black and white by Mr. C. O. Murray, R.P.E. . . . The Council have been gratified to learn that under the new Commonwealth tariff, as revised to December 31 last, engravings and etchings are admitted into all the Australian Colonies duty free. It is understood that the tariff may yet undergo some revision; but if, as seems not improbable, this exemption should remain in force, the Society's operations in Australia should receive considerable encouragement. . . .

The Chairman, in moving the adoption of the report, referred with regret to the action of the Canadian Government in enforcing legislation which crippled the laudable operations of the Union in that colony. Not only had the Union been the means of increasing a love for art, but even at the present time, when art was more appreciated than in the earlier part of the last century, new subscribers had become impressed with the value of the Union and felt impelled to replace some of their pictorial decorations with the productions of the Art Union.

Mr. Biddulph Martin, M.P., seconded the motion, which was adopted, and the vice-presidents and members of the Council were re-elected. The prizes were then drawn for.

RESTORATION OF PARISH CHURCH, CLAPHAM.—This building is to be restored. Professor Beresford Pite is the architect, and Messrs. Garrett & Sons the builders.

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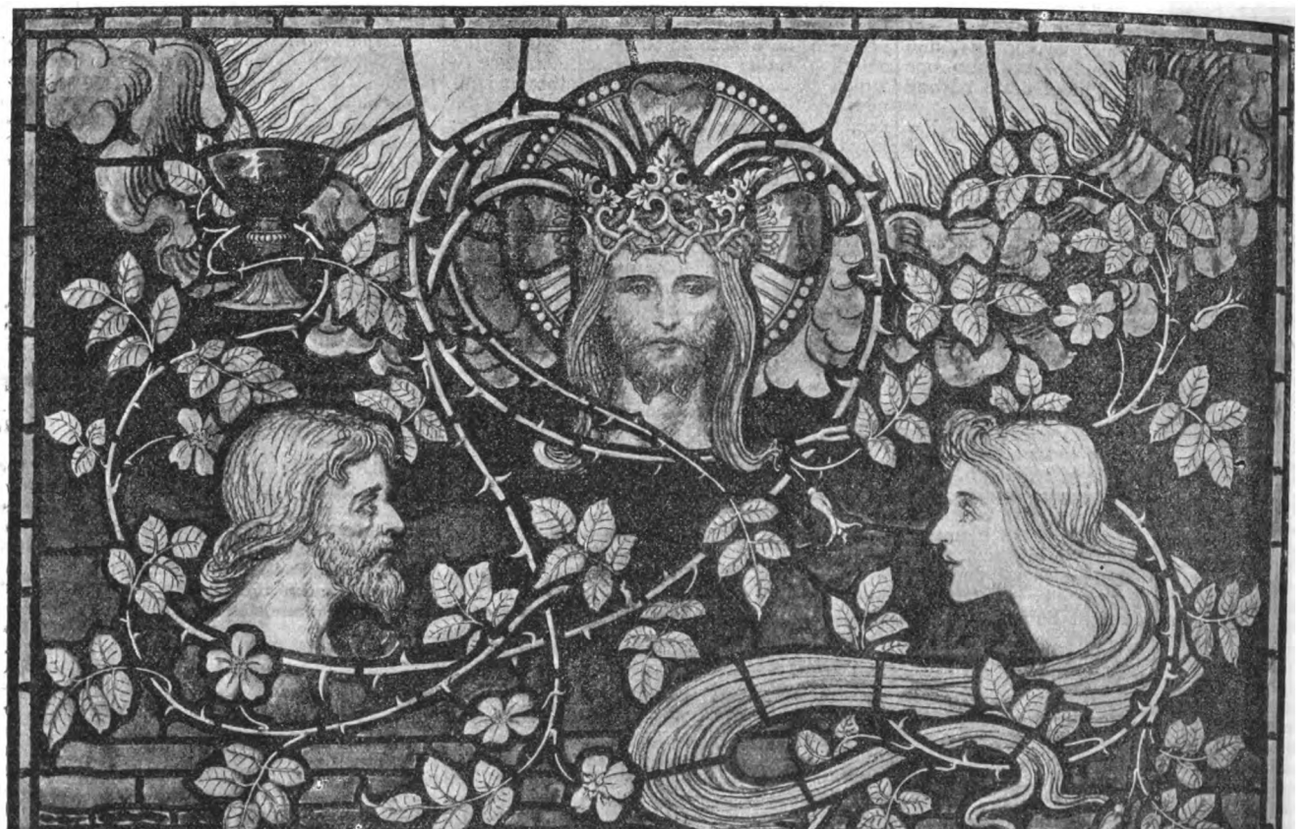

Cartoon for a Stained Glass Panel. By Mr. Silvester Sparrow.

Illustrations.

DESIGN FOR CENTRAL OFFICES AND PUBLIC HALL, THAMES EMBANKMENT.

THIS design was prepared some time since for a large site then vacant at Whitefriars fronting the Embankment, for a combination of offices, warehouses, and printing works, with a great public hall for religious meetings. The buildings were arranged with a central mass to emphasise that they formed grouped departments of one organisation the importance of which was to be expressed both in the building and the site. Surrounding rights of light indicated the advisability of setting back the upper stories, internal areas were provided and smoke and ventilating shafts were grouped in the central tower.

BERESFORD PITE.

DESIGN FOR STAINED GLASS.

WE give this week two designs for stained glass by Mr. Silvester Sparrow; one being shown in one of our lithograph plates, and the other in the engraving on this page.

The window shown in the lithograph was designed and made by the artist for the parish church of Lledrod, near Aberystwith. The subject is "Christ the Sower—the Angels Reaping"; the whole subject being suggested by the text "He that soweth the good seed is the Son of Man, and the reapers are the angels."

The other illustration is from a coloured cartoon for a stained-glass panel. The idea intended to be expressed in it is that the love of Christ, typified by the flower of Love springing from the sacrificial crown of thorns, draws all Humanity to itself.

Our readers will recognise, we think, both in the designs and in the feeling which it is sought to express in them, something quite distinct from the ordinary commonplaces of stained glass windows.

OFFICES IN MOORGATE-STREET.

THE building represented is the first portion of a scheme for the rebuilding of the head offices of The Ocean Accident and Guarantee Corporation, Limited, and is so arranged as to be used in conjunction with the existing offices pending execution of the remainder. The ground on which this portion is erected being under separate tenure, there were also conditions to be dealt with requiring the building to be so designed as to be adaptable for separate holding and occupation, and complete in itself for that purpose.

The illustration shows the front in Moorgate-street. There is another frontage in Moorgate-place, at the rear, and a public passage-way, at the street level, passes under the building from one street to the other. Portland stone and gauged red brick have been used for the fronts, with dark Norwegian granite base. The passage-way is faced and vaulted with white glazed bricks, Portland stone dressings, and the granite base continued through; the roofs and turret are covered with Westmoreland slating. The lantern, and finishings to turret, also the clock-casing and supports, are executed in copper.

The general contract is being carried out by Messrs. Dove Bros., the copper work has been executed by Messrs. Ewart & Son, and the carving by Mr. Gilbert Seale. Mr. W. H. Atkin Berry, of the firm of Messrs. Kidner & Berry, is the architect. The drawing was in the Royal Academy last year.

EXPRESS DAIRY CO.'S PREMISES, LUDGATE-HILL.

THIS building, which was erected from the designs of Messrs. Young & Hall, has a frontage of 17 ft. 6 in., and a depth of building about 67 ft. The basement contains a smoking-room the entire length of the main building, with a small scullery and boiler-house behind. The ground floor and first floor are luncheon and tea rooms; the second floor private rooms, with lavatory accommodation; and the third floor contains the kitchen, scullery, storerooms, &c. The front of the building is entirely of Doulting stone, the walls of the basement are lined entirely with glazed tiles, and the ground and first floor with faience ware made by Messrs. Whitehead & Co.

The general builders were Messrs. L. H. & R. Roberts; the heating was carried out by Messrs. Kinnell, the lifts by the B. and S. Folding Gate Co., the fireproof floors by Messrs. Fawcett, and the electric lighting by Messrs. Coleby.

DESIGN FOR PROPOSED CLUB AT WEMBLEY.

THIS clubhouse was designed by Mr. Frank H. Jackson, architect, to be the social meeting-place of the estate residents—ladies and gentlemen—with a drawing-room and dining-room for the former, dining-room, billiard and smoking rooms for the latter, and at the rear a large ballroom or concert-hall, with music gallery and conservatory, for general or private use.

The first floor is divided into two parts—bedrooms for ladies and gentlemen, who may be friends of the members.

Provision for steward's offices, &c., arranged.

VILLA RESIDENCES, SHANGHAI.

THESE houses were designed by Messrs. Kingsmill & Atkinson, English architects practising at Shanghai.

The architects sent us no description of the work or materials, merely the plans and a photograph; but they may be of interest as an example of domestic architecture in one of our colonies.

THE PARISH CHURCH, LYNG.—The Vicar of Lyng, Somersetshire, asks for contributions to a fund for the restoration of the parish church of St. Bartholomew, at an estimated cost of 1,500*l*. The church, formerly a "capella" of the abbey, comprises a nave with north and south porches, and a fine west window, a chancel, and a western embattled tower 60 ft. high. The masonry, flooring, and roofing have greatly decayed. The Benedictine Abbey was founded and dedicated to our Saviour and St. Peter by King Alfred as a memorial of his retreat in the Isle of Athelney, which is situated, at the junction of the rivers Tone and Parret, within the parish of Lyng. The abbey church, rebuilt in 1321, possessed an annual revenue estimated at 209*l*. at the time of its surrender by Robert Hamlyn, the last Abbot. A fund has been raised for the reparation of the monument erected on the site of the abbey at Athelney Hill. In the vicinity, at Newton Park, was found, in 1693, the "King Alfred's Jewel," now preserved in the Ashmolean Museum, Oxford.

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APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Kensington, South.—That the resolution reported to the Council on January 21, 1902, with reference to the erection of a block of residential flats on the site of Nos. 13, 15, 17, 19, and 21, Abingdon Villas, Kensington, be varied by the addition after the words "not to build to a height exceeding 16 ft. on the plot of land coloured green on the said plans" of the words "such height being however exclusive of lantern lights not exceeding in area one-half the area of the corridor to be erected on the said plot and not exceeding in height 3 ft.—Agreed.

Lines of Frontage and Projections.

Norwood.—Houses on the northern side of St. Louis-road, Auckland Hill, West Norwood, between St. Bernard's-road and St. Gothard's-road (Mr. R. Pippette).—Consent.

Clapham.—Buildings, with one-story shops in front, on the site of Nos. 222, 224, 226, and 228, Lavender Hill, Battersea (Mr. E. H. Henry for the trustees of the late M. Whiting).—Consent.

Kensington, South.—An addition, to be used as a larder, on part of the forecourt of No. 23, Victoria-road, Kensington (Messrs. Holdstock & Mould for Mrs. B. E. L. Porter).—Consent.

Brixton.—Houses, with shops on the ground floor, on the north-west side of Coldharbour-lane, Camberwell, between Nos. 76 and 84 (Mr. E. E. Bird for Mr. E. Bird).—Consent.

Dulwich.—A three-story building, with projecting one-story addition, on the west side of Lordship-lane, East Dulwich, at the corner of Ashbourne-grove (Messrs. R. C. Harrison & Son for the London Joint Stock Bank, Limited).—Consent.

Hampstead.—A bay window in front of No. 20, Ferncroft-avenue, Platt's-lane, Hampstead (Mr. C. H. Quennell for Mr. G. W. Hart).—Consent.

Lewisham.—An addition to a one-story building at the rear of No. 184, Brownhill-road, Catford, abutting upon St. Fillans-road (Mr. H. Amey).—Consent.

Lewisham.—Two one-story shops on part of the forecourt of a house known as "The Acacias," on the west side of High-street, Rushey-green, Lewisham (Mr. C. Farley for Mr. W. Howell).—Consent.

Lewisham.—Porticoes at the entrances to Nos. 30 and 32, Leyland-road, Lee (Mr. E. Petters for Mr. R. B. A. Chambers).—Consent.

Lewisham.—A wood and glass porch at the entrance to the Swiss Cottage public-house, Stanstead-road, Forest Hill (Messrs. Watney, Combe, Reid, & Co., Ltd.).—Consent.

Marylebone, East.—Projections to a block of buildings to be erected on the site of Nos. 164 to 182, Oxford-street, such projections to consist of twenty balconies at the first-floor level, balcony railings on the main cornice at the fifth-floor level, &c. (Mr. R. F. Atkinson for Mr. S. J. Waring, junior).—Consent.

Strand.—Oriel windows in front of an office building to be erected on the site of Nos. 62, 63, 64 and 65, Charing Cross, Strand (Mr. G. R. Julian for the Canadian Pacific Railway Company).—Consent.

Strand.—A building on the site of Nos. 27 and 28, Pall-mall, and Nos. 24 and 25, St. James's-square, St. James's, with projecting piers and balconies (Mr. F. E. Williams for the Wilkinson Sword Company).—Consent.

Strand.—A balcony, at the first floor level, in front of No. 24, Pall-mall, St. James's (Mr. A. C. Forrester for Messrs. Hoby & Gullick).—Consent.

Clapham.—That the Council do make no order with respect to the application of Mr. F. Eaton for consent to the erection of a dwelling-house on the southern side of Abbeville-road, Clapham, to abut upon Crescent-lane.—Agreed.

Battersea.—A one-story addition at the rear of No. 80, St. John's-road, Battersea, to abut upon Allewal-road (Mr. W. H. Boney for Messrs. H. Roland & Co.).—Refused.

Hackney, Central.—A one-story addition at the flank of No. 1, Church-road, De Beauvoir Town, Kingsland, to abut upon De Beauvoir-road (Mr. T. G. Woods).—Refused.

Hampstead.—A three-story bay window in front of No. 31, Steeles-road, Hampstead (Mr. C. J. Strachan for Mr. W. T. Pearce).—Refused.

Hampstead.—Erection of iron and glass covered-ways in front of the porches at Nos. 50, 62, 64, and 70, Belsize-park-gardens, and No. 6, Belsize-grove, South Hampstead (Mr. T. H. Pankhurst).—Refused.

Lewisham.—One-story shops on part of the forecourts of Nos. 120 and 122, Sydenham-road, Lower Sydenham (Mr. F. Theobalds for Mr. W. Cooper).—Refused.

Kensington, South.—A building on the eastern side of Warwick-road, South Kensington (Mr. W. A. Large for Messrs. Bishops & Son).—Refused.

Kensington, South.—A wood and iron sign in front of No. 11, Church-street, Kensington (Messrs. L. Cockerell & Son for Mr. S. Keightley).—Refused.

Marylebone, East.—Stone piers to the boundary railings and an addition to the porch of St. Cyprian's Church, Glentworth-street, Upper Park-place, St. Marylebone (Messrs. W. Bucknall and J. N. Comper). Refused.

Walworth.—The retention of a wooden hood over the entrance in York-street to the Walworth Working Men's Club, Walworth-road, Newington (Messrs. Spalding & Spalding).—Refused.

Woolwich.—A one-story addition in front of the Edinburgh Castle public-house, No. 110, Samuel-street, Woolwich (Mr. J. Rowland for Mr. A. R. Neale).—Refused.

Width of Way.

Bethnal Green, South-west.—A building, to be used as a fermenting-house, on the south side of Bath-street, Bethnal Green, at the corner of Lisbon-street (Messrs. W. Bradford & Sons for Messrs. Mann, Crossman, & Paulin).—Consent.

Bow and Bromley.—Re-erection of a building, used as offices and a lodge, on the south side of Three Mill-lane, Bromley-by-Bow (Messrs. Wigg, Oliver, Hudson & Co. for Messrs. Kemball, Bishop & Co., Ltd.)—Consent.

Hackney, Central.—A two-story building at the rear of Nos. 2 and 4, De Beauvoir-road, Hackney (Messrs. A. Weibking & Co., Ltd., for Mr. W. Peck)—Consent.

Wandsworth.—A one-story building at the rear of Nos. 255 and 257, Upper Richmond-road, Putney (Messrs. Bartlett & Ross for Mr. G. S. Hearn).—Consent.

Poplar.—A one-story shed and a one-story office building at the East India Docks, Poplar (Mr. T. Hardy for the London and East India Dock Company).—Refused.

Chelsea.—A one-story smoking room addition at the rear of No. 50, Cadogan-place, Chelsea (Mr. J. D. Coleridge for Mr. R. Ward).—Refused.

Dulwich.—A one-story stable building with the external walls at less than the prescribed distance from the respective centres of the roadways of two streets leading from Troy-town to Peckham-rye, Peckham (Mr. W. L. Dowton for Mr. R. W. Atkinson).—Refused.

Haggerston.—Buildings, to be used as stables and workshops, on the east side of Ivy-lane, Hoxton (Mr. S. Skrimshire for Mr. E. T. Pearce).—Refused.

Lambeth, North.†—Buildings on the sites of Nos. 8, 9, 10 and 11, College-street, Belvedere-road, Lambeth (Mr. C. A. Sharp for Messrs. H. Smith & Son).—Refused.

Kensington, North.—Conversion of Nos. 61, 63, and 65, Chepstow-place, Kensington, into one building (Messrs. Coles & Co. for Mr. W. J. R. Vezey).—Consent.

Whitechapel.—A building on the east side of Vallance-road, Whitechapel, at the corner of Durward-street (Mr. T. G. Charlton for Mr. J. Warschawsky)—Refused.

Deviations from Certified Plans.

Strand.—Deviations from the plans certified by the district surveyor, so far as relates to the proposed erection of a block of buildings on the site of Nos. 70 and 71, Jermyn-street, and No. 25, Bury-street, St. James's (Mr. R. Morphew for Mr. G. F. Harrington).—Consent.

City.—Deviations from the plan certified by the district surveyor so far as relates to the proposed rebuilding of the stable premises at the rear of buildings on the north side of Hutton-street, and the east side of Primrose Hill, City (Mr. H. A. Satchell for Messrs. E. Lloyd).—Consent.

Width of Way, Lines of Frontage, and Projections.

Strand.†—An angle tower, six oriel windows, and balconies to a proposed block of buildings on the south-east side of Jermyn-street, St. James's, at the corner of Bury-street (Mr. R. Morphew for Mr. G. F. Harrington).—Consent.

Woolwich.—The rebuilding of No. 59, Wellington-street, and No. 1, Brewer-street, Woolwich (Mr. H. P. Monckton for Captain R. A. Ogilby and Mr. W. E. Champion).—Consent.

Hackney, North.—Two blocks of three-story flats on the west side of Church-path, Stoke Newington, at the rear of Nos. 68 to 74, Albion-road (Mr. A. P. Osment).—Consent.

Islington, East.—No order with respect to the application of Messrs. Wagstaff & Sons on behalf of Mr. F. Courthorpe, for consent to the erection of a studio and workshop building at the rear of No. 59, Highbury-park, Islington.—Agreed.

Chelsea.—An iron and glass shelter at the entrance to No. 16, Hans-place, Chelsea (Messrs. Gaslake & Co.).—Refused.

Marylebone, East.—A three-story addition, partly on the site of a porch, at No. 22, Sussex-place, Regent's Park (Mr. J. Emblin-Walker for Mr. H. B. Ripley).—Refused.

Line of Frontage and Space at Rear.

Hammersmith.†—A block of residential flats on the north side of Blythe-road, Hammersmith (Mr. G. H. Fox for Mr. T. Pocklington).—Consent.

Width of Way, Line of Frontage, and Space at Rear.

Fulham.—A building on the southern side of Edith-villas and the northern side of Conan-street, Fulham (Mr. W. Cave)—Refused.

Line of Frontage and Construction.

Islington, West.—Retention of a wooden sign-board on the south-west side of Holloway-road, Islington, on the site of the proposed Marlborough Theatre (Mr. F. Matcham for Mr. F. W. Purcell).—Consent.

Hammersmith.—A wood and iron vestibule at the side entrance to No. 69, Brook-green, Hammersmith, to abut upon Caithness-road (Mr. J. McManus for Dr. Denne)—Refused.

Buildings for the Supply of Electricity.

Marylebone, East.—The steelwork of an electricity generating station in course of erection on a site on the east side of Grove-road, Marylebone, between the Regent's Canal and Lodge-place (Mr. C. S. Peach for the Central Electric Supply Co.)—Refused.

Means of Escape from High Buildings.

Kensington, South.—Means of escape in case of fire, proposed to be provided on the eighth and ninth stories of a block of residential flats known as Block 1, Iverna-court, situate on the west side of Wright's-lane and south side of Iverna-gardens, Kensington (Messrs. Metcalfe & Greig).—Refused.

*** *The recommendations marked † are contrary to the views of the local authorities.*

BOOKS RECEIVED.

THE COUNTRY GENTLEMEN'S ESTATE BOOK. Edited and compiled by W. Broomhall. (The Country Gentlemen's Association.)

Correspondence.

THE BARBICAN FIRE.

SIR,—The attention of the Executive of this Committee having been given to the Barbican fire of Monday last, which in many ways is a repetition of the worst features of the Cripplegate conflagration of 1897, we think it only right on this occasion to call the attention of the warehousemen and ground landlords, as well as the Public Authorities controlling these areas and the insurance companies, who have considerable influence on building matters, that neglect is being shown, even in the better class of warehouse buildings, to the protection of the vertical surface occupied by the window openings overlooking thoroughfares, areas, and courts, and that it is imperative that such openings in the vertical surfaces should be protected in some form or other. This protection can be effected by using less inflammable materials for window-frames (in many cases by using fire-resisting glazing), and further, by fitting the openings with fire-resisting shutters or blinds, or by equiping them with drenchers.

It is obvious that in the metropolis the risk of fire spreading from house to house, across streets even over 40 ft. wide (as in the case of the Barbican fire), should be limited by preventive measures, which, although not inexpensive, become absolute necessities in localities where the householder's danger is not a question merely of accident or neglect in his own premises, but where he has to be constantly on his guard against risk from his neighbours.

With more rapid measures, automatic or otherwise, of summoning the Fire Brigade forces and the instant use of first-aid fire-extinguishing appliances, the possibilities of extensive conflagrations would be more remote, and much that this committee must now consider necessary in the form of better building construction might perhaps be modified. But given existing circumstances, the importance of fire prevention by better construction, and more particularly by a reduction of the spread of fire from house to house, is becoming even more essential, now that the City population is decreasing whilst mercantile structures are rapidly taking the place of dwellings.

We take the occasion to emphasise only the one serious question of the protection of vertical openings, although there are many other points which deserve attention, more particularly the protection of all ironwork by suitable covering; the avoidance of building materials which, when heated by fire, are liable to disintegrate on the application of water; improved forms of roof construction, and the protection of sky-lights. But to deal in detail with these would lead too far. We desire to point out that under the present circumstances of the Metropolis, the prevention of the spread of fire from neighbouring property is of far greater importance than in many other cities, and that means exist by which this risk can be reduced.

EDWIN O. SACHS, Chairman.
ELLIS MARSLAND, Hon. Secretary.
On behalf of the
British Fire Prevention Committee.

MR. CARÖE ON ANCIENT BUILDINGS.

SIR,—I am not an architect, but I am a little of an antiquary, and a great admirer of our ancient churches. For several years I have been engaged in the study of all the village churches of one of the

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Midland counties, and have already examined between seventy and eighty of them. My experience enables me to appreciate in particular Mr. Caröe's remarks on the way in which such buildings should be treated. It was refreshing to find him saying that it would be a gain to our churches "if we could only get five-sixths of the modern stained-glass windows throughout the world bestoned." I have discovered that many of these windows are simply illustrations of personal vanity cheaply expressed in very bad taste. It was also refreshing to find Mr. Caröe, and Mr. Webb after him, condemning the modern abuse of the organ. In our village churches the new organ is often structurally an eyesore despite—in part, because of—its paint and gilding. As a musical instrument it is, in many cases, too powerful for the congregation. It frequently stands upon, or is built against and covers, fine ancient brasses, or obscures some good and much-needed window. It would also be well if Mr. Caröe and his brother architects could persuade the parish authorities to preserve their churches "from the garish tile floor, the meretricious brass lectern, and all the blatant brasswork," &c. I need scarcely add that I thoroughly appreciate the general attitude of Mr. Caröe towards our ancient village churches, and that I only wish the whole of the architects who are called in to advise upon questions of "restoration" were equally anxious to avoid "marring the beauty of an ancient building by inharmonious accessories."

I may be allowed to mention—*à propos* of Mr. Caröe's mention of the church of Westwell, near Ashford—that the *Ampelopsis Veitchii* is used most effectively at Thurleigh Church, Beds. There being a central tower, the west window of the nave is an unusually large one—four lights, divided by transoms, and fine Perpendicular tracery above. The plant is allowed to grow over the window, with the result that in winter, when the sun is low, the light is not obstructed, while in summer and autumn the western sun shines in through beautiful tracery of, first, green leaves, then of variously tinted crimson and scarlet leaves. A. R.

*** In regard to our correspondent's remarks on the size of organs, we may observe that such criticisms are generally made by those who know nothing about organs or church music, and who think appearances are everything in a church and music nothing. Except in a very small church—a mere chapel—a small organ is absolutely useless for any proper accompaniment of congregational singing. The object should be, not to reduce the size of the organ, but to treat the case in an artistic manner.—ED.

CAUDEBEC-EN-CAUX.

SIR,—Some words of yours, uttered many years ago, in regard to stone tracery, have always remained in my memory: "Put plenty of joints, or they will come of themselves." The recollection of this well-turned phrase has had a salutary influence in my own case when settling the jointing of stonework, and I only wish, Sir, that you would exert your influence with the present generation of architectural students in the hope of securing greater attention to this very important point when sketching and measuring old work.

The otherwise excellent drawing by Mr. C. Wontner Smith of a doorhead in the great church at Caudebec, in your issue of the 12th inst., suffers materially from neglect in this respect.

On comparing it with a drawing made by me in 1882, I find the jointing of the spandrels quite forgotten, with the result that the drawing is rendered comparatively insipid to anyone imbued with a feeling for Gothic methods of construction.

May I also reiterate what you, Sir, have so constantly impressed upon students — the supreme necessity for a scale on all measured drawings.

I wonder if any of your readers, who are not familiar with the charming old town of Caudebec, realise that the exquisite traceried compartments above the hood-mould measure only 3⅜ in. from centre to centre, and that the doorway itself is but 2 ft. 4½ in. wide.

Mr. Smith, by the way, might have completed his already interesting drawing by showing also the door itself with its beautiful square-headed traceried panels. GEORGE HORNBLOWER.

NEW MALDEN MUNICIPAL BUILDINGS COMPETITION.

SIR,—I think "Acetylene" will find on enquiry that the fees quoted by the five architects referred to were for *assessing* the competition. Newspaper reporters have a fine disregard for little distinctions of this kind. A. SAXON SNELL.

* * We may point out, however, that even in that case the system of writing to various architects to ask what they will charge for acting as assessor is a most objectionable one, and is highly disapproved of by the Institute of Architects.—ED.

EPSOM GRAND STAND.—A new lift has been constructed in connection with the King's private apartments at the Grand Stand at Epsom racecourse; the first time we believe, that the convenience of a lift has been added to a structure of this class in England. The lift was made and fitted by Messrs. A. Smith & Stevens.

OBITUARY.

M. DALOU.—We greatly regret to have to record the death of M. Jules Dalou, one of the greatest sculptors of our time, at the comparatively early age of 63, as the result of a long and painful heart disease. Born of humble parents of the artisan class, Dalou had studied successively under Abel de Pujol, Duret, and Carpeaux. He entered the Ecole des Beaux-Arts in 1853, and made his first appearance at the Salon in 1861, with a statuette, "Dame Romaine Jouant aux Osselets" In 1870 his plaster statue, "Brodeuse," attracted attention. Having accepted during the Commune a post in the Louvre Museum—where he assisted in preserving its contents from injury—he was obliged to fly in 1871, and took refuge in England, where, thanks to the Duke of Westminster's influence, he obtained a professional position at South Kensington. After the armistice he returned to France, and in 1879 took part in the competition for the monument, "Triomphe de la République," proposed to be erected on the Place de la République. His admirable sketch design failed to convince the jury, who gave the preference to another design; but the Municipal Council of Paris somewhat repaired that injustice by commissioning Dalou to carry out his design on the Place de la Nation, where it was completed and formally inaugurated in 1899. Two or three illustrations of it, from different points of view, have appeared in the *Builder* at different times, the best being that which appeared in our issue of December 9, 1899, from a photograph taken just after the work had been completed. Among Dalou's other works may be mentioned the alto-relief in the French Chamber of Deputies, representing Mirabeau's altercation with de Brézé; the "Triumph of Silenus," which is now in the garden of the Luxembourg; the vigorous and remarkable monument to Delacroix, also in the Luxembourg garden; the monuments to Victor Noir and to Blanqui, in Père Lachaise Cemetery; the monument to Alphand, in the Avenue de Bois de Boulogne; the fine bas-relief "A la Gloire de la République," purchased by the Paris Municipality and which will be placed in the Petit Palais; the "Mére allaitant son Enfant" a terra-cotta exhibited at the Royal Academy, where it attracted great attention as a sculptural treatment of a domestic subject; and numerous busts all characterised by an admirable intensity of character and expression. Dalou, who was a "Commandeur" in the Legion of Honour, was also one of the founders of the Société Nationale des Beaux-Arts (the "New Salon"), along with Meissonier and Puvis de Chavannes; and at the time when his illness obliged him to cease working, he was completing the monument to Gambetta which was to be inaugurated at Bordeaux. A further comment on the qualities of his art will be found in our Note on page 413.

GENERAL BUILDING NEWS.

INCHINNAN PARISH CHURCH, RENFREWSHIRE.—Inchinnan Parish Church, was re-opened for public worship on the 12th inst. The renovation of the church is being carried out at, it is stated, a cost of between 15,000*l.* and 20,000*l.* Dr. Rowand Anderson, of Edinburgh, was entrusted with the work of carrying out the scheme. The portion of the building which was opened on the 12th inst. consists of a choir 22 ft. in length, a central tower 22 ft. square internally, north and south transepts, and a vestry, with organ chamber above. The nave is to occupy the present site of the old church, and its reconstruction will be gone on with immediately. The central tower when completed will rise, including its open crown termination, to a height of 125 ft. The choir contains a five-light window in the gable, filled with stained glass, while there is also a two-light window in the south wall. Each of the transepts has also been fitted with three-light windows in the gables. Angle buttresses appear at all the corners. The ceilings of the choir and transepts are pointed in sections and divided into compartments by moulded ribs. The choir floor is laid with black and white marble, and the floors of the transepts with smaller squares of stone, filled in with oak block flooring. The walls are lined up to the height of 5 ft. from the floor with oak veneer.

HALL, UNITED FREE CHURCH, SCOTSTOUN, RENFREWSHIRE.—A new United Free Church Hall has been erected at Scotstoun. In view of the future erection of a church, the new hall is placed at the northern end of the site. The front gable faces the street, and has a large three-light window with traceried head lighting the end of the hall. The entrance porch is placed at the side, with a moulded doorway leading into an inner vestibule. Seating is provided for over 400 persons, and there is accessory accommodation in vestry, session-house, kitchen, &c. The total cost will be about 2,000*l.* The building has been erected from the designs of Mr. J. B. Wilson, Glasgow: the principal contractors being Messrs. W. Gordon & Co. for mason work, and Mr. Thos. Brown for wright work.

CHURCH, READING.—The opening of Caversham-road Church, Reading, took place on the 9th inst. The building is Perpendicular in style, and built both externally and internally with red brick with stone dressings. There is a nave with end gallery, divided from the aisles by an arcading of stone columns. The pulpit, communion-table, and choir-stalls are in carved oak, with an organ, built by Messrs. Bishop & Son, behind and detached from the pulpit. The architect was Mr. W. G Lewton, of Reading. The total cost, including organ and electric lighting, is about 5,500*l.*, for a church seated for 516 people.

MISSION CHURCH, PENTONVILLE.—A new mission-room has been erected at the rear of 90 and 91, White Lion-street, Pentonville. The new building, with its gymnasium crypt, has been designed by Mr. R. A. Briggs, of Norfolk-street, Strand. The walls externally are faced with red brick, the windows and doorways having dressings in bath stone.

WESLEYAN SCHOOLS, BASFORD, STAFFORDSHIRE.—The Basford Wesleyan School Chapel, erected as a preliminary to the church, schools, and minister's house, was opened recently. The entire scheme comprises school, manse to be erected in twelve months, and the church in several years. Mr. W. F. Slater, of Burslem, whose plans were accepted in competition, is the architect. The building has been erected by Mr. J. H. Broadhurst, builder, Burslem, for 1,255*l.*, and heating arrangements are by Messrs. W. Truswell & Son, of Newcastle-under-Lyme, and the wrought ironwork by Mr. Durose, of Tunstall.

PROPOSED CHURCH, HANDSWORTH, BIRMINGHAM.—It is stated that the anonymous donor of a site in the Handsworth New-road, Birmingham, for a church, parsonage, and Sunday schools, has now added to this gift by promising to build the church outright, subject to certain conditions. The preparation of the plans has been entrusted to Mr. Bidlake.

WESLEYAN CHAPEL, CASTLE TOWN, DURHAM.—The dedication services of the Victoria Memorial Wesleyan Chapel, Castle Town, on the north side of the Wear, took place on the 19th inst. The new building, which is of brick, with freestone dressing is situate in the Hylton Castle-road. The style adopted is Gothic. The sitting accommodation is for 250, and the heating is by hot water. The architect is Mr. G. G. Kirkby, of Sunderland, and the work has been carried out by Mr. R. M. Storey, of West Boldon, the contractor.

PRIMITIVE METHODIST CHAPEL, BRADFORD.—The foundation-stones of the new Primitive Methodist Chapel which is being erected at Daisy Hill, Bradford, were laid on the 19th inst. The new chapel will be constructed of local stone, the style being Gothic. The principal dimensions will be as follow: Length 75 ft., width 42 ft. (inside measurement), frontage 56 ft., and front elevation 50 ft. The front will face Smith-lane, looking towards Bradford, and at one corner there will be a small stone tower surmounted by a lead-covered spire. There are to be vestries for minister and choir, and a classroom or church parlour, and the building will also have a horseshoe gallery and an organ chamber, the latter situated behind the pulpit. The roof will be of open timber work, and the internal fittings will be of stained and varnished pitch pine, while the windows will be filled with leaded cathedral glass. Seating accommodation will be provided for about 500 persons. It is estimated that the building will cost about 2,000*l.* The architect is Mr. T. E. Davidson, of London, whose plans were chosen in competition.

CHURCH, NELSON, LANCASHIRE.—The new St. Philip's Church, Nelson, has just been consecrated. The site is situated in Leeds-road, between St. Philip's-street and Wycliffe-street, the entrance gates being at the two street corners. The style is Early English. All the inside fittings are of pitch pine. The tower will contain belfry, ringing chamber, and cloakroom. It will rise to a height of 90 ft., and will be surmounted by a small spirelet and flagstaff. A baptistry has been formed, and the interior of the nave and aisles are divided into four bays. The choir and clergy vestries are arranged with separate entrances, and in the form of a transept on the south, which corresponds with a similar one opposite for the organ. With respect to the chancel floor, it is of marble mosaic in various colours. The passages, the nave, and aisles are of red tiles, with ornamental borders. The pulpit is situated on the north side. It is of effective design. The font, in the centre of the west wall, stands upon a platform of Catlow stone. The plans were prepared by Mr. R. Basnett Preston, of Manchester.

SCHOOLS, HIGH FELLING, DURHAM.—The Falla Park-road Schools, recently built by the Heworth School Board at High Felling, were opened on the 14th inst. The buildings are in two separate blocks, one being a junior and the other an infants' school, accommodating 320 and 260 children respectively. The site contains two acres, and space is reserved at the southern portion for the erection at some future time of a mixed school. The schools are built on the central-hall principle, with classrooms grouped around, together with cloakrooms, and rooms for teachers. A caretaker's house of five rooms has been constructed at the south-west corner of the site, and is in electric communication with the teachers' rooms in the school buildings. The whole of the buildings externally are faced with Sherburn bricks, and internally up to the

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window level with Normanby glazed bricks. The architect is Mr. H. Miller (Felling), and the contractor Mr. J. W. Braithwaite (Heaton).

BOARD SCHOOL, GATESHEAD.—A school for about 750 is now in course of erection at Kelvin-grove, Gateshead, and a junior department for more than 300 scholars has just been opened for the reception of scholars at Victoria-road. The new school is a one-story building (intended for children in the lower standards), consisting of six classrooms and a large central hall. Separate entrances and cloakrooms are provided for boys and girls, and the central hall is 40 ft. by 26 ft., having a hammer-beam roof, the timbers being dressed and varnished. Four classrooms accommodate sixty each, and two are for forty. The work has been carried out from the plans of Mr. W. H Dunn, who designed the original buildings. Mr. Thos. Hunter, of Washington, was the contractor. The sub-contractors were Mr. Thos. Rule, plastering; Mr. Chas. Nicholson, slating; and Messrs. Allinson & Son, plumbing. The hot-water apparatus was supplied by Messrs. Richardson & Co., of Darlington.

SCHOOL, ATHERTON, LANCASHIRE.—A new infant school has been erected at Howe Bridge, Atherton. It has been erected on a site adjoining the old schools. The new school is of one story, and provides accommodation for nearly 300 children. It consists of a large schoolroom, a babies' room, and two classrooms, to all of which access is obtained from a central corridor. Some alterations have also been made in the old school. Mr. Isaac Taylor, of Manchester, was the architect for the new building.

CHURCH DAY SCHOOLS, WINLATON, DURHAM.—The Winlaton Church Elementary Schools were opened on the 5th inst. The schools, designed by Mr. J. H. Morton, of South Shields, and built by Mrs. M. A. Armstrong, contractor, Blaydon Bank, are situate at the junction of West-lane and Scotland Head. The structure consists of one room, 70 ft. by 22 ft., and divided in the centre by sliding partitions, making one compartment for eighty girls and another for eighty boys. Alongside of this is a classroom affording accommodation for fifty children, and also an infants' school providing accommodation for 100 scholars. At each end are separate cloakrooms—one for boys and the other for girls. The building is heated with low-pressure hot-water pipes and radiators. The large room is so arranged as to be suitable for parochial purposes also. The school is a stone building.

BANK, DUNFERMLINE.—New bank buildings for the Clydesdale Bank, Limited, are to be erected in High-street, Dunfermline. The ground floor is to be used as offices for the Bank, and immediately above will be chambers. The new buildings will have a frontage of 40 ft. to High-street. Messrs. Baird & Thomson, Glasgow, are the architects.

PRESBYTERIAN ASSEMBLY BUILDINGS, BELFAST.—The site of the Fisherwick-place Church, recently demolished, has been acquired, and upon it a new Assembly buildings is to be erected for the Presbyterian Church in Ireland. The structure and site will cost some 60,000*l*. Messrs. Young & Mackenzie are the architects.

THE CAMPBELL HOSPITAL FOR BANFFSHIRE.—The Building Committee of the board of the Joint Hospital for Infectious Diseases for Lower Banffshire, to whom was remitted at the board's first meeting consideration of the plans for the Campbell Hospital, met at Portsoy on the 15th inst. Plans prepared by Mr. Kelly, architect, Aberdeen, were laid before the committee. After the necessary approval has been given, the architect was authorised to proceed with the preparation of the working plans and specifications, and to advertise for tenders to be submitted to the Building Committee, and then to the Joint Hospital Board.

BUILDING SCHEME, WHITLEY, NORTHUMBERLAND.—Preparations are being made to commence building operations on what is called the Whitley Links Building Estate. The land is on the north side of the village, and is really in Monkseaton. It is proposed to build 500 houses, all of which will be self-contained. In the centre of the estate a 40 ft. street, running from west to east, is to be made. In a line with the street is to be a bandstand. Other streets running north and south will have a 25 ft. carriageway and shrubberies on either side. These are to be named after south-country watering places, such as Ventnor-gardens, Ilfracombe-gardens, Bournemouth-gardens, and the like. Messrs. Hope & Maxwell are the architects.

PROPOSED NEW READING ROOMS, PUBLIC LIBRARY, ABERDEEN.—The report by the Building Sub-Committee recommends the adoption of the plan by Messrs. Brown & Watt, architects, for the new central reading room at the library, showing a new reading room with an area of 4,350 square feet, a reading room for ladies on the upper floor, with an area of 3,450 square feet, and an addition to the reference department of 600 square feet. The estimated cost is 5,300*l*., apart from furniture, outside stone balustrade, and the cost of heating and ventilation. The estimated cost of the branch reading room at Torry, for which the same architects are preparing plans, is 1,500*l*.

NEW WAREHOUSES, MANCHESTER.—The contract for a new refrigerating warehouse in Miller-street, Manchester, has been let to Messrs. R. Neill & Sons, contractors, Manchester. The building is eleven-storied and contains all the usual requirements for cold storage. It belongs to the Colonial Consignment and Distributing Company, London, of which Sir E. Montague Nelson is chairman. The elevations of this new building are composed of red brick and buff terra-cotta. The various contracts in connection with the erection of a new iron storing-warehouse, Trafford Park, Manchester, for Messrs. Hall & Pickles (of Manchester), have just been let. The building covers about 8,000 square yards, and is mostly a steel-work erection. The building, which is a store for iron girders, joists, bars, rods, &c., faces on to the Ship Canal Docks, and has railway facilities into the building itself. The architects of both buildings are Messrs. Chas. Heathcote & Sons, Manchester.

BAPTIST SCHOOLROOM, BALHAM.—A new schoolroom in connexion with Ramsden-road Baptist Church, Balham, was opened recently. The building is 45 ft. wide by 52 ft. long, is capable of accommodating between 400 and 500 persons, is heated on the low-pressure hot-air system, is lighted artificially with gas and incandescent burners, and has been erected at a cost of, including fittings, about 2,000*l*. by Mr. Walter Wallis, from the plans of Messrs. W. E. Johnson and H. J. Capell, the joint architects. There are four exits, two retiring-rooms, and a platform.

MUNICIPAL BUILDINGS, CLYDEBANK.—The Clydebank Municipal Buildings, which have just been completed, are situated on the south side of Dumbarton-road. The various departments are comprised in two separate blocks, the larger of the two covering an area of 224 0 by 122.0, with two frontages, and including the Burgh Offices, Town Hall, and Lesser Hall, Library and Reading-room, Burgh Court-room, Police-station and office, and police-inspector's house. The main entrance to Burgh offices is placed in the centre of the Dumbarton-road front, which leads to the entrance hall and staircase. The following offices are embraced in the area—namely, Town-clerk's offices, Fiscal's-room, Rates-offices, and sanitary department. On the upper floor is placed the council chamber. The west part of upper floor includes committee-rooms, Provost's room, and Master of Works' offices. To the east of Dumbarton-road front an entrance leads to the Burgh Court-room, which measures 34 ft. by 22, which has adjoining rooms for male and female witnesses, with lavatory conveniences; and at the end of the courtroom is the magistrates' retiring-room. On side street a separate entrance leads to the lesser hall, which accommodates between 400 and 500 people. The position of the lesser hall is such that it can be used as a refreshment-room in connexion with the great hall. The great hall is 100 ft. long and 50 wide, exclusive of recess at gallery, and accommodates about 1,500 people. The roof is elliptical in shape, formed with ribs and panels. A feature in the hall are galleries which are entirely supported on cantilevers, no supporting columns being used, and the entire floor is thus left perfectly free of obstruction A wide corridor runs the entire length of one side of the hall, into which the various exit doors open. Cloakrooms are provided for ladies and gentlemen, which are available for both the smaller and great hall. The police cells—thirteen in number—are all finished internally with white enamelled brick. On the opposite side of the road are placed the public baths, fire station, and firemen's houses. The baths combine a swimming bath, 50 ft. by 25 ft., and male and female slipper baths. The fire station has stable and tower for fire hose, engine-room, &c. The buildings are heated on the plenum system. The buildings are lighted by electricity throughout from a generating plant situated in the basement of the building. Externally the building is treated in the Renaissance style, the leading feature being a tower rising to a height of 120 ft., and surmounted by a bronze-winged figure emblematic of Progress. On the tympanum and front gables are placed groups of statuary emblematic of Commerce and Engineering, and over the main doorway is placed the arms of the burgh. The work was designed and carried out under the superintendence of Mr. James Miller, architect, Glasgow.

BUSINESS PREMISES, NORWICH.—Messrs. Curl Brothers, Limited, have just opened new premises which have been erected for them in Orford-place, at the back of their Rampant Horse-street building, by Messrs. Searles Bros., from plans prepared by Messrs. E. Boardman & Son. The extension consists of basement, ground floor, and first and second floors, all communicating by pitch-pine staircases with the corresponding floors of the Rampant Horse-street block.

SCHOOL ENLARGEMENT, MARSDEN, YORKSHIRE.—The foundation-stones have just been laid of an enlargement of the Town's school at Marsden. The architect is Mr. J. E. Lunn, of Milnsbridge. The building will accommodate 400 children.

THEATRES, HALIFAX.—A new theatre, to be called the Alexandra Theatre, is about to be erected by the Northern Theatres Co., Ltd., and is, in effect, a reconstruction and enlargement of the present old Riding School. The building will consist, on the ground-floor of orchestra-stalls, pit-stalls, and pit; on the next tier is the dress-circle, and above that there will be amphitheatre and gallery. The total seating accommodation is for 1,000, while the standing-room provided will hold another 500. Every portion of the house has separate entry and double exits. Each tier has saloon, crush-room, and lavatories. The main entrance is from Commercial-street, at the St. John's-lane end. The architects are Messrs. Jackson and Fox, of Halifax. ——A company has been formed to acquire a freehold site on the Wards End Estate, and to erect thereon the new Palace Theatre with a number of shops and suites of offices over. The theatre will be erected from plans prepared by Messrs. Ernest Runtz & Co., which have been approved by the Improvement Committee of the Halifax Town Council. It will be erected at a cost something like 20,000*l*., and will have seating capacity for 2,000.

ADDITION TO LADIES' COLLEGE, EDINBURGH.—At the Edinburgh Dean of Guild Court, on the 10th inst., the Governors of George Watson's Hospital were granted a warrant to build a new wing to George Watson's Ladies' College in George-square. The new wing of the school, when completed, will form a special department for the teaching of technical, scientific, and artistic subjects, and will be specially fitted up with work tables, sludge sinks, fume closets, stills, furnaces, and Bunsen burners, and will have all sorts of apparatus for experiments in mechanics, heat, electricity, magnetism, acoustics, optics, &c. The present dwelling-house, No. 3, George-square, will be demolished to make room for the new wing, which will be four stories in height, the three upper floors being devoted to physics, chemistry, and drawing respectively. The ground or basement floor will be devoted to a large luncheon and recreation room. The plans have been prepared by Mr. Peter L. Henderson, architect, Edinburgh.

BUSINESS PREMISES, CLIFTON.—On the 14th inst. the new buildings which Lennards, Ltd., have built at Queen's-road, Clifton, were inaugurated. The area of the new buildings is practically half an acre, and the floor space occupied by the company is roughly an acre and a half. On the lower level, or basement, are placed the firm's stables, packing, receiving, and delivery rooms, with two electric goods lifts communicating with the floors above; adjoining are cellars, portions being occupied by heating plant, and other parts for use with shops over, with lavatories to each lined with white glazed bricks. At the junction of Triangle West and the new road to be known as Lennards'-road are the staircase and entrance for the workmen, of fireproof construction, and near by the hauling way to the courtyard. The company's own retail shop on the ground floor has a frontage of 72 ft. to the Queen's-road, and is 19 ft. high. Arches divide the shop from the ladies' fitting-room, which has three stained glass windows, containing the arms of some of the principal cities and towns in which the company have branches. The floors are of marble mosaic, and ladies' and gentlemen's lavatories are provided for the use of the customers. At the junction of Park-place and Queen's-road, under the tower, is the principal entrance to the offices and depot of the company. The entrance vestibule is paved and lined with marble and vaulted, and leads to the staircase, executed in Spanish mahogany and East Indian teak. On the first floor are the company's offices, board-room, and the private room of the managing director. The rest of this floor is devoted to the storage of stock, as also is the entire area of the second and third floors. The whole of the building, including those portions to be let, is lighted by electricity, and warmed by low-pressure steam. The piers on the ground floor and plinths are of polished red granite, and the whole of the facades towards Queen's-road, Triangle, and Park-place are faced with freestone. The architect was Mr. H. Dare Bryan. Mr. T. Cawsey has acted as clerk of works from the commencement.

POST OFFICE, RICHMOND, YORKSHIRE. — The foundation stone of the new post office at Richmond has just been laid. The building will be of two stories, comprising the post office, dwelling-house, and private offices and shop. The post office will be at the corner, and will include a large sorting room, 40 ft. by 20 ft. Mr. Bruce, of Newcastle, is the architect, and the builder Mr. G. R. Wade, of Richmond.

VOLUNTEER RIFLE BRIGADE PREMISES, EDINBURGH — New buildings for the Queen's Rifle Volunteer Brigade are to be erected in Edinburgh. The old premises will be taken down and new buildings erected, containing on the ground floor an armoury with workshop, stores, stabling for service wagons, the orderly and the adjutant's room. The first floor, the officers' quarters, rooms for company meetings, medical inspection room, and a gymnasium. The second floor is given over to the non-commissioned officers and to the men, for whom are provided mess, billiard, recreation, and reading-rooms, with service-rooms and lifts to kitchen, which is placed on the top floor. The third floor contains a lecture-hall seated for 320 persons, with retiring-rooms, &c., a band-room, and accommodation for the quartermaster's stores, the caretaker's house being on the attic floor. The buildings have been designed in the Scottish Baronial style. The plans have been prepared by Messrs. Cooper & Taylor, architects, Edinburgh.

MEDICAL INSTITUTE, BELFAST.—On the 12th inst. the foundation-stone was laid of the proposed new Medical Institute for Belfast, in College-square North. The building will be entered

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by an outer and inner porch leading to a reception hall, which is divided from the library by a stone arcade filled in with glazed folding doors. These rooms cover the front portion of the ground floor, at the back of which is the staircase and private consulting-rooms, with the usual accessories. The first floor is occupied by the lecture hall, above which, on the top floor, is a billiard-room, librarian's quarters, kitchen, serving-rooms, &c. The front of the building facing College-square North consists of Scrabo rock-faced ashlar and Dumfries red sandstone dressings, and presents a frontage of 45 ft. to the street, by about 46 ft. high to the top of the parapet, with a gable in the centre. The work has been entrusted to Messrs. M'Laughlin & Harvey, builders, who are carrying it out under the supervision of the architect, Mr. William J. Fennell, of Belfast.

ASYLUM, SCALEBOR PARK, BURLEY-IN-WHARFEDALE, YORKSHIRE.—The West Riding County Council are erecting at Scalebor Park a new lunatic asylum for the accommodation of private patients. The main buildings, which will cover in all an area of about 6½ acres, are constructed somewhat in the shape of the letter E, with two additional projections at the rear, comprising the acute blocks. The front entrance, leading to the administrative block, has a large porch, with glass roof and circular frame, which will be transformed into a kind of conservatory. The entrance-hall — 32 ft. by 20 ft. 9 in.—and connecting corridors, which are laid with mosaic pavement, are flanked on each side with doctors' offices, waiting-room, receiving-room, assistant medical officers' messroom, dispensary, porter's room, and telephone office. On the right is the principal staircase to the first floor, on which are the assistant medical officers' parlour, board-room, and corridor, from which open bedrooms and bathrooms. The main building in the rear is connected with the entrance block by a main connecting glass corridor, so arranged that any part of the building can be reached without going out of doors. Running at right angles to this main connecting corridor is another corridor, joining the infirm and acute blocks. Parallel with it is a recreation hall, 78 ft. long by 36 ft. wide, at one end of which a stage and music gallery will be fitted up, with two dressing-rooms in the basement. From the main corridor there are side corridors—168 ft. long—at right angles, from which access is gained to the dining-room, kitchen, stores — 47 ft. by 20 ft.—and nurses' messroom on the ground floor, and dining-hall, housekeepers' pantry, attendants' quarters, bathroom, lavatories, &c., on the first floor. The recreation hall is continued to the roof. The sick and infirm blocks and the acute blocks for males and females are practically identical, the only difference being that on the female side there is a large recreation hall—47 ft. 6 in. by 22 ft. 6 in.—with large bay windows, whilst on the men's side a similar space is used as a smoke and billiard room. On each side of the entrance to the sick and infirm blocks are sitting-rooms, 19 ft. by 18 ft. Parallel with the front runs a large corridor—from which branch smaller corridors—106 ft. long, by means of which the rooms in these blocks are approached. There is a dining-hall—24 ft. by 30 ft.—four bedrooms, with bathrooms and other conveniences. Over the sitting-rooms on the first floor are two dormitories, and smaller bedrooms over the remainder of the building, with the exception of the recreation hall. The second floor is almost a replica of the first, the rooms being utilised for nurses' quarters. The acute blocks are approached by similar corridors to those already described. There is an entrance at each end, between which are three sitting-rooms 25 ft. by 20 ft. Behind these is a main corridor, 192 ft. long, in which are recesses or "ingle nooks," 15 ft. by 6 ft. At right-angles with the main corridor runs a shorter one—120 ft. long—along the side of which are the dining-hall—20 ft. by 18 ft. — and a conservatory 18 ft. by 14 ft. The second floor is almost identical with the first, with the exception that bedrooms are substituted for the dining-hall, and on the second floor there is the usual accommodation for attendants. The whole of the building is of stone from local quarries. It has been designed by Mr. J. Vickers Edwards, West Riding County Surveyor. The contractor for the principal blocks is Mr. Isaac Gould, of Leeds. One or two minor works have been carried out by other firms. The laundry construction has been in the hands of Messrs. Obank & Sons, Idle, whilst the machinery has been supplied by Messrs. W. Summerscales & Sons, Ltd., Keighley. The ventilation has been carried out by Messrs. Ashwell & Nesbitt, Leicester. The lighting will be by electricity, generated on the premises. The floors in the administrative block and the whole of the entrance-halls are in mosaic pavement, the recreation-hall is laid with maple boards, and the other floors in pitch-pine boards. Most of the joiners' work in the administrative block is of pitch-pine, and in the other blocks of red wood. The outer doors are also of the latter material, and the inner doors of white wood. The whole of the roofs are of red tiles. The doctor's residence, situate at some little distance from the main building, is on the north-east side. The building operations have been superintended by Mr. G. W. France, Burley, who has acted as clerk of the works.

INFIRMARY, SHIRLEY WARREN, HANTS.—A new infirmary, erected by the Southampton Incorporation, was opened on the 15th inst. The new infirmary buildings consist of the following groups of buildings: entrance lodge, nurses' home, observation block for questionable cases, the administrative blocks, maternity block, two female sick pavilions, three male sick pavilions, cottages for engineer and steward, and the laundry, boiler-house, stable, mortuary, and workshop group. The sick pavilions are connected to the administrative blocks with covered ways. The total number of beds provided for is 300, about sixty to each pavilion, but should circumstances require it the number can be added to by the erection of another or more pavilions, the administrative portions of the infirmary being built on a scale to admit of this. Each pavilion is a two-story building, and the whole five contain wards of varying sizes, from twenty-four beds to three beds each. Each pavilion is provided with two staircases, and wide balconies for convalescents' use. On the floor of each pavilion offices have been provided as follows:—Ward kitchen, with sink, range, larder, &c., bathroom, lavatory, with station for bath on wheels for patients unable to use bathroom, linen-room, day-room for convalescents, slop-sink-room, and the usual sanitary accommodation, the latter being in detached sanitary towers, approached from main buildings by means of enclosed bridges. The pavilion halls are provided with lifts for food, coal, &c., and they and the corridors are heated by hot-water coils, and the wards with central down draught hot-air ventilating stoves with large open fires. The walls throughout are finished with adamant plastering painted. All corners of rooms, ceilings, and floors are rounded. The maternity block has provision for eight beds on one floor. The administrative department contains accommodation for the committee of management, the medical superintendent, the assistant medical officer, the matron, chaplain, porter, and servants generally, kitchen department, with larders, messrooms, &c. Steward's department, with large general store (two story), nurses' dining and cloak rooms, matron's office, store, and sewing-room, dispensary, anæsthetic operating-rooms, reception wards, and clothes stores for male and female patients, &c. The Nurses' Home is a detached three-story building, and gives accommodation for about thirty nurses, probationers, &c.; it provides a small bedroom for each nurse, and contains, in addition, a general sitting-room, lecture-room, assistant matron's bed and sitting-room, small kitchen, bathrooms, &c. The home is not intended to provide dining accommodation, as all meals will be taken in the dining-rooms provided, adjacent to the kitchen of the main buildings. The laundry has been fitted with machinery for washing purposes by Messrs. Bradford & Co., and all the engineering work in connexion with the heating, hot-water services, steam and gas cooking, &c., has been executed by Messrs. Haden & Sons, Trowbridge. The buildings throughout, as well as the roads, are lighted by electricity. The electric plant was designed by Mr. J. G. W. Aldridge, of Southampton, and put in by Messrs. Lankester & Sons, Limited. The general contractor for the whole of the work, exclusive of electric lighting and the laying out of the grounds, but inclusive of the engineering and laundry work, was Mr. H. Cawte, of Shirley. The architects were Messrs. Mitchell & Gutteridge, of Southampton.

SCHOOLS, BARROW-IN-FURNESS.—At a meeting of the Barrow-in-Furness School Board, held on Tuesday, the 22nd inst., tenders were accepted from local builders for the enlargement of the Cambridge-street Schools, Barrow. The work comprises taking down an existing schoolroom and boys' cloakroom, and erecting a central hall, 65 ft. long by 31 ft. wide, three classrooms, boys' cloakrooms, and Head Master's room, and the asphalting of the boys' and girls' playgrounds. The total amount of the accepted tenders was 2,488*l.* 6*s.* 6*d.* The architect is Mr. Henry T. Fowler, Barrow.

FOREIGN.

FRANCE.—M. Henri Guillaume, the architect, has been commissioned to design the monument to be raised to Gavarni. It will be a very simple design, comprising a stele surmounted by a bust of the celebrated caricaturist by M. Denys Puech, who is also to execute, at the base, the figure of a woman in a carnival dress. The monument is to be erected in the centre of the basin of the Place St. Georges.——M. L. Salomon, engineer-in-chief to the "De l'Est" Railway Company, has been elected President of the Société des Ingénieurs Civils, in place of the late M. Mesureur.——The Government has authorised the installation of the Musée des Colonies in the shops which border the Galerie d'Orléans, Palais Royal.——The Municipality of Lilas have opened a competition for the transformation of the Place Paul de Kock into a public square, and for the construction of a school building and a Salle des Fêtes.——A monument to Voltaire is to be inaugurated at Châtenay on May 1. Mme. Syamour is the sculptor and M. Soudée the architect.——The first stone has been laid of a new Hôtel de Ville at Creil.——The municipality of Puy has devoted a sum of 171,000 fr. to the construction of a Practical School of Commerce and Industry.——An interesting historical exhibition of wood-engraving is to be organised shortly at the Ecole des Beaux-Arts. This will open on May 3, and will include a historic section ("section ancienne") for the French, Dutch, and German schools, and a modern section embracing the whole work of the nineteenth century. There will be a special section for Japan.——A new church is to be commenced in Paris in the Quartier des Quinze-Vingt, at an estimated cost of 500 000 fr. ——The sixty-ninth Archæological Congress of France will be held this year at Troyes, from June 24 to July 2.——The death is announced, at the age of fifty-four, of M. Bousquet, Architect to the Prefecture of Police and Inspector of Works under the Government.——M. Didron, artist in stained glass, has died at Paris at the age of sixty-five. He was an able and learned artist whose work was much appreciated by architects, and he has carried out important works for the Commission des Monuments Historiques in various churches of Paris, notably St. Germain l'Auxerrois, St. Merri, St. Séverin, St. Louis d'Antin, and St. Thomas d'Aquin.

RUSSIA.—The Minister of Finance has sanctioned a sum of 30,000 roubles for the purpose of the proposed Panslavist Art and Industrial Exhibition, to be opened in St. Petersburg in February, 1903. Practically the whole of the Slav countries have agreed to do their best to make this art exhibition a success, and Bulgaria is taking particular interest in it.——In order to dispense with the transport of trains across Lake Baikal by steamer, the Russian Government contemplates deviating the line east of Irkutsk, so that it passes to the south of that lake and approaches nearer the Chinese frontier, subsequently joining the eastern extension to Vladivostock. The country is of a mountainous character, and the cost of construction of that part of the Great Siberian railroad is estimated to be much greater per verst that on any other section.

GERMANY.—The Italian Ambassador to the Court of Berlin has recently visited the studio of Gustav Eberlein, a sculptor who has been commissioned by the Emperor William to undertake the Goethe monument which his Majesty will give to the city of Rome. The model, which has been executed, represents Goethe as a youth during his first visit to Rome, in the picturesque Empire costume, with knee-breeches, &c. The monument will be of Carrara marble, and will be over 20 ft. in height. The pedestal will be decorated with three groups, representing Mignon and the old Harper as symbols of lyric poetry; Orestes flogged by the furies as a symbol of tragedy; and Faust and Mephistopheles as the symbols of philosophy.

INDIA.—One of the features of the durbar at Delhi in connexion with the Coronation is a large art exhibition, for the purpose of which four lakhs of rupees have been voted.——Extensive additions are about to be made to the medical college at Calcutta, at a cost of two lakhs of rupees.——The North-Western railway are about to construct new quarters for its staff on the Nowshera-Darai branch in consequence of increased traffic.——The Government of India contemplates laying a railway and telegraph to the Persian frontier through Beluchistan. This will be one of the most important railway works of recent years.——A bill has been introduced in the Legislative Council of the Straits Settlements for the construction of tramways in Singapore.——New quarters for the naval commander-in-chief are to be erected in Bombay.

UNITED STATES.—A Bill is to be brought before the New York legislature to establish rules for the construction, ventilation, and sanitation of schoolhouses and other public buildings, similar to those which have for several years been enforced in Massachusetts. The Bill provides for 15 cubic ft. of fresh air per minute for each pupil in schoolrooms. In this connexion it may be observed that no architect in Massachusetts may now plan school buildings without first being certain that State inspectors will sanction his arrangements for the position of adequate ventilators. The inspector comes armed with an anemometer.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. W. G. Wilson, architect, has removed his offices from 10, Staple-inn to 24, Hart-street, Bloomsbury-square, having taken over in addition to his own practice, that of Mr. Edmund M. Bowyer, architect and surveyor.——Mr. Delissa Joseph, architect, has removed his offices from 17 and 18, Basinghall-street to Portland House, Basinghall-street, E.C.——Mr. H. W. Rising, architect, has removed his offices from Oswaldestre House, Norfolk-street, Strand, to 30, Great James-street, Bedford-row, W.C.

REFUSE DESTRUCTOR, TAUNTON.—The foundation stone of a Horsfall refuse destructor, which is to be erected near the site of the sewage disposal works at Priory, Taunton, was laid on the 22nd inst. The total cost of the work is 5,250*l.*, exclusive of the site. The contract has been secured by Mr. E. H. Page, A.M.Inst.C.E., and it will be carried out under the supervision of Mr. F. L. Watson, A.M.Inst.C.E., secretary and general manager of the Horsfall Destructor Company, Leeds.

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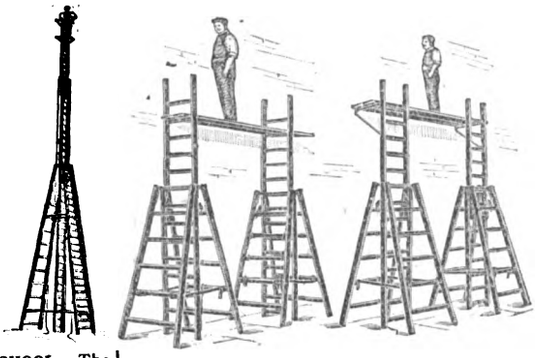
TEMPORARY SCAFFOLDING.—Occasionally there is work to do upon a ceiling for which it would be a heavy item in the job to erect the old-fashioned scaffolding, and therefore we call attention to Mr. Heathman's latest improvement illustrated herewith. These take all apart and close compactly as well as adjust at various heights, and the ladders and trestles can be used separately. A set supplied for reaching 50 ft. at the Hackney Empire Theatre and another for reaching 30 ft. at the Bow Vestry Hall have proved extremely useful, and Mr. Heathman is making a set for the Great Central Hotel at Marylebone.



CRYSTAL PALACE ENGINEERING SCHOOL.—The "Wilson" premium for the best paper read before the Crystal Palace Engineering Society during the present session has been awarded by the Council to G. de Havilland for his paper on "Motor-Cars." Other papers read during the session were "Milling Machines," by H. M. Stephenson; "Ventilation," by G. R. de Peyrecave; "Modern Locomotive Practice," by E. S. Pink; and "Modern English Battleships," by C. S. Dowell. The premium was presented to Mr. de Havilland by the Hon. Sir John Cockburn, K.C.M.G., late Agent-General for South Australia, on the occasion of the eigthy-eighth distribution of certificates at the school on April 18.

THE FLAME ARC LAMP.—On the invitation of the Union Electric Co., of Queen Victoria-street, we had an opportunity last week of inspecting the "Flame Arc" lamp, which is said to have a very high efficiency compared to ordinary arc lamps. The special features of this lamp are the length of the arc, which is in the centre of a miniature reverberatory furnace formed by a fire-clay reflector, and the quality of the carbons used, which are cored with certain salts. The light given out by the lamp is of a pleasant yellowish-white quality, and the general illumination produced very satisfactory. On merely reading the claims put forward for this lamp we were inclined to think that its efficiency was exaggerated. With ordinary arc lamps, the harder the carbons the higher the temperature of the ends, and hence the better the illumination. Cored carbons are not only more expensive, but they are also less efficient than solid carbons. In this lamp, however, the loss due to the cores is apparently made up by the increased temperature maintained by the reflector, which gets coated with a brilliant white powder formed by the burning of special carbons, and hence always maintains its efficiency. Also, the small diameter of the carbons used, and the great length of the arc, prevents the lower carbon intercepting much of the light emitted from the top carbon. It seems to us that this lamp is a distinct novelty; it has many of the advantages of an enclosed arc without the necessity of two globes, and the consequent loss by absorption, and in addition the quality of the light emitted is much pleasanter.

STOURHEAD, WILTSHIRE.—The fire that broke out on April 16 at this mansion, the seat at Stourton of Sir Henry Hoare, Baronet, consumed the main block, with nearly all of the valuable collection of sculpture, though fortunately most of the other works of art, and the pictures, gathered mainly by the second baronet, have been saved. The central portion of the house was built in 1722-3, after designs in the Italian style by Colin Campbell (see his "Vitruvius Britannicus," Vol. iii.), near the site of Stourton Castle, for Henry Hoare, of Fleet-street, the goldsmith and banker, who, 1720, had bought that estate from Thomas, thirteenth Baron Stourton, whose ancestors had been settled there from the time, it is said, of the Norman Conquest. For Sir Henry Hoare (*obiit* 1841) Charles Parker added the two wings, and the tetrastyle portico with engaged Composite columns and pediment to the south and principal front; the latter addition completed Colin Campbell's original design for the main building. In Six Wells Valley, in the park, stands the old "St. Peter's Pump," or Well of St. Edith, removed thither from St. Peter's-street, Bristol, in 1765, by Sir Richard Hoare, the first baronet. Seven years ago Sir Henry Hoare caused to be restored, under Mr. C. E. Ponting's superintendence, and re-erected in the grounds, the old Bristol High Cross, built in 1373. The Cross was removed in 1733 to College Green, Bristol, where it remained until in 1763 it was pulled to pieces; in 1768 the stones were given to Sir Henry Hoare by the Dean of Bristol.

TRURO CATHEDRAL.—The Building Committee of Truro Cathedral met on the 16th inst. for the further consideration of the report of Sir Thomas Drew on the cracks which have developed in the nave piers of the cathedral. Sir Thomas Drew, in his report, which was dated January 14, said that he had no adverse criticism of the designer of the piers. He could not say, however, that he personally accepted the view that the modern methods of rigid and inelastic constructions, the fine jointing in laying stone, was an advance upon ancient practice. The cause of disaster obviously, to him, arose from the modern specification as to mortar and bedding observed with a precision which was quite unusual in less conscientious builders. Beds of piers in old work were usually laid in a comparatively thick bed of mortar, not too good, which lent itself to a certain elasticity. At Truro the mortar was to be theoretically perfect as a cohesive cement, and the jointing theoretically perfect. The result was that the several drums of the columns became so perfectly adhesive that the pier became practically a monolith, with the attendant risk of undistributed pressure all coming on a single bed under the plinth. The provision of a damp course of asphalte added to the evil. Although it might be urged that, as there had been no spreading of the first fractures, the base stones had found their bearing and might remain, he would not take the responsibility of advising such inaction. It was possible that at some time or another some disturbance might affect the true plumb in the press, and the least shift of pressure on the fractured bases might mean disaster. He therefore recommended that the fractured stones be taken out and replaced with sound stones of a harder kind than the Bath stone used in the original construction. The rubble foundation should be lowered to admit of a level copestone of strong concrete. The committee resolved, in view of the fact that cracks have not increased in nine months, in spite of heavy weights being placed upon them, to defer the removal of the base of the piers.

INCORPORATED CHURCH BUILDING SOCIETY.—This Society held its usual monthly meeting on the 17th inst., at the Society's house, 7, Dean's-yard, Westminster, the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz., building new churches at Landore, St. Paul, near Morriston, Glamorgan, 300*l.*; and Rock Ferry, St. Barnabas, near Birkenhead, 125*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Fishponds St. Mary, near Bristol, 40*l.*; Greethan, All Saints, near Horncastle, Lincs., 35*l.*; Landwater Parish Church, near High Wycombe, Bucks, 50*l.*; Sourton, St. Thomas à Becket, near Bridestowe, Devon, 10*l.*; and Ponder's End, St. Matthew, Middlesex, 50*l.*, in lieu of a former grant of 20*l.* The following grants were also paid for works completed:—Wold Newton, All Saints, near Hunmanby, Yorks, 20*l.*; Upper Gravenhurst, St. Giles, near Ampthill, Beds., 25*l.*; and Ocklynge, St. Michael and All Angels, Eastbourne, 100*l.* In addition to this the sum of 170*l.* was paid towards the repairs of twenty-two churches from Trust Funds held by the Society.

HASLEMERE BUILDERS, LTD.—The new building works of the "Haslemere Builders, Ltd.," which have been erected on the site of the old works which were destroyed by fire in December last, were formally opened on Saturday afternoon last in the presence of a large company. This firm of builders and contractors has for the last ten years been carried on by Mr. Herbert Hutchinson partially as a profit-sharing concern, but at the commencement of the present year "The Haslemere Builders, Ltd.," was started to acquire and carry on the business on entirely co-partnership lines, Mr. Hutchinson allowing his capital to remain in the society as shares and loan stock until it is replaced by shares or loans from the employees or others. The workmen themselves have invested about 700*l.* in the new society, and they have elected two representatives on the committee of management. Ten per cent. of the annual profits of the firm is to be devoted to the provident and education funds, and of the remainder, one-third is for the holders of the capital sunk in the business, one-third for the employees and one-third for management. No member of the Society must hold more than 200 *l.* shares. The new works comprise offices, clerks' and private reception-rooms, cashier's-box, and show-room, and, upstairs, the committee-room, a large joiners' shop (to accommodate fifty workmen at one time), large drying sheds (to hold fifty standard of deal), plumbers' and painters' shops, "messroom," and various storehouses. There is also the machine-room containing nearly all new machinery (supplied by Messrs. Kirchner & Co., of London). The Rev. G. B. Stallworthy, of Hindhead, gave an address at the opening ceremony, in the course of which he insisted upon good work being done, and characterised it a crime to build a house badly. Mrs. Herbert Hutchinson (wife of the Founder and President of the Society) then formally declared the works open, wishing the undertaking every success, and set the new machinery in motion. In the evening there was a public meeting, at which Mr. Anewin Williams (President of the Labour Association) gave an address upon co-partnership principles, alluding to the hold that the co-operative movement had obtained in the country. Mr. G. H. Clapshaw, one of the foremen, then spoke a few words expressing the appreciation of the men for what Mr. Hutchinson had done for them, and on their behalf asked his acceptance of an illuminated address which they had subscribed together to obtain. Mr. W. Houghton is manager of the firm, and Mr F. W. Cox secretary. The works and registered office are in Station-road, Haslemere, and the brickworks at Shothermill.

LAND REVENUES OF THE CROWN.—The Report for the twelve months ended March 31, 1901, of the Commissioners of his Majesty's Woods, Forests, and Land Revenues, which has just been issued, sets forth that a sum of 173,700*l.* was expended in the purchase of two Crown leases and some freehold properties in London, and a sum of 190,170*l.* has been paid in purchasing the Tintern and Raglan estates from the Duke of Beaufort. The total annual rental (arrears included) arising from Crown properties amounts to 498,899*l.*, an increase of 16,959*l.* as compared with the total for the preceding period.

GOVERNMENT OFFICES, LONDON.—Two votes in the Civil Service Estimates for 1902-3 provide for the allocation of a sum of 5,000*l.* in respect of alterations, the supply of new furniture, and cost of removal at the rooms which are now occupied by the Exchequer and Audit Department, in favour of the Inland Revenue Department, Somerset House, and of a sum of 4,400*l.* for fitting up new offices on the Victoria Embankment for the Audit Office. It appears, then, that the authorities have relinquished their original project of transferring the Audit Office staff to the quarters now occupied by the Privy Council Office and the Board of Education, at Whitehall, when the latter remove into the buildings being erected on the Parliament and King streets site.

CITY OF LONDON DIRECTORY.—We have received from Messrs. W. H. & L. Collingridge (*City Press Office*) the City of London Directory for 1902, being the thirty-second annual edition. It is a large and handsomely got-up volume, containing all the information that such a directory can give in regard to official lists, schools, trades, &c. The streets section has been revised, and the whole of the occupiers whose names appear therein have been canvassed; while the alphabetical list contains the name, address, and trade or profession of every person, and, as far as can be ascertained, of each individual member of firms in the City of London. The trades guide is classified under the various trades or professions, and contains many new headings. The section relating to the public buildings of the City contains details as to the history and structure of the bridges, and the better known of the City churches; and a brief account of some of the halls of the livery companies. The street improvements of the year are indicated in a large coloured map, and include the alterations in Finsbury-pavement, London-wall, St. Mary-axe, and other streets in the City. It would however be an improvement if, in the "General Contents" list, the number of the page for each section were added.

ATMOSPHERE OF THE HOUSES OF PARLIAMENT.—In the House of Commons on the 18th inst., Dr. Farquharson asked the First Commissioner of Works whether he could inform the House of the result of the recent examination of its air; and whether he would apply the same scientific test to the atmosphere of other public buildings, such as the Central Criminal Court and the British Museum Library. Mr. Akers-Douglas: The tests of the air in this Chamber show a very good result as regards the amount of carbonic acid, which was only 5·2 volumes in 10,000, very little in excess of the quantity usually met with in the air of cities, and far less than what is generally present in places of assembly. The bacteriological test revealed an undue number of micro-organisms, but none of them are found to be disease-producing. The full reports by Dr. Thorpe, the principal of the Government laboratory, will be laid before the Select Committee on the Ventilation of the House; and I propose that further experiments shall be made in order to discover the cause of the presence of so many microbes, with a view to taking suitable measures of improvement. I will consider the hon. member's suggestion as to other Government buildings, but the Central Criminal Court is not in any way under my control.

HOUSES FOR THE WORKING CLASSES, WHITLEY, YORKSHIRE.—An inquiry was held at the Board School, Grange Moor, Huddersfield, recently, by Major C. E. Norton, R.E., an inspector under the Local Government Board, into an application by the Whitley Upper Urban District Council for sanction to borrow 1,240*l.* for the erection of houses for the working classes, under part 3 of the Housing of the Working Classes Act, 1890. Mr. Greaves, who appeared for the District Council, said the population was 764. During the past fifty years only ten houses had been erected, so that it would be seen that the majority were very old. There was a total number of cottages of 117, and out of that number there were seven with no bedroom accommodation whatever; in fifty-one there was only one bedroom; fifty-five with only two bedrooms, some o

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which were only partitioned; and four with three bedrooms. That being the class of houses provided for the working classes, it followed as a matter of course that a large family had to seek accommodation elsewhere. Mr. Joseph Berry, architect, of Huddersfield, said that he prepared plans for six houses on a piece of land belonging to the Council situated at Denby-road, Grange Moor. The houses would contain: On the ground floor, living room, 15 ft. by 12 ft. by 9 ft.; parlour, 11 ft. 9½ in. by 12 ft. by 9 ft. On chamber floor, three bedrooms—one 15 ft. by 12 ft., one 8 ft. 7½ in. by 12 ft., and one 8 ft. 3 in. by 8 ft., all 9 ft. high. In the basement, a keeping cellar, 10 ft. 6 in. by 7 ft.; and coal place, 4 ft. by 7 ft. The houses would be built of stone, lined with brick, and covered with blue slates. The usual outbuildings would be provided at the back, including one privy for each house. The estimated cost was 1,240*l.*, made up as follows: Buildings, 1,050*l.*; walls, outbuildings, and drainage, 100*l.*; and architect's commission, legal expenses, and incidentals, 90*l.* In his opinion the houses, when completed, should yield a rental of 4s. a week. Mr. C. B. Young, the Chairman of the Council, in reply to the Inspector as to why the Council only intended building six cottages, said the venture was only in the nature of an experiment. Witness also read letters making applications for tenancy of the houses when ready. In his opinion they would yield a rent of 3s. 6d. each net. Other evidence having been given for and against the scheme, the inquiry closed.

THE INCORPORATED ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.—The thirty-seventh voluntary pass examination of candidates for surveyorships under Corporations and District Councils carried out under the auspices of this Association, was held at the Medical Examination Hall, Victoria Embankment, on Friday and Saturday, April 18 and 19. Twenty-eight candidates presented themselves for examination. The examiners were:—1. Engineering.—Mr. A. E. Collins, M.Inst.C.E., assisted by Mr. J. P. Barber, M.Inst.C.E. 2. Building Construction.—Mr. A. M. Fowler, M.Inst.C.E., assisted by Mr. T. H. Yabbicom, M.Inst.C.E. 3. Sanitary Science.—Mr. James Lemon, M.Inst.C.E., assisted by Mr. W. N. Blair, M.Inst.C.E. 4. Municipal Law.—Mr. Jos. Lobley, M.Inst.C.E., assisted by Mr. J. T. Eayrs, M.Inst.C.E. Mr. Lobley was the superintending examiner.

REFUSE DESTRUCTOR, &C., NOTTINGHAM.—At the Guildhall, Nottingham, on the 18th inst., an inquiry on behalf of the Local Government Board was held by Mr. J. C. Pottinger, M.Inst.C.E., into the application by the Nottingham City Council to borrow two sums of money—10,000*l.* for the erection of a refuse destructor, stables, and cart-shed at the Radford depot, which adjoins the Nottingham Canal, and 5,400*l.* for the purposes of the improvement of Lower Parliament-street. Mr. Arthur Brown (city engineer), Mr. T. Wallace Gordon (assistant city engineer), Mr. C. G. Keep (Messrs. Manlove, Alliott, & Co., Ltd.), were present among others.

GREAT FIRE IN THE BARBICAN, CITY.—A disastrous fire, which resulted in enormous loss of property, occurred in the Barbican on Monday night. The fire broke out in the premises of Mr. F. J. Elliot, fancy hat manufacturer, Nos. 10, 11, 12, 13, and 14, Barbican. According to the official report issued by Commander Wells this building, of five floors, about 90 ft. by 30 ft., used as work-rooms, show-rooms, offices, and stores, with its contents, was burnt out, and had fallen down. Many other buildings were also practically burnt out or damaged. Owing to the heavy premiums demanded by the insurance companies for houses in this part of the City, where so many great fires have occurred in recent years, many of the buildings destroyed, and their contents, were uninsured.

CAPITAL AND LABOUR.

THE PENRHYN QUARRY.—We are informed that during the past two months seventy men have been taken on, as against forty-eight in the two previous months, and the work of development is progressing very rapidly, whilst there is a steady increase in the output of slates and slabs. The workmen (now numbering 843) are working so energetically that the quarrymen's average wage for the last two months reached the highest on record—viz., 6s. 0d. per day for month ended March 18, and 6s. 11½d. per day for month ended April 15. The number of "contracts" let in the quarry is also increasing, and thus bad rock and rubbish is rapidly and economically being cleared on piecework wages, enabling industrious labourers, of good physique, to earn high wages—in fact, in some cases, as much as 5s. and upwards per day.

ABERDEEN MASONS.—A meeting of the Aberdeen Building Branch of the United Operative Masons and Granite Cutters' Union was held on the 15th inst. in the Trades Hall, Belmont-street—Mr. G. Ogg, President, in the chair—to consider the question of ceasing work at noon on Saturdays, and thereby reducing the working hours on that day to five. By a majority the meeting decided to adhere to the existing arrangement. At present, during the winter months, the Building Branch work only five hours on Saturdays. The resolution which was defeated applied, therefore, to the Saturdays from May to October, inclusive.

LEGAL.

ACTION AGAINST AN ARCHITECT.

THE case of "The Egham Rural District Council *v.* Gordon" came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Darling and Channell, on the 10th inst., on the appeal of the plaintiffs from a judgment given for the defendant by the Chertsey County Court Judge. The action was brought by the plaintiffs to recover 107*l.* for extraordinary expenses incurred in repairing damage to a road caused by extraordinary traffic. It appeared that the defendant ordered 250,000 bricks for a house he was building, and during his absence abroad they were sent by steam haulage, the traction engines weighing 14 tons, and these caused the damage. The case turned on the construction to be put on the Highways and Locomotives (Amendment) Act, 1878, as amended by the Locomotives Act, 1898, which enacted that the expense caused by traffic of excessive weight could be recovered from the person by whose order the traffic was conducted. The County Court Judge, while finding that the weight of the traffic was excessive, held that it did not take place in consequence of the defendant's orders, and gave judgment for the defendant. Hence the present appeal.

At the conclusion of the arguments the appeal was dismissed with costs.

Mr. Macmorran, K.C., Mr. Pritchard, and Mr. M'Calmont Hill appeared for the appellants, and Mr. Danckwerts, K.C., and Mr. R. Cunningham Glen for the respondent.

IMPORTANT ACTION BY BUILDERS AGAINST THE ARMY AND NAVY CO-OPERATIVE SOCIETY.

MR. JUSTICE WRIGHT in the King's Bench Division, on the 10th inst., delivered a considered judgment in the case of "Martin Wells & Co. *v.* The Army and Navy Co-operative Society, Ltd.," which was heard by his lordship recently.

Mr. English Harrison, K.C., and Mr. Hudson appeared for the plaintiffs; and Mr. Reginald Bray, K.C., Mr. McIntyre, and Mr. Turner for the defendants.

Mr. Bray said that as the onus was on the defendants, he had to open the case. The plaintiffs, who were builders, claimed in the action the balance of a final instalment, viz., 2,900*l.* The defendants claimed to set off against that an equal amount for penalties or liquidated damages. The contract between the parties was dated October 29, 1897. It provided for the pulling down of certain premises which had been acquired by the defendants, and for the re-erection of buildings upon the site. The contract price was 47,170*l.*, and the omissions as eventually settled were 4,301*l.*, and the extras 2,298*l.* So there would be a net deduction of just over 2,000*l.* The contract provided that the contractors should execute the works according to the plans and specifications, the specification being deemed to form part of the contract. The contract provided that the new buildings should be completed within twelve months, and if there was delay plaintiffs should be liable to a penalty of 10*l.* a day. The contractors had to provide everything of every sort. As the contract was dated October 29, 1897, the works in the ordinary course ought to have been completed by October 29, 1898. Three months' extension, however, was allowed under Clause 16, which would bring it to January 29, 1899. The works were not, in fact, completed until January 2, 1900, nearly a year afterwards; but the defendants had only claimed penalties for 290 days, which would be up to about the middle of November. The contract contained an arbitration clause which provided that there should be the right of appealing from the arbitrator's decision to a referee. The defendants' contention was that the board of directors, under Clause 16, finally decided that three months was the extension to which the plaintiffs were entitled to complete the work, and that plaintiffs could not go behind it. The learned counsel then read to his lordship a great number of letters which had passed between the plaintiffs and the defendant society's directors, the plaintiffs and the defendants' architect, Mr. Bull, and the solicitors for the parties. On March 17, 1898, the plaintiffs wrote to the directors asking for an extension of time in which to complete the contract, as they had been delayed in getting on with the work in consequence of sub-contractors failing to deliver certain ironwork ordered from them. There was no obligation on the plaintiffs to employ these particular sub-contractors. On March 25, 1898, the defendant society's directors decided that there was no reason to give the plaintiffs further time in which to complete the contract. The next letter of importance was dated July 15, 1898, from the plaintiffs to the secretary of the defendants, stating that they had been greatly delayed in the work in consequence of Messrs. Dorman, Long, & Co. failing to deliver the girders and joists ordered from them. The defendants solicitor replied to that letter, asking for a copy of the contract between the plaintiffs and Messrs. Dorman, Long, & Co., and an explanation why the plaintiffs should still continue to employ that firm. The plaintiffs answered that letter on July 19, stating that Messrs. Dorman, Long, & Co. were the largest English makers and manufacturers of these sections, and that they had done all they could to expedite the work in all its branches. On July 28 the defendants' solicitor wrote to the plaintiffs asking what extension of time they wished allowed to them for delay in non-delivery of ironwork, and full particulars of how the claim was made out. On August 5 the plaintiffs replied that they were unable to give the time they wished allowed them until they received the ironwork. Other letters passed between the parties, but nothing further was done till April 30, 1899, when the plaintiffs wrote to Mr. Bull, the defendants' architect, that the job was at a complete standstill owing to the non-delivery of the steel joists, and asking Mr. Bull to lay these facts before the directors. It was then arranged that the directors should meet Mr. Martin Wells and his manager, and accordingly those gentlemen, on May 25, went before the board, and the board, having heard their explanation, adjudicated on the matter, and decided to allow a three months' extension. On June 9 the plaintiffs, having received notice of the adjudication, wrote that they had been advised that it was not competent for the directors to exercise as they had purported to do their powers under the clause of the contract at that stage, and that they were prepared to show to any impartial tribunal good reasons for the delay which had occurred, and that the causes of the delay were such as to exempt them from injury or damages. On June 15 the secretary of the Society wrote to the plaintiffs asking them to forward to the directors particulars of the causes of delay, and then they would consider them. The plaintiffs, however, replied, adhering to what they had said in their previous letter. They then came to the period when the contract had been completed, when the directors proposed again to go into the question of another extension of time, and at their instance a letter was written by Mr. Bull on February 8 to the plaintiffs asking as to the cause of delay in the completion of the buildings from and after May 25, 1899, to January 2, 1900. On February 13 the plaintiffs replied that it was solely due to the non-completion of work by special contractors, over which they had no control. They added: "No delay was caused over work of which we had control." On February 20 the secretary wrote to the plaintiffs asking them again to appear before the Board, but this the plaintiffs declined to do, saying they saw no useful purpose to be gained by doing so, as they denied the right of the directors to adjudicate on the question of the penalties, being interested parties. The plaintiffs also denied that any penalties were due from them at all. Mr. Bray said that if the plaintiffs had come before the directors, possibly some arrangement could have been made. The directors did not wish to take any advantage of the plaintiffs, and they were prepared to allow any further time that the plaintiffs might substantiate before them. But short of that, he submitted that the defendants' legal rights had been left open by Clause 16. What the plaintiffs said in their pleadings was that if the board of directors had adjudicated they had no power to so adjudicate on their own wrongful acts. He (counsel) did not admit any wrongful acts.

His Lordship: We must see what the wrongful acts are.

Mr. Bray said that the wrongful acts alleged were that the defendants in breach of their contract prevented the plaintiffs from completing the works within the time specified by the contract by failing to give the plaintiffs possession of certain parts of the site. There was no ground whatever for that charge. That was a mere afterthought. The next thing he had to deal with was as to suspension of work on the part of the builder.

His Lordship said it did not appear to him that it was for the learned counsel to labour these points. It was for Mr. English Harrison to prove his case.

Mr. Bray said the only other question was as to the date of completion.

His Lordship: I suppose the architect is the proper person to say when the building is completed, is he not? I have now got a general idea of your case, and I should like to know how Mr. English Harrison puts it.

Mr. English Harrison said that in substance there were two matters he had to deal with. The defence to this claim to penalties was twofold. One was that by the conduct pursued by the parties during the execution of these works they had in effect waived any question of penalties altogether, and next that by the way in which those parties conducted themselves during the execution of the works defendants failed to adjudicate at the right time or in the right way in the meaning of Clause 16. That the defendants, by having given the plaintiffs orders after the time had elapsed for the completion of the contract—after October 29, 1898; and also having given the plaintiffs orders after the extended time, viz., January 29, 1899; and also having broken the contract themselves in various particulars; they had by their acts and conduct prevented the plaintiff

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completing the contract within the specified time or the extended time up to January, 1899, and consequently that the claim for penalties ceased. The learned counsel submitted that the defendants had not given the plaintiffs the possession of the site as they should have done, and that the architect had completely altered the order in which the plaintiffs had intended to do the work. This was one of the chief causes of delay. When the plaintiffs remonstrated, the architect told them that he had the control of the works, and that the plaintiffs must do as he told them. Great delay had been caused by acts of default by the sub-contractors. He contended that the defendants' claim for penalties had gone by reason of the defendants not giving them possession of the site in the manner and at the times provided for. He submitted that both parties had mutually departed from the contract, and that the penalties had gone independently of Clause 16 altogether. The learned counsel also further contended that the directors had no power to adjudicate under Clause 16 upon defaults of their own.

His Lordship said he was most struck with the learned counsel's argument on that point. He did not think that he would make much of the point of the general waiver of the claim to penalties.

Mr. English Harrison pointed out that several of the sub-contractors who had failed in delivering their goods were firms which the plaintiffs were compelled to employ.

His Lordship: Supposing I should be right in holding that the directors under clause 16 had no jurisdiction to deal with their own defaults, then what follows?

Mr. Bray: Then it will rest in this way: that plaintiffs will have to prove that in fact there was default on our part which prevented them going on with the building. I say there was no default on our part; and, consequently, that we did not prevent them building.

Evidence was then given on both sides touching on the matters in dispute, at the conclusion of which his Lordship said he would consider his judgment.

Accordingly on the 10th inst. his Lordship delivered judgment, holding that the plaintiffs had made out their case, and that the defendants were not in the circumstances entitled to claim penalties. Judgment was accordingly entered for the plaintiffs for the amount claimed, with costs, and interest at the rate of 4 per cent.

BUILDERS' ACTION AGAINST DECORATORS.

THE hearing was concluded on the 17th inst. of the case of Davidson *v.* Hooydonk & Co., Limited, before Mr. Justice Wright, sitting without a jury in the King's Bench Division.

In this case the plaintiff, a builder, of Dimsdale-road, Newcastle, claimed to recover from the defendants, a firm of decorators, of London, 200*l.* for certain scaffolding. It appeared that in December, 1898, a company called London and Lancashire, Limited, of Bradford, proposed to build a theatre in Blackburn, and for that purpose employed the plaintiff to do the general building. The plaintiff's case was that an arrangement was made by which he was to leave his scaffolding for the use of other trades, and that for this he was to receive the sum of 200*l.* The London and Lancashire Company contracted with the defendants to do the decorating of the theatre, and at the conclusion of their work they were entitled to sell the scaffolding. The plaintiff alleged that the defendants did sell the scaffolding for 43*l.*, but refused to pay plaintiff the 200*l.* under the agreement. The defendants denied that any such agreement as alleged existed, but alternatively paid 43*l.* into court in satisfaction of the plaintiff's claim.

In the result his lordship, after hearing evidence, came to the conclusion that the plaintiff was not entitled to more than the 43*l.* paid into court, and gave judgment for the defendants with costs.

Mr. Witt, K.C., and Mr. Pollock appeared for the plaintiff, and Mr. Arthur Powell for the defendants.

IMPORTANT POINT UNDER THE WORKMEN'S COMPENSATION ACT, 1897.

THE case of Elliott *v.* Liggins came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Darling and Channell, last week, for judgment on the appeal of the defendant from the decision of the Judge of the Coventry County Court.

It appeared that the plaintiff Elliott was employed by the defendant from November 5, 1900, at a salary of 35s. a week. Elliott worked under that agreement until July 11, 1901, when he was disabled by an accident. On August 13 he served defendant with notice of the accident and of a claim for compensation under the Workmen's Compensation Act, 1897. The defendant agreed that Elliott should be awarded the full amount allowed by the Act, namely, half his weekly wages during incapacity, or 17s. 6d. a week. The defendant on November 2, 1901, gave Elliott a week's notice to leave. Elliott then sued the defendant in the Coventry County Court for 15*l.* 3s. 4d. for wages he alleged to be due to him between July 11 and November 9, namely, for the other half of his weekly wage of 35s. The County Court Judge, notwithstanding that Elliott had not, in fact, worked between July 11 and November 9, gave judgment for him for this amount. A claim by Elliott for wages between November 9 and December 25 was disallowed by the County Court Judge. Elliott also claimed a quarter's wages in lieu of notice, and under this head the County Court Judge awarded him a month's wages. The defendant appealed from the decision of the County Court Judge on the point only that Elliott was not entitled to the 15*l.* 3s. 4d., the balance of his wages between July 11 and November 9, on the ground that, as he had chosen his own method of compensation, he could not, having had the benefit of it, make the defendant liable for the other half of his wages. For Elliott it was contended that the contract of service lasted till November 9, and that if the Workmen's Compensation Act had never been passed, he would, notwithstanding that he was prevented by illness from working, have been entitled to his full wages, and there was nothing in the Act which took away his rights under the contract.

The Lord Chief Justice in giving judgment said the court had to look to the broad intent of the Act in applying its provisions. Several sections of the Act provided that the parties might agree the compensation, and therefore proceedings did not cease to be proceedings under the Act because they had resulted in a bargain contemplated by the Act. The first schedule to the Act provided that when incapacity for work resulted, the compensation should be a weekly payment not exceeding half the weekly earnings. These provisions and the giving of notice, and the receipt of compensation under those provisions were inconsistent with the view that the original wages were to go on during the time of incapacity. The workman who was taking the benefit of the Act on the ground of incapacity, and had had that amount assessed, could not accept his compensation and then claim also to have his wages during all that time. He thought the judgment in favour of Elliott for 15*l.* 3s. 4d. ought not to stand and that the appeal ought to be allowed.

Mr. Justice Darling agreed. If the argument on behalf of Elliott was right he would logically be entitled to his full wages, and compensation in addition, because he could not earn them. It was impossible to suppose that the legislature ever intended any such consequence. This decision was not opposed to the interest of workmen as a class, because if the decision had been otherwise employers would always discharge a workman at once after an accident.

Mr. Justice Channell also concurred.

The appeal was accordingly allowed, with costs.

CITY ANCIENT LIGHT DISPUTE.

THE case of Wriford *v.* Patrick came before Mr. Justice Byrne in the Chancery Division on the 22nd inst. An action by the plaintiff for an injunction to restrain the defendant from erecting any buildings on the site of his old premises Nos. 39 and 41, Wood-street, E.C., in such manner as to darken, injure, or obstruct the ancient lights of the plaintiff's premises Nos. 3 and 4, Little Love-lane. There was also an alternative claim for damages.

It appeared that the plaintiff is the lessee of Nos. 3 and 4, Little Love-lane, the premises being situated on the northern side of the lane, the back part being lighted as follows:— The ground floor by a sloping or leanto sky-light, and the first and second floors by three windows facing north and one window facing west, all these windows being ancient lights. The plaintiff's case was that in December, 1900, or at the beginning of 1901, the defendant proceeded to demolish the old buildings erected on the site of Nos. 39 and 41, Wood-street, and erected thereon new premises, which substantially interfered with the lights in question. The position of the defendant's building which it was alleged would interfere with the plaintiff's lights, were (1) the gangway connecting the front and back parts of Nos. 39 and 41, Wood-street, in so far as it had been raised above the level of the old gangway as it previously existed; (2) a chimney-stack erected on the defendant's premises, in so far as it rose above the level of the old parapet level at the end of the front portion of Nos. 39 and 41, Wood-street; and (3) the buttress supporting such chimney-stack, and the portion of the wall on line and above running north of the chimney-stack, and the roof and sloping part of such wall.

The main defence was that the defendant's building caused no substantial or material interference with the plaintiff's lights.

Mr. Levett, K.C., and Mr. F. H. Manghan, appeared for the plaintiff; and Mr. Rowden, K.C., and Mr. H. Wace for the defendant.

Mr. M. B. Adams, F.R.I.B.A., called and examined on behalf of the plaintiff, said he had been in practice as an architect and surveyor for twenty-five years, and was acquainted with the premises of the plaintiff and defendant. He had seen the plaintiff's building before the demolition of the defendant's premises and since his new premises had been erected. In his opinion the defendant's new building materially interfered with the light previously enjoyed by the plaintiff's windows.

Cross-examined;

The defendant's new gangway interfered with the diffused light to the windows on the ground, first and second floors of the plaintiff's premises. The chimney stacks and the sloping roof and wall affected the plaintiff's windows on the first and second floors. He did not think that the chimney stack did materially interfere with the light to the windows on the first and second floors, but it did affect it.

In reply to his Lordship, the witness stated that the defendant's new gangway was 7 ft. 5½ in. higher than the old gangway.

Mr. J. Douglass Mathews also gave evidence in support of the plaintiff's case. He said that in his opinion the letting and selling value of the plaintiff's premises had been affected some 20 per cent. by the defendant's new building.

At this part of the case his lordship suggested that the parties might come to terms, as there was obviously some obstruction of the plaintiff's lights.

After the mid-day adjournment, Mr. Rowden intimated that he was prepared to settle the case on the following terms, viz., to remove the movable portion, as far as the new portions went, of the gangway; to lower the wall of the parapet to the eaves of the roof, and to pay the plaintiff's taxed costs of the action.

His Lordship said he thought the proposal sounded reasonable. It would have been difficult to have persuaded him that the gangway did not interfere with the plaintiff's lights.

Mr. Maugham, on behalf of the plaintiff, said he was prepared to accept the terms stated.

EMPLOYERS' LIABILITY ACT:

QUESTION AS TO "LINING" SCAFFOLD BOARDS.—WHAT IS "THE RULE OF THE SHOP?"

AT the Marylebone County Court on Tuesday, before Judge Stonor, William Howcroft, a builder's labourer, Ladbroke-grove, Notting Hill, W., brought an action, under the Employers' Liability Act, against Messrs. Burdett & Son, builders and contractors, Spring-street, Hyde Park, W., claiming damages in respect of personal injuries said to have been sustained owing to negligence on the part of the defendants or their servants.

A similar action against the same defendants was brought by Arthur Rudge, a painter, Wharton-road, West Kensington Park, W.

Mr. B. B. Morle, counsel, appeared for the plaintiff Howcroft; Mr. W. Sanderson, counsel, for the plaintiff Rudge; and Mr. J. Shakespear, counsel, defended.

William Howcroft stated he and Rudge were in the defendants' employment on August 7 last, assisting in some building operations at Gloucester-gardens, W. The defendants' foreman on the job told them to work upon a wall upstairs, adding, "You will find scaffolding there." In accordance with these directions they formed a small scaffold by placing two boards upon a couple of pairs of steps. The "span-board" was 12 ft. long, but the only board they could find to place upon it as a "lining-board" was only 8 ft. long. After they had worked upon this scaffold for a short time the span-board broke, and they fell a considerable distance, each sustaining bad injuries. Subsequently it was found that there was a large knot near where the board gave way.

Cross-examined: When erecting the scaffold he saw nothing in the board to indicate that it was likely to break.

Counsel for the defendant: Why did you put the 8 ft. board to "line" a 12 ft. board? Plaintiff: Because that was the only one there.

If there had been a longer one you would have used it? Yes.

Did you complain to the foreman that the plank was not long enough? I am not a judge as to planks. No, I didn't complain.

Re-examined.—He understood that it was customary in the trade for builders to employ a man to periodically examine the boards and plant generally to see that all was in a proper condition, but the defendants, as far as he was aware, did not employ a man for this purpose.

Arthur Rudge, the other plaintiff, gave similar evidence.

John Bryant, a scaffolder, who had worked on the job, said that the board in question would not have broken but for the large knot. He was now employed by another firm, and his work included the examining of scaffold-boards and the plant generally to see whether all was safe for use or not.

Medical evidence having been given, the case for the defence was opened.

Arthur Needs, the foreman on the job, referred to above, admitted telling the men to erect their own scaffold, and maintained that it was customary in such cases for the men to exercise their own discretion as to whether the scaffold was safe or not. He could not swear that there were over 12 ft. boards on the job, but if the men had not all they wanted for the work it was their duty to inform him of the fact.

The Judge: An important question is whether there was anything wrong in the men using the 8 ft. lining-board with the 12 ft. span-board.

Witness: I should not have done so.

In answer to further questions, the witness added

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that he did not examine the boards when they firs came on the job.

Cross-examined: The defendants did keep a man to look after the scaffold plant and see that it was in a proper condition, but he (witness) could not say when the board in question was last examined.

George Wilson, the defendants' general foreman, considered that the 12-ft. span-board should be lined by another of the same length, or thereabout. This was "the rule of the shop."

Henry Loby and Richard Andrews, painters, agreed that a lining board should be about the same length as the span-board.

Counsel for the defence submitted that the plank which broke was not defective, for, he pointed out, it did not break exactly where the knot was. It was, of course, impossible to get a scaffold board without a knot, and as it was customary for the men to erect such small scaffolds themselves the responsibility was upon them to see that they did not use anything that might be unsafe. He further submitted that in the present case there was evidence of contributory negligence on the part of the plaintiffs.

The Judge: I come to the conclusion that the *causa causans* of the accident was in the men using a 12-ft. span-board with an 8-ft. lining-board, and on the ground of contributory negligence I find for the defendant.

Counsel then agreed to Howcroft receiving, under the provisions of the Workmen's Compensation Act, 1*l.* per week from the date of the accident to a date thirteen weeks subsequent to the present trial. It was also agreed that the plaintiff Rudge should receive compensation equal to 1*l.* a week from the date of the accident to February 4 last, when he resumed work.

His Honour allowed no costs.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

23,245.—A METHOD OF VENTILATION: *Titel & Wolde.*—For purifying air within an apartment, but without admitting a draught from outside, the inventors devise diaphragms of caoutchouc, or of some fabric steeped in a solution of that substance, which they stretch over a frame, or other mounting, before an opening in the wall, so that the fabric shall by dialysis, or some such action, transmit carbonic acid, ammonia, volatile organic scents, and exhalations from the human body.

23,250.—A SIZE OR SUBSTITUTE FOR GLUE: *J. Wezel.*—Instead of animal glue for use in preparing chromo-paper, a compound is made of equal parts of 7·5 deg. B. solutions of horn in soda or potash lye, with potato meal and soluble glass, acetic acid being added as a neutralising agent.

23,250.—A GRAVET SLIDE-RULE: *A. Forster.*—A slide-rule for use in computing steam pressures, expansion ratios, &c., has the divisions of the left-hand upper scale marked as decimals to be read as "cut-offs" and "efficiencies," whilst the right-hand upper scale is divided to be read for the number of expansions to suit any expansion curve required. For the latter scale the inventor sets the terminal line on the slide to read the calculated mean pressures for a given initial pressure and given numbers of expansions, the numbers of expansion being marked upon it against the central line of the bed.

23,311.—A LIFT: *J. W. Reno.*—Two endless belts fitted with treads are passed around sprocket wheels, driven with bevel gearing from a shaft joined to the motor, a hand-rail is formed with a split flexible tube mounted upon an endless chain passed around horizontal sprockets at the top and bottom of the incline—the top sprocket being upon a shaft which is joined with a universal joint to a shaft that is driven with bevel gearing.

23,322.—MECHANISM FOR CAGE-LIFTS: *Elektrizitäts A. G. vorm. Schuckert & Co.*—For gradually reducing the speed of the cage by means of automatically introducing a resistance in the armature circuit of a shunt-wound motor. As the cage approaches a landing an arm projecting from it makes contact with a bar and so closes the circuit of a relay coil in parallel with the armature of the driving-motor, an arm which is worked by an auxiliary motor regulates the resistance in the armature circuit, with the action of the relay coil the circuit of the auxiliary motor is closed, and the motor is thereupon started to turn the arm so as to insert the resistance in the armature circuit of the motor and retard its speed. When it has been stopped (by opening the main circuit), the core of the relay coil falls to complete a circuit to reverse the auxiliary motor and so to short-circuit the controlling resistance. In another form a centrifugal governor that is driven with a magnetical coupling for opening and closing the contracts takes the place of the relay coil.

23,388.—MATERIALS FOR COVERING FLOORS, WALLS, &C.: *M. Dickmann.*—The materials, which are described as being fireproof, water-proof, air-proof, sound-deadening, &c., are made of paper, peat, fibre, pulp, asbestos, &c., rolled, moulded, or pressed into sheets and then treated with oxidised linseed oil, alum, sulphate of iron, soap, water-glass, resins, wax, glue, or size, and other suitable substances. The back of each sheet is recessed and grooved, and spaces fashioned in the material are to be filled with sawdust, peat, linoleum, cork, leather, gutta-percha, or some similar materials, or with compressed air by sizing or glueing the sheet in a receiver filled with compressed air.

23,399.—DECORATIVE WORK: *P. Bacon & Brothers and A. A. Bacon.*—Strips of plain or coloured wood, metal, glass, enamels, marble, or earthenware are held between leaden cames or grooved strips, as in decorative leaden glazing, and so produce ornamental sheets that will serve for covering walls, ceilings, and other surfaces.

23,403.—A BRAZING FLUX: *F. Pich.*—An admixture of boric acid and a sodium salt, say, sodium carbonate, will form during the process of brazing a sodium borate in an anhydrous state, and thereby obviate intumescence; the flux can be made more fluid by adding sodium chloride to the compound.

23,442.—FITTINGS FOR STEEL-YARDS: *C. W. Brecknell.*—In order to afford a greater range in the load that may be accurately weighed, the inventor forms the knife-edge bearings of the load-shackle upon half-rounded brackets that are affixed to the steel-yard, the use of a small balance weight is provided for by bringing the load-sustaining bearings and the hanging-hook bearings closely together, whilst their relative positions may also be reversed; there are stops which prevent the steel-yard from vibrating unduly, and for weighing fractions of a pound an auxiliary sliding weight is employed.

23,440.—A HOLDFAST OR FASTENING FOR RAIN-WATER AND OTHER PIPES: *R. Holden.*—For attaching iron pipes to walls is devised a box-shaped bracket which is cast on to the pipe-socket and is hung upon a headed spike which the engagement with the one or the other of two slots will secure to the wall.

23,461-2.—CONDUITS FOR ELECTRICAL PURPOSES: *G. A. Wayss and C. Freytag* (*Wayss & Freytag*).—Insulating-linings are fitted in multiple tubular conduit-sections fashioned of beton, concrete, and so on, by putting a block within a vessel on the top of which is a hopper; through openings in the bottom of the vessel are passed a number of steam or hot-water pipes (which are closed with conical spring sleeves), and so into the tubular passages. The pipes serve to maintain the insulating material in a molten state. When cooled, the pipes, having been withdrawn, leave the desired lining inside the sections. (23,462) For moulding the conduits the inventors affix tubular steel or other cores to a frame that slides upon rails, and force them into corresponding holes in the mould-box; they ram concrete, cement, artificial stone, or some other filling into the mould round about the cores, and then abstract the cores backwards with a windlass that is worked with toothed wheels and a handle.

23,486.—SIPHONICAL DISCHARGE AND FLUSHING APPARATUS: *P. Schurig.*—An annular float is fixed within a bell which is mounted upon a well that contains the standpipe. The pulling down of the bell impels water over the crown of the siphon for starting the flush. A flexible pipe joins the crown of the bell to a pipe attached to a float within a compartment that will be slowly filled by means of apertures from the main cistern. The float will fall very slowly after the main siphon has been started, so that the uncovering of the pipe admits air for breaking the flush after a certain difference between the water levels in the well and in the cistern has ensued. Thus the height of the original water level in the cistern will not affect the amount of the flush.

23,530.—IMPROVEMENTS IN SCREWDRIVERS: *F. Dale.*—The nick of a screw takes the blade of the tool, which is retained in that position with a coned sleeve that slides in opposition to the action of a spring inside a tube secured to the blade. On the blade is a collar upon which the spring presses. Pegs that engage with the tube and the sleeve respectively will keep the sleeve clear from the end of the blade.

23,574.—FURNACES FOR BURNING CEMENT, LIME, &C.: *E. H. Stein.*—A roasting and calcining furnace is built up in three sections, a slotted base-plate sustains the metallic casing; the material is first moulded into bricks, it is next heated in the upper section, and after having been burned in the middle section, is cooled below before its discharge; air flows through the base-plate and so around the lower section, becoming heated before it enters the middle fire-chamber, and air flowing through openings in the middle of the casing is also warmed by the middle chamber, and so helps to warm the drying chamber above. The two lower chambers are built up with rings, each ring being composed of segments out of contact with one another in order that expansion may ensue freely, whilst every segment is separately fastened to the casing; lateral pressure is diminished by covering the joints between the segments with strips that are held up with studs which bear upon the casing.

23,575.—FITTINGS FOR BATHS AND LAVATORIES: *H. M. Weaver.*—On to the nozzle that carries the seating of the waste-valve is screwed a bulb-shaped trap, from the side of which projects a hollowed arm, the trap and arm being made in one piece. Within the arm is a valve-rod fitted with a ball that rocks in its bearing. The inner end of the rod that extends over the trap is joined with a linked rod to the valve at the bottom of the basin. Its outer end has an adjustable connexion with a rod that extends downwards from the push, whereby one can open the valve by pressing down the push.

23,602.—A SUPPORT FOR PLASTER, &C.: *Z. Segalerba.*—A support for plasterers' work consists of a trelliswork or network made out of metallic strips, wire, and so on, which is to be nailed on to the joists. Paper sheets are laid over the network, which is plastered from below with some quickly-drying plaster. The wall or ceiling is then finished with liquid lime.

23,627.—A SLIDE-RULE FOR MEASURING TIMBER: *R. L. Jennings.*—A circular slide-rule is graduated with logarithmical scales. Two circular slides are fitted in the bed and are held with buttons. The outermost scale, which ranges from 3½ in. to 30 in., is graduated to advance by ½ in. in a direction opposed to that of the hands of a clock. Each of the inner three scales constitutes a repetition of a single-radius scale in the direction of the hands of a clock, and the principal cubical and superficial equivalents per ton are indicated upon them with asterisks. A double-radius scale is marked upon the underside of the outermost slide.

23,682.—PRISM PLATES FOR GLAZING: *J. G. Brown.*—Parallel ribs are fashioned upon prism plates of glass so that their plane surfaces shall subtend the faces of the plates at angles of 80 deg. and 60 deg. respectively; rounded ribs are formed between those ribs. The latter ribs will reflect and transmit diffused rays of light, whilst the rays that emerge through the other ribs will be at 90 deg. in respect of the prism plate.

23,718.—CONSTRUCTION OF KILNS: *W. W. Hewitt.*—The inventor arranges that the gases of ordinary cement kilns shall be conveyed through and underneath drying-chambers for the slurry which do their work in pairs, one being discharged and again charged whilst the other is in action; the covers of the drying-chambers, which will serve also as drying-floors, can be removed at will.

23,851.—MANUFACTURE OF CEMENT: *C. Dicsler.*—The roasting-drum or retort, into which is fed a finely-divided admixture containing silicic acid, together with the calcined calcareous materials, is heated with furnaces on its outside; spirally-bladed mixers, that turn in opposed directions, are mounted inside the drum, and force the materials towards the discharge-outlet. A perforated tube having a hollow trunnion at its end constitutes the inner mixer and conveys superheated steam at from 600 deg. to 700 deg. C., or hot air at about 900 deg. C.; the exhaust should take place through the charge-inlet.

23,880.—APPLIANCES FOR CAGES AND LIFTS: *J. Gary.*—A fixed screw is set up the middle of the well; the cage is fitted with a corresponding screwed sleeve which is secured to a drum in a motor chamber under the cage, one flange engaging with pinions on the motor-shafts; for very deep shafts the fixed screw is fashioned with a threadless section. When the cage rises it carries with it the lower of two cross-beams which have loose screwed collars that engage with the middle screw and rods forced outwards with springs. As the upper end of the screwed sleeve reaches the upper beam the latter is forced upwards in front of the cage after the loose collar has become engaged with the sleeve; the lower beam ascends until it meets the threadless section and will then cease from travelling with the cage, being sustained by the rods. With the descent of the cage the action is reversed, and the upper beam replaces the lower beam.

MEETINGS.

FRIDAY, APRIL 25.

Architectural Association.—1. Mr. E. A. Gruning on "Arbitrations." 2. Nomination of Officers for Session 1902-1903. 7.30 p.m.

Royal Institution.—Mr. J. Mackenzie Davidson, M.B., on "X-Rays and Localisation." 9 p.m.

Glasgow Architectural Craftsmen's Society.—Business meeting.

SATURDAY, APRIL 26.

Architectural Association.—Spring Visit (1) to the new fire-station, Perry-vale, Forest Hill, S.E.; (2) to Horniman's Museum.

Northern Architectural Association.—Visit to the new buildings in Dean-street and Collingwood-street, Newcastle. 2.45 p.m.

Edinburgh Architectural Association.—Visit to Trinquair House, Innerleithen. Should permission be obtained Pirn House will also be visited. 8 p.m.

MONDAY, APRIL 28.

Society of Arts (Cantor Lectures).—Mr. R. T. Glazebrook, M.A., on "Glass for Optical Instruments." Ill. 8 p.m.

TUESDAY, APRIL 29.

Architectural Association Camera and Cycling Club.—Professor R. Elsey Smith on "Some Churches and Chateaux on the Valley of the Loire," illustrated by lantern slides. 7.30 p.m.

Institution of Civil Engineers.—Annual General Meeting of Corporate Members only, to receive the Report of the Council, and to elect the Council and Auditors for the ensuing year. 8 p.m.

WEDNESDAY, APRIL 30.

Society of Arts.—Mr. Edward T. Scammell on "The Timber Resources of the Australian Commonwealth." 8 p.m.

City of London College Science Society.—Mr. E. R. Calthrop on "Narrow-Gauge Light Railways of Heavy Traffic Capacity."

THURSDAY, MAY 1.

Royal Institution.—Mr. A. Smith Woodward, LL.D., F.R.S., on "Recent Geological Discoveries." 3 p.m.

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Society for the Encouragement of the Fine Arts.—Second Conversazione, at the Galleries of the Royal Institute of Painters, Piccadilly.

Institution of Electrical Engineers.—Mr. S. G. Brown on "Automatic Relay Translation for Long Submarine Cables." 8 p.m.

FRIDAY, MAY 2.

Institution of Junior Engineers.—Mr. Lewis H. Rugg, on "Some Factors in Colonial Railway Construction." 8 p.m.

Royal Institution.—Professor A. E. Tutton, F.R.S., on "Experimental Researches on the Constitution of Crystals." 9 p.m.

SATURDAY, MAY 3.

Edinburgh Architectural Association.—Visit to Torwood Castle and Broch of Tappock.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 9.—By MESSRS. KEMSLEY (at Romford).

Romford.—North-st., Brooklands and 4 a. 1 r. 26 p., f., p. £2,000
1 and 2, Brookland-villas, f., p. 910
Ilford.—88, Southborough-rd., f., w.r. 36*l.* 8s. 345

April 10.—By BAXTER, PAYNE, & LEPPER (at Bromley).

Bromley, Kent.—65, Widmore-rd., f., e.r. 60*l.* .. 720
High-st., six freehold building sites 8,300

By PROTHEROE & MORRIS (on the Estate).

Clacton-on-Sea, Essex.—Madeira-rd., &c., 26 plots of freehold building land (in lots) 658

April 11.—By PROTHEROE & MORRIS (on the Estate).

Ashford, Middlesex.—Townsend-rd., &c., 52 plots of freehold building land (in lots) 1,109

By DAVIDSON & GARDEN (at Aberdeen).

Turriff, &c., Aberdeenshire.—The Estate of Laithers, 1,203 acres 27,100

April 12.—By HENRY HENDRIKS (at Bridgnorth).

Highley, Salop.—A freehold house and an enclosure, 2 a. 1 r. 5 p., y.r. 20*l.* 485

April 14.—By F. E. FERDINANDO & Co.

Newington Causeway.—Union-sq., i.g. rents 11*l.*, u.t. 41½ yrs., g.r. nil 170
Clapham.—Ashmole Cottages, f.g.r. 10*l.*, reversion in 21 yrs. 550

By E. W. HARRIS.

Beckenham.—60 and 61, Parish-ln., f., e.r. 65*l.* .. 500
Anerley.—123, Oakfield-rd., f., e.r. 52*l.* 800

By HEAPS, SON, & REEVE.

Brixton.—Nursery-rd., f.g.r. 14*l.*, reversion in 65 yrs. 320
Shannon-grove, f.g.r. 15*l.* 10s., reversion in 65 yrs. 71

By JONES, LANG, & Co.

City of London.—17, Mincing-ln., area 2,900 ft., building lease for 80 yrs. let at per annum 550

By MULLETT, BOOKER, & Co.

Portman-square.—3, Gloucester-st., and 15, Portman-mews North, u.t. 21 yrs., g.r. 45*l.*, p. .. 2,350

By MIVART & Co.

Paddington.—25 and 26, Bark-pl., u.t. 11 yrs., g.r. 14*l.*, y.r. 96*l.* 550

By WOODS & SNELLING.

Edmonton.—2 to 25, St. Mary's-gdns., u.t. 69 yrs., g.r. 96*l.*, w.r. 429*l.* 1,000

By PROTHEROE & MORRIS (on the Estate).

Kingsdown Bay, Kent.—Main rd., &c., sixty-one plots of freehold building land (in lots) 671

April 15.—By L. CAVEY & Co.

Battersea.—2, Taybridge-rd., u.t. 68 yrs., g.r. 10*l.*, y.r. 45*l.* 500
Forest Hill.—13 and 15, Ewart-rd., f., w.r. 70*l.* 4s. 710

By E. H. HENRY.

Battersea.—222 to 228 (even), Lavender-hill, area 48,960 ft., f., y.r. 247*l.* 10s. 8,870
Clapham Common.—Lavender-gdns, a block of freehold building land, area 2 a. 1 r. 17 p. 1,730
20, South Side, f., y.r. 80*l.* 1,340
5, Orlando-rd., u.t. 63 yrs., g.r. 5*l.*, e.r. 50*l.* 535

By RUTLEY, SON, & VINE.

Acton.—135 and 137, Churchfield-rd., u.t. 75 yrs., g.r. 18*l.*, y.r. 90*l.* 1,010
St. Pancras.—67, Stibbington-st., u.t. 42 yrs., g.r. 9*l.*, y.r. 42*l.* 335
Clerkenwell.—122, 124, and 126, St. John-st. (S), u.t. 34 yrs., g.r. 31*l.* 10s., y.r. 142*l.* 1,300
Camden Town.—3 and 5, Crowndale-rd. (S.), u.t. 48 yrs., g.r. 18*l.*, y.r. 112*l.* 1,000
Croydon.—Canterbury-rd., f.g.r. 42*l.*, reversion in 62 yrs. } 1,870
Catford.—Hawstead-rd., &c., f.g. rents 39*l.*, reversion in 79 yrs. }

By WEATHERALL & GREEN.

South Kensington.—95, Onslow-sq., u.t. 32½ yrs., g.r., &c., 33*l.* 3s., p. 2,800
Balham.—56, 58, and 62, Sarsfeld-rd., u.t. 78 yrs., g.r. 22*l.* 10s., y.r. 104*l.* 910

April 16.—By ALLAN BOOTH.

Holloway.—253, Camden-rd., u.t. 43¾ yrs., g.r. 7*l.* 10s., p. 2,380

By FOSTER & CRANFIELD.

Dalston.—36, Shrubland-rd., u.t. 39½ yrs., g.r. 5*l.* 12s. 6d., y.r. 36*l.* 320

By HAROLD GRIFFIN.

Battersea.—20 to 26 (even), Sheepcote-lane, f., y.r. 72*l.* 16s. 755

By T. G. ROGERS.

Highgate.—29, Bismarck-rd., u.t. 81¾ yrs., g.r. 6*l.* 10s., y.r. 36*l.* 385

By T. WOODS (at Hounslow).

Hounslow, Middx.—82, 84, and 86, High-st., with shop yard, and slaughter-house, area 17,193 ft., f., e.r. 106*l.* 2,770
182, 184 and 186, High-st. (S), area 10,401 ft., f., p. 2,560
George IV.-rd., a freehold shop and cottage adjoining, e.r. 39*l.* 380
Wellington-rd. North, six building plots, f. 372

April 17.—By BISLEY & SONS.

Rotherhithe.—277, Lower-rd., u.t. 17 yrs., g.r. 3*l.*, y.r. 30*l.* £170
Deptford.—20, 22, and 24, Abinger-rd., w.r. 88*l.* 8s.; also l.g.r. 6*l.*, u.t. 37 yrs., g.r. 12*l.* .. 670
52, Abinger-rd., u.t. 39 yrs., g.r. 2*l.*, w.r. 26*l.* .. 230
25, Mornington-rd., u.t. 31 yrs., g.r. 2*l.*, y.r. 22*l.* 245
Bermondsey.—17, Lynton-rd., u.t. 32½ yrs., g.r. 5*l.*, w.r. 46*l.* 16s. 280

By H. J. BLISS & SONS.

Hackney-rd.—28 to 38 (even), Scawfell-st., f., w.r. 244*l.* 8s. 2,310
13, Dunloe-st., u.t. 25 yrs., g.r. 2*l.* 16s., w.r. 36*l.* 8s. 185
30, Elwin-st., u.t. 20 yrs., g.r. 4*l.* 10s., w.r. 56*l.* 8s. 165
Bethnal Green.—20, 22, and 24, Viaduct-st., u. 16 yrs., g.r. 7*l.* 10s., w.r. 81*l.* 18s. 270
39 to 49 (odd), Viaduct-st., u.t. 16 yrs., g.r. 15*l.*, w.r. 179*l.* 8s. 525
93, 97, 99, Seabright-st., u.t. 16 yrs., g.r. 7*l.* 10s., w.r. 72*l.* 16s. 225
Clapton.—4, Ferron-rd., f., y.r. 36*l.* 600

By G. W. DAWES & Co.

Kensington.—20, Colet-gdns., u.t. 89 yrs., g.r. 8*l.*, y.r. 45*l.* 600

By J. G. DEAN & Co.

Wandsworth.—15, 17 and 19, Blandfields-st., u.t. 94 yrs., g.r. 10*l.*, w.r. 109*l.* 4s. 825

By GLASIER & SONS.

Kentish Town.—231, Kentish Town-rd., c., y.r. 100*l.* 1,970

By HERRING, SON, & DAW.

Pimlico.—17 and 19, Aylesford-st., u.t. 34 yrs., g.r. 16*l.*, y.r. 92*l.* 5s. 700

By HOLCOMBE, BETTS, & WEST.

Aldersgate-street.—14 and 16, Fann-st. (S), u.t. 63 yrs., g.r. 15*l.*, w.r. 132*l.* 12s. 700
Portman-square.—44, Gloucester-pl, u.t. 13 yrs., g.r. 100*l.*, p. 400
Regent's Park.—14, Cornwall-ter. and 14, Cornwall-mews West, u.t. 18¼ yrs., g.r. 42*l.*, y.r. 200*l.* 1,400

By C. C. & T. MOORE.

Clapham.—61, 63, and 65, Binfield-rd., u.t. 40 yrs., g.r. 22*l.* 10s., y.r. 135*l.* 1,345
Hackney-rd.—68 and 70, Boston-st., f., w.r. 52*l.* .. 450
Haggerston.—3, 5, and 7, Nicoll-st., f., w.r. 54*l.* 12s. 430
Holloway.—36a, Eden-gr., f., q.r. 38*l.* 730
Old Ford.—1, Burgoyne-rd., u.t. 48 yrs., g.r. 4*l.*, w.r. 35*l.* 12s. 285
St. George's East.—11A, Christian-street (warehouse and stabling), area 2,000 ft., f., e.r. 80*l.* 1,320

STIMSON & SONS.

Bermondsey.—29 to 37 (odd), Yalding-rd., u.t. 32 yrs., g.r. 25*l.*, w.r. 150*l.* 2s. 950
195 to 201 (odd), Lynton-rd., u.t. 37 yrs., g.r. 20*l.*, w.r. 124*l.* 16s. 820
Clapham.—166, Clapham-rd., u.t. 42 yrs., g.r. 2*l.*, e.r. 80*l.* 650
Mitcham.—7, 8, and 9, Nicholl's Cottages, f., w.r. 33*l.* 3s. 245
1 to 4, 9, and 10, Homewood-ter., f., w.r. 117*l.* 13s. 1,275
Norwood.—11, Sunny Bank, f., e.r. 75*l.* 800
18 to 21, Sunny Bank, f., y.r. 134*l.* 1,820
Sunny Bank, i.g.r. 54*l.*, u.t. 58¾ yrs., g.r. 6*l.* 930
Old Kent-rd.—37, 39, 41, 43, 53, 55, and 57, Cooper's-rd., u.t. 31¼ yrs., g.r. 28*l.*, w.r. 212*l.* 1,145
81 and 83, Avondale-sq., u.t. 52¾ yrs., g.r. 13*l.*, y.r. 68*l.* 800
10, 12, and 14, Manor-gr., f., w.r. 63*l.* 14s. 700
23, 25, and 27, Manor-gr. (S), u.t. 48 yrs., g.r. 15*l.* 8s., w.r. 96*l.* 4s. 580
Peckham.—65, Queen's-rd. (S), u.t. 47½ yrs., g.r. 7*l.* 10s., y.r. 50*l.* 600
37, 39, and 41, 47, and 57, Parkstone-rd., u.t. 62½ yrs., g.r. 26*l.* 5s., w.r. 159*l.* 1,150
Walthamstow.—51 and 53, Somer's-rd., u.t. 77 yrs., g.r. 13*l.*, w.r. 54*l.* 12s. 355
Walworth.—15 to 22, Queen's-row, area 14,300 ft., f., y.r. 285*l.* 3,500

April 18.—By HENRY CHAPMAN & Co.

Marylebone.—59 and 59A, Weymouth-st., and shop adjoining, u.t. 32 yrs., g.r. 30*l.*, y.r. 260*l.* 2,200
61, Weymouth-st., u.t. 32 yrs., g.r. 30*l.*, y.r. 140*l.* 1,140
Edgware-rd.—64 and 66, Richmond-st.; also 92, Salisbury-st. (S), u.t. 19 yrs., g.r. 42*l.* 15s., w.r. 180*l.* 350
Kilburn.—83, 84, and 85, Palmerston-rd., u.t. 61 yrs., g.r. nil., w.r. 145*l.* 17s. 4d. 1,210

By FORTESCUE & Co.

Battersea.—31, Ingrave-st., u.t. 47 yrs., g.r. 4*l.*, w.r. 33*l.* 16s. 250
Chelsea.—85, Beaufort-st., u.t. 12½ yrs., g.r. 4*l.*, y.r. 34*l.* 130
4 and 5, Lackland-ter., f., w.r. 67*l.* 12s. 700
4a and 5a, Lackland-ter., and 23, World's End-passage, f., w.r. 55*l.* 18s. 560
Wandsworth.—14, Elmsleigh-rd., u.t. 81 yrs., g.r. 7*l.*, e.r. 3*l.* 315
220, Merton-rd., u.t. 49½ yrs., g.r. 5*l.*, y.r. 28*l.* 250
27, 29, and 35, Tonsley Hill, u.t. 60 yrs., g.r. 12*l.*, y.r. 90*l.* 8s. 910
35 and 37, Tonsley-pl., f., w.r. 57*l.* 4s. 750
Melody-rd., Victoria Hall, f., y.r. 52*l.* (including organ, fittings, and fixtures) 1,000
Battersea.—25, Dutfield-st., u.t. 50½ yrs., g.r. 4*l.*, w.r. 31*l.* 4s. 200

By C. GERRETT & Co.

Norwood.—139 and 141, Portland-rd., u.t. 56 yrs., g.r. 15*l.*, e.r. 70*l.* 500

By MARTIN, CLARKE, & Co.

Great Wilbraham, Cambs.—The Ivies, area 2 acres, f., y.r. 55*l.* 1,000
Dawson's Cottages (four), area 1 acre, y.r. 16*l.* 360

By OLDEN, SON, & OLLEY.

Wimbledon.—30, South Pk.-rd., f., y.r. 32*l.* 450

By T. B. WESTACOTT.

Camden Town.—5 and 7, St. Paul's-rd., u.t. 42 yrs., g.r. 14*l.*, y.r. 90*l.* 915

Canonbury.—17, Canonbury-st., u.t. 16½ yrs., g.r. 6*l.*, y.r. 32*l.* £200
Holloway.—114, Sussex-rd., u.t. 15½ yrs., g.r. 5*l.* 5s., y.r. 38*l.* 340

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 11 6	per 1,000 alongside,	in river
Rough Stocks and Grizzles	1 9 6	,, ,,	,, ,,
Facing Stocks	2 12 0	,, ,,	,, ,,
Shippers	2 5 0	,, ,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts ..	1 12 0	,, ,,	,, ,,
Best Fareham Red	3 12 0	,, ,,	,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,, ,,	,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,,	,,
Do., Bullnose	4 10 0	,, ,,	,,
Best Stourbridge Fire Bricks	4 5 6	,, ,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers.....	13 0 0	,, ,,	,, ,,
Headers	12 0 0	,, ,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,,	,, ,,
Double Stretchers	19 0 0	,, ,,	,, ,,
Double Headers..	16 0 0	,, ,,	,, ,,
One Side and two Ends	19 0 0	,, ,,	,, ,,
Two Sides and one End	20 0 0	,, ,,	,, ,,
Splays, Chamfered, Squints.....	20 0 0	,, ,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,, ,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,, ,,	,, ,,
Double Stretchers	15 0 0	,, ,,	,, ,,
Double Headers..	14 0 0	,, ,,	,, ,,
One Side and two Ends	15 0 0	,, ,,	,, ,,
Two Sides and one End	15 0 0	,, ,,	,, ,,
Splays, Chamfered, Squints.....	14 0 0	,, ,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.
Thames and Pit Sand	7	3 per yard,	delivered.
Thames Ballast	6 0	,,	,,
Best Portland Cement	32 0	per ton,	delivered.
Best Ground Blue Lias Lime..	25 0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. od. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
Ancaster in blocks	1 11	per ft. cube,	deld. rly. depot
Bath ,, ...	1 7	,,	,,
Farleigh Down Bath ..	1 8	,,	,,
Beer in blocks	1 6	,,	,,
Grinshill ,, ...	1 10	,,	,,
Brown Portland in blocks	2	,,	,,
Darley Dale in blocks..	2 4	,,	,,
Red Corsehill ,,	2 5	,,	,,
Closeburn Red Freestone	2 3	,,	,,
Red Mansfield ,,	2 4	,,	,,
Hard York in blocks ..	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup)	2 8	per ft. super. at rly. depôt.	
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,	
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,	
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,	
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt.	
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.	
,, ,, ,, 3 in. do.	1 2½	,, ,,	

SLATES.

in.	in.	£ s. d.		
20	10 best blue Bangor..	12 0 0	per 1000 of 1200 at rly. dep.	
,,	best seconds ,,	11 10 0	,,	,,
16	8 best ,,	6 15 0	,,	,,
20	10 best blue Portmadoc	11 5 0	,,	,,
16	8 best blue Portmadoc	6 0 0	,,	,,
20	10 best Eureka unfading green....	12 2 6	,,	,,
16	8 ,, ,,	7 5 0	,,	,,
20	10 permanent green	10 5 0	,,	,,
16	8 ,, ,,	5 17 6	,,	,,

[See also p. 435.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*New Municipal Offices	Crewe Corporation	50*l.* and 25*l.*	June 12
*Homes for Nurses	Hartshill (Stoke-on-Trent)	.....	June 16
*Higher Grade School	West Hartlepool School Board	75*l.* and 35*l.*	June 27

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Warehouse, Dufftown	.....	C. C. Doig, Architect, Elgin	April 29
Additions to House, Oakworth-road, Keighley	.....	W. H. & A. Sudgen, Architects, Keighley	do.
Schools, Cwmystwyth, Wales	.....	J. A. Jones, Architect, 7, Queen's-terrace, Aberystwith	do.
Boiler House, &c., Legrams Mills, Bradford	.....	Moore & Crabtree, Architects, York Chambers, Keighley	do.
Rectory, Ballymore, Ireland	.....	R. E. Buchanan, Civil Engineer, Castle-street, Londonderry	do.
Road and Sewer Works	Folkestone Corporation	A. E. Nichols, Borough Engineer, Town Hall, Folkestone	do.
Sewage Disposal Works, Craghead	Lanchester R.D.C.	J. E. Lupton, Surveyor, Lanchester	do.
Twenty-two Cottages, Aberbeeg, Wales	Building Club	G. C. Hillard, Architect, Abertillery, Mon.	do.
School House	Clackmannan School Board	T. Frame & Son, Architects, 43, Mill-street, Alloa	do.
*Stone Coping and Landings, Tar Paving Materials, &c	London County Council	Parks Department, L. C. C., 11, Regent-street, S.W.	do.
Opera House, Middlesborough	.....	Hope & Maxwell, Architects, New Bridge-st., Newcastle-on-Tyne	April 30
Flints, &c., Arundel, Sussex	.....	A. Holmes, Town Offices, Arundel	do.
Additions to Parish Church, Glass, Aberdeenshire	.....	J. Robertson, Architect, Inverness	do.
Schools, Ashbourne-road, Derby	.....	F. S. Antliff, Architect, Draycott, Derby	do.
Villa, Drumbo, Co. Down	Mr. A. M'Ilroy	H. Seaver, Architect, 128, Royal-avenue, Belfast	do.
Sewers, &c., Bell-lane, Broxbourne	Ware (Herts) R.D.C.	H. J. Jackson, Surveyor, Rye-road, Hoddesdon	do.
Wood Paving	Gravesend Town Council	Borough Surveyor, Town Hall, Gravesend	do.
Surveyor's Materials, Facit, Lancs	Whitworth U.D.C.	T. Biker, Surveyor, Facit	do.
Hospital, Etwall, near Derby	Repton Hospital Committee	A. Eaton, Architect, 6, St. James'-street, Derby	do.
Additions to Station Buildings, Low Fell	North-Eastern Railway Company.	W. Bell, Architect, Central Station, Newcastle	do.
Banking Premises, Darwen-street, Blackburn	Lancs. and Yorks Bank, Limited.	Stones & Stones, Architects, 10, Richmond-terrace, Blackburn	do.
Two Houses, Lancaster Quay, Cork	Mr. W. Kinmouth	W. H. Hill & Son, Architects, 28, South Mall, Cork	do.
*Paving Works and Asphalte Paving	Hove Borough Council	Borough Surveyor, Town Hall, Hove	do.
*Wood Paving Blocks, Tunnel Gardens, E.	London County Council	Parks Department, L. C. C., 11, Regent-street, S.W.	do.
Rebuilding the Seaton Beach Hotel, Exeter	.....	E. H. Harbottle & Son, Architects, Exeter	May 1
Pair of Cottages, Wickford, Essex	.....	F. Whitmore, Architect, Chelmsford	do.
Twenty-two Double Cottages, Geill Crag Estate	Tylery Building Club	G. C. Heillard, Architect, Abertillery, Mon	do.
Two Houses, Aspatria, Cumberland	Thompson & Moore	R. Berwick, 35, Lawson-street, Aspatria	do.
*Making-up Roads	Ealing Town Council	Council's Engineer, Town Hall, Ealing, W.	do.
Residence, Fairwater-road, Llandaff	.....	G. E. Halliday, Architect, Cardiff	May 2
House, Uppleby, Easingwold, Yorks	.....	J. F. Todd, Architect, Uppleby, Easingwold	do.
Additions to Workhouse	Bridgend (Glam.) Guardians	P. J. Thomas, Architect, Bridgend	do.
Granite Road Metal	Ashford (Kent) U.D.C.	W. Terrill, Architect, North-street, Ashford	do.
Surveyor's Materials	Eastbourne R.D.C.	T. E. V. Kirtlan, 82, Terminus-road, Eastbourne	do.
Schools, Ventonleague, near Hayle Cornwell	.....	S. Hill, Architect, Green-lane, Redruth	May 3
Cottage, Flushing, Falmouth	Mr. J. Crossman	H. W. Collins, Architect, 23, Church-street, Falmouth	do.
Water Supply Works	Tadcaster R.D.C.	Bromet & Thorman, Engineers, Tadcaster	do.
Farm Buildings, Chadwell Heath	West Ham Town Council	Borough Engineer, Town Hall, West Ham	do.
Additions to House, Harrington, Cumberland	.....	W. G. Scott & Co., Architects, Victoria-buildings, Workington	May 5
House, &c., near Aberporth, Wales	.....	D. Morris, Surveyor, Cardigan	do.
Labourers' Dwellings	Burton-upon-Trent Corporation	G. T. Lynam, Borough Surveyor, Burton-on-Trent	do.
Additions, to School, Lorne-street	Bradford School Board	T. Garbutt, School Board Offices, Bradford	do.
*General Paving Works	Stepney Borough Council	Council's Engineer, 15, Great Alie-street, Whitechapel, E.	do.
*Making up Heathville-road, N.	Islington Borough Council	Council's Engineer, Town Hall, Upper-street, N.	do.
*Broken Granite, Kerbing, and Tar-Paving Pathway	Loughton U.D.C.	Council's Surveyor, Loughton, Essex	do.
Road Works, Bolton-road	Windsor Town Council	E. C. Durant, 32, Park-street, Windsor	May 6
Road Metal, &c.	Helton-le-Hole (Durham) U.D.C.	J. Harding, Surveyor, Helton-le-Hole	do.
*Extension of Boiler House at Osborne-street	Borough of Colchester	Borough Engineer, Town Hall, Colchester	May 7
Chapel, Callington, Cornwall	.....	Rev. D. Watson, Launceston-road, Callington	do.
*Reconstructing Roadway, North-Eastern Fever Hosp.	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	May 8
Sewerage Works	Derby Corporation	J. Mansergh & Sons, Civil Engineers, 5, Victoria-st., Westminster	do.
*Alterations to County Courthouse, Londonderry	Londonderry County Council	The Secretary to County Council, Londonderry	do.
*Re-building Bridge over River Beane	Hertford R.D.C.	Jas. Farley, Surveyor, Old Cross, Hertford	May 9
*Extensions, &c., to Police Court, Loughborough	Leicestershire County Council	S. P. Pick, Architect, 6, Millstone-lane, Leicester	May 10
*Eight Transformer Chambers	West Ham Council	Council's Engineer, Town Hall, West Ham, E.	May 13
*Dust Destructor Buildings	Kingston-on-Thames Corporation	Borough Surveyor, Kingston-on-Thames	do.
*Storage Reservoir at Barnattin	Drogheda Corporation Waterwrks.	G. N. Kelly, Civil Engineer, Gas and Water Offices, Drogheda	do.
*Buildings at King's-road Power Station, &c.	St. Pancras Borough Council	Electricity Department Offices, 57, Pratt-street, N.W.	do.
*Gasholder Tank	Darlington Corporation	H. C. Hawksley, Engineer, 30, Great George-street, S.W.	May 21
Two Houses and Two Shops, Dewsbury-road, Leeds	.....	Buttery & Bird, Architects, Albion Walk, Leeds	No date
Hotel and Two Shops, Bolsover, near Chesterfield	.....	W. H. Wagstaff, Civil Engineer, 57, Saltergate, Chesterfield	do.
Church and Schools, Durham	.....	W. J. Morley & Son, Architects, Swan Arcade, Bradford	do.
House, Oxenhope, Yorks	.....	Moore & Crabtree, Architects, York Chambers, Keighley	do.
Shop and Cottages	.....	A. J. Howcroft, Architect, 12, Clegg-street, Oldham	do.
Hotel, Temple Normanton, near Chesterfield	Waterloo (Lancs.) Co-op. Society.	W. H. Wagstaff, Civil Engineer, 57, Saltergate, Chesterfield	do.
Lodge	.....	Settle & Farmer, Architect, Ulverston	do.
House, Hungerford	Ulverston Hospital Board	W. H. Bell, Architect, The Market Place, Newbury	do.
*Alterations, &c., Royal Berkshire Hospital, Reading	Mr. E. Love	Ruault & Young, 17, Southampton-street, Bloomsbury	do.
*Painting, Colouring, &c., Works, North Aldershot	The Commitee	Royal Engineers Office, North Aldershot	do.
	War Department		

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Assistant Clerk of Works	Wandsworth & Clapham Union	2*l.* 10*s.* per week	April 30
*Foreman of Street Works	Stepney Borough Council	2*l.* 10*s.* per week	May 1
*Engineering Assistant	Fulham Borough Council	150*l.*	May 3
*Manual Training Instructors	School Board for London	100*l.*	May 8
*Assistant Manual Training Instructors	do.	80*l.*	do.

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv.* *Contracts, pp. iv. vi. viii. & x.* *Public Appointments, xxi.*

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PRICES CURRENT (*Continued*).

TILES.

	s. d.		
Best plain red roofing tiles	41 6	per 1,000, at rly. depôt.	
Hip and valley tiles	3 7	per doz.	,, ,,
Best Broseley tiles	48 6	per 1,000	,, ,,
Hip and valley tiles	4 0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,, ,,
Do. ornamental Do.	60 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3 9	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 0	per 1,000	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles	3 8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 0 0
Deals: best 3 by 9	13 10 0	15 0 0
Battens: best 2½ by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	10 10	11 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2 in. by 4½ in. and 2 in by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft.)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
,, 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
,, ,, ,, 3 in. by 9 in.	12 0 0	13 0 0
,, ,, ,, battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
¾ in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6

Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Common Bars	7 15 0	8 5 0
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 10 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	12 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g.	16 0 0	- - -
,, ,, 22 g. and 24 g.	16 10 0	- - -
,, ,, 26 g.	18 0 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 0 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 5 0	9 15 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 5 0	- - -
Pipe in coils	14 15 0	- - -
Soil Pipe	17 5 0	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian ,,	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0	- - -
Thin ,,	0 1 1½	- - -
Copper nails ,,	0 1 1½	- - -
BRASS— Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3½	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths	3d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, fourths	4d. ,, ,,
32 oz. thirds	5½d. ,, ,,
,, fourths	5d. ,, ,,
Fluted sheet, 15 oz.	3d. ,, ,,
,, 21 ,,	4d. ,, ,,
½ Hartley's Rolled Plate	2d. ,, ,,
⅝ ,, ,, ,,	2½d. ,, ,,
¾ ,, ,, ,,	2¾d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 8
,, ,, ,, in barrels	,,	0 2 9
,, ,, ,, in drums	,,	0 2 11
Boiled ,, ,, in pipes	,,	0 2 10
,, ,, ,, in barrels	,,	0 2 11
,, ,, ,, in drums	,,	0 3 1
Turpentine, in barrels	,,	0 2 8
,, in drums	,,	0 2 10
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	,,	20 10 0
Best Linseed Oil Putty	per cwt.	0 8 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

"Cheshire Cheese" (We cannot answer the question. It is probably, from your description, an obsolete term, of which it would be difficult to find the precise meaning now).—J. B. R. (below our limit).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BARNES.—For Castlenau School extension, for Barnes School Board. Mr. C. Innes, architect, 50, Cannon-street, E.C.:—

Houghton & Co.	£2,132	W. H. Cooper	£1,597
Martin, Wells, & Co., Ltd.	1,850	Barrett & Power	1,578
H. Roffey	1,790	J. W. Brooking	1,577
Chessum & Sons	1,743	Adamson & Sons	1,575
Wm. Lowe	1,680	Hibberd Bros., Ltd.	1,543
B. E. Nightingale	1,672	Viney & Stone	1,537
W. J. Renshaw	1,649	Gaze & Sons	1,529
Richards & Co.	1,640	Wm. Blackburn	1,500
Lathey Bros.	1,633	Speechley & Smith	1,498
W. Keys	1,630	Foster Bros.	1,494
J. Knight	1,625	Hurt & Son*	1,460

BARROW-IN-FURNESS.—For the enlargement of school, Cambridge-street, for the School Board. Mr. H. T. Fowler, architect, Ramsden-square, Barrow:—

Excavating, Draining, and Bricklaying.

J. H. Neal, Abbey-road, Barrow	£1,994 10 0
Stonemasonry.	
W. W. Fairbairn, Rawlinson-street, Barrow	76 10 3
Carpentry and Joinery.	
Thomas Slee, Warwick-street, Barrow	520 0 0
Slating and Plastering.	
James Walker, School-street, Barrow	318 0 0
Plumbing, Glazing, and Painting.	
J. E. Goddard, Rawlinson-street, Barrow	279 6 3
Total	£2,488 6 6

BEXHILL.—For the supply of Kentish rag macadam, for the Urban District Council. Mr. Geo. Ball, C.E., Town Hall, Bexhill:—

	s. d.		s. d.
Whitwich Granite Co.	15 0	Benster & Son	11 7
Chittenden & Simmons	11 11	H. L. Cooper	11 0
Hughes & Co.	11 10	W. Hudson	10 11
		L. Sommerfeld, London*	10 8

CELLARDYKE (N.B.)—For the erection of harbour works, for the Town Council and Burgh of Kilrenny. Mr. W. A. Baird Laing, C.E., 13, George-street, Edinburgh. Quantities by engineer:—

D. & S. Stratton	£3,346 0 0	Brebner & Co.	£1,671 0 0
Alex. Cameran	2,550 0 0	Adams & Co., Glasgow*	1,657 8 4
John Martin	1,678 17 0		

CHESTERFIELD.—For the supply of broken slag (about 2,350 tons), Clown, for the Rural District Council. Mr. E. H. Barber, surveyor, Hollin Hill, Clown, Chesterfield:—

	Clown Station. per ton. s. d.	Whitwell Station. per ton. s. d.	Creswell Station. per ton. s. d.	At Works. per ton. s. d.
Staveley Coal and Iron Co., Ltd., Chesterfield	3 10*	4 4*	4 3*	—
Rimshaw Iron Co., Rimshaw	3 6	4 0	3 9	—
Whitworth & Co.	4 5	4 4	4 4	—
Rimshaw Iron Co.	—	—	—	2 3*

CLUTTON (Somerset).—For the erection of school buildings and residence, for the School Board. Mr. W. F. Bird, architect, Midsomer Norton. Quantities by the architect:—

S. Dedimead	£5,790 0	W. Tovey	£1,819 10
T. Foster	5,414 0	John Flower	4,071 0
Orchard & Son	5,177 0	Wills & Sons	4,000 0
Chancellor & Sons	4,980 0	E. Walters, Bristol	3 830 0
Hayes & Son	4,919 0		

DOVER.—For the execution of road works, Union-road, for the Town Council. Mr. H. E. Stilgoe, C.E., Maison Dieu House, Dover:—

Austen & Lewis	£549 11 6	G. Munro, Dover*	£495 9 5

DRONFIELD (Derbyshire).—For making-up Victoria-street, &c., for the Urban District Council. Mr. T. H. Atkinson, Surveyor, Council Offices, Dronfield. Quantities by the Surveyor:—

Making-Up of Victoria-street.

Davinson & Son	£270 1 9	R. Bingham, Dronfield, Sheffield*	£210 0 0
Margenison & Sons	243 11 0	J. Glithro	200 0 0
F. Margenison	218 0 0		
Holmes & Son	213 0 0		

[Surveyor's estimate .... £225]

For a Short Length of Sewer in West-street.

F. Margenison	£31 15 6	R. Bingham, Dronfield*	£18 10 0
Davinson & Son	31 4 0	J. Glithro	23 19 0
Holmes & Son	31 0 0		
Margenison & Son	29 11 0		

[*See also next page.*

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ERITH (Kent).—For the execution of private street works, Norman-road, &c., Belvedere, for the Urban District Council :—

Thair & Co.	£3134 12 6	Road Maintenance Co.	£2,514 3 0
Laurence & Thacker	2,880 1 9	Wilson, Bader, & Co.	2,442 10 2
A. T. Catley	2,780 0 0	W. H. Wheeler	2,336 8 7
Free & Son	2,749 2 5	R. Ballard,	
G. Bell	2,630 2 4	Child's Hill, N.†	2,312 5 10
T. Adams	2,619 2 4		

[Surveyor's estimate, £2,467 9 9.]

GOSPORT (Hants).—For the erection of a new Fire Brigade Station, for the Gosport and Alverstoke Urban District Council. Mr. H. Frost, Surveyor to the Council :—

G. M. & F. E. Lane	£1,670	C. F. E Lear	£1 639
C. M. Dash	1,659	John Hunt*	1,595
M. Dugan	1,650		

HARWICH (Essex).—For kerbing, paving, &c., part of King's Quay-street, for the Town Council. Mr. Henry Ditcham, Borough Surveyor, Town Hall, Harwich :—

Mackenzie & Son	£445 6 0	E. E. Newton	£364 6 9
T. Brewster	389 15 0	Acme Wood Flooring Co.	354 0 0
Griffiths & Co.	367 0 0		

[Surveyor's estimate, £313. Work to be done by own staff.]

HATCHAM.—For alterations to No. 63, Canterbury-road, Hatcham, for Messrs. John Dicks. Mr. Delmé G. Mootham, architect, Effingham House, Arundel-street, Strand :—

First Contract.

W. H. Drake	£5,600	William Downs	£5,438
Martin Wells & Co.	5,499	Walter Wallis	5,350
Andrews & Co.	5,473	John Jarvis	5,270

NEWCASTLE-ON-TYNE.—For the erection of shops and offices for Mr. R. Emmerson. Mr. B. F. Simpson, architect, 12, Grey-street, Newcastle-on-Tyne. Quantities by the architect :—

J. C. Hope	£35,944 9 8	S. Sheriff	£32,399 0 0
T. & W. Lowry	35,583 0 0	J. & G. Douglass	31,382 0 7
I. Bewlay	35,218 3 9	Parkinson & Son, Ltd.	32,079 0 0
T. Weatheritt	34,250 0 0	J. L. Miller	31,152 2 2
S. Easten	34,100 0 0	T. P. Shaftoe	30,833 12 0
G. H. Mauchlen	33,051 10 0	W. T. Weir, Howdon*	30,650 0 0
Middlemiss Bros.	33,000 0 0		

NEWCASTLE (Staffs.).—For the erection of residence and stabling, Lancaster-road, Newcastle, for Mrs. Peake. Messrs. Mosley & Scrivener, Fish-street, Northampton :—

	For House.	Stable.	Boundary Walls.
J. Heath	£2,300 0	£305 0	£99
W. Cooke	2,101 10	292 5	91
Meikeljohn & Son	2,100 0	265 0	80
Tompkins & Bettelly	2,097 0	269 0	97
Bennett Bros.	2,000 0	279 0	89
T. R. Yoxall	1,990 0	270 0	113
T. Godwin, Hanley†	1,922 0	256 0	102

POOLE.—For additions to schools, Lagland-street, for the trustees. Mr. H. F. J. Barnes, architect, Towngate-street, Poole :—

	Classroom.	Hat and Cloakroom.
T. C. Rigler	£167 0	£38 0
H. James	160 10	47 15
Burt & Vick	160 0	52 10
W. H. Gray, Poole‡	139 10	49 10

‡ Accepted for classroom.

NEWMARKET. — Workhouse extension, for the Guardians. Messrs. Holland & Sons, architects, High-street, Newmarket. Mr. S. J. Thacker, 90, High Holborn, London, W.C. :—

Kettering Co-operative Builders, Ltd.	£33,773 0	J. G. Corvell	£26,950 0
J. S. Kimberley	30,117 0	Chas. Roper	26,787 10
Norris & Sons	29,600 0	A. J. Bateman	26,777 0
F. C. Fhurman	28,998 0	Sidney Kenney	25,880 0
J. McKay	28,600 0	Maple & Co.	25,873 0
J. Cracknell	28,320 0	H. J. Linzell	25,870 0
F. G. Minter	28,280 0	William Saint	25,800 0
H. Vickers	28,151 0	Grimwood & Sons	25,697 0
Oak Building Co.	28,096 0	Kerridge & Shaw	25,463 0
James J. Wise	27,450 0	Grimwood & Sons, Sudbury, Suffolk†	23,989 0
Coulson & Lofts	26,990 0	Shillitoe & Sons	22,000 0

SANDBACH.—For the erection of a villa for the Sandbach Wesleyan Chapel Trustees. Mr. Alfred Price, architect, Sandbach :—

J. Stringer	£765 10	Birchall Bros., Middlewich*	£598 0
W. Street	625 0	A. E. Lee	596 10

[Architect's estimate, £600.]

SWINDON.—For the erection of Primitive Methodist Sunday school premises, Manchester-road. Mr. R. J. Beswick, architect, 35, Regent-street, Swindon :—

J. Williams	£1,084 0	Tydeman Bros.	£897 10
A. J. Colborne	995 0	T. Colborne	850 0
Spackman Bros.	957 0	R. J. Leighfield*	845 0

[All of Swindon].

TILBURY DOCK (Essex).—For the erection of two shops. Mr. Christopher M. Shiner, architect, 6, 7, and 8, Crutched Friars, E.C. :—

J. Brown* £782

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The Builder.

VOL. LXXXII.—No. 3091. MAY 3, 1902.

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Architecture at the Royal Academy.

THE first impression one receives of the architectural room in this year's Academy is that of a heterogeneous miscellany rather than an organised exhibition of current architectural art. There is no definite attempt at grouping either of subject or authors, save that one or two favoured individuals have their drawings hung together, nor is the collection so arranged as to give any idea of orderly arrangement. There is a striking deficiency of important buildings, and those that are included, as Messrs. Aston Webb and Ingress Bell's design for the new University of Birmingham, and Messrs. Ernest Runtz & Co.'s New Gaiety Theatre and Restaurant in the Strand, are hung above the line. So also is Messrs. Lanchester, Stewart, & Rickards' unsuccessful competition design for the Manchester Fire Station, although in this case the scale and size of the drawing, as well as the fact of failure in the competition, might be held to justify the position—an excuse that could not be made with regard to Messrs. Webb & Bell's drawing, a sheet of geometrical elevations and plans that it is practically impossible to to see properly in its lofty situation. Fortunately, we are able to bring it more conveniently to view in the illustration in our present issue.

The drawings on the line and below it give countenance to the popular cynical dictum that a lucky fitness of frame is the most important desideratum for a position on the walls of the architectural room. Other qualifications necessary would seem to be eccentricity and mediocrity, to judge from much of the work exhibited. Certainly eccentricity, both of design and draughtsmanship, is strongly in evidence this year.

Ecclesiastical work is well represented in the present Academy, and an uninformed visitor might be pardoned for forming the erroneous conclusion that such work includes a large proportion of present architectural practice in England. This is, however, but a reflex swing of the pendulum, which, within recent memory, has gone too far in the exclusion of church work from the Academy walls.

The members of the Academy have for the most part been modest in their demands upon the wall space of the architectural room. Of the R.A s Mr. Norman Shaw is unrepresented by designs under his own name, though at least one influenced by him is hung. Mr. Alfred Waterhouse also does not exhibit. Professor Aitchison has sent a design for "City offices," which cannot be said to be worthy of his position. Mr. Jackson has one drawing, a "Design for an Organ Loft and Screen in the Church of St. Mary-the-Virgin, Oxford," which would be commonplace but for the callous indifference to proportion which is to be found in much of Mr. Jackson's work, but is here almost exceptional in its crudity. The screen consists of three stone arches, with a wood groined fan and front over them. The three arches are alike in design except that, as shown on the perspective, the centre bay is slightly wider than those at the sides. Over each arch are three bays of the groined fan and six panels of the vertical front, those over the centre arch following the relation of this to the others in being slightly but perceptibly wider. The effect is most unpleasant and distracting. One feels that either the side or the centre is wrong in its proportion, but cannot say which, and the result in execution must be an instinctive apprehension that the builder has bungled the setting out. Looking at the design, one is inclined to surmise that the author felt that the centre required emphasis, but would not take the trouble to give that emphasis in a satisfactory manner. The organ case itself does not rise above the commonplace, with its three towers on crude corbelling. Mr. Jackson also exhibits full-size models of stall ends for Giggleswick School Chapel with seated figures of evangelists, modelled by Mr. T. Carter, somewhat strained in their attempt to convey inspiration. Here again the comparatively enormous size of crockets and finials is in its disregard of proportion the only variation on the very ordinary type of carved treatment that is followed.

Of the Associates' work we have already mentioned the only example of Mr. Aston Webb's artistic handling. Mr. Belcher is represented by five drawings and a model. Of the drawings two are of formal gardens; the one at Tapeley Park, North Devon, an adjunct to a formal house, the other a terrace garden at Cornbury Park, Oxon, ending in a Lord Burlington fashion of colonnade, both admirable and clever, with the rhythmical arrangement that is essential to prevent insipidity in this type of garden. "Guildown Grange, Guildford," is a quaintly picturesque unsymmetrical composition, shown in a coloured perspective indicating purple brick walls, with bright red quoins and arches, tile roofs, and white painted woodwork in cornice, loggia, doors, and windows, which combine to produce one of the most charming domestic designs that Mr. Belcher has given us. Business premises at No. 88, Fleet-street shows a victory of plate-glass over art until the second floor is reached, when art, thus beaten back, is quiet and undemonstrative. The interior of the board-room at Electra House is in low-toned grey colour, with Doric columns, above which are the dominant features of the design, consoles of abnormal size carrying a curved coffered ceiling. Mr. Belcher's model is a ½-in. detail in plaster of the dome and upper part of the central feature over the entrance of Electra House; it would be more convincing if raised to a height corresponding in scale to its actual position in execution.

Mr. Bodley has two drawings only, one, a perspective in pen and ink of his new church, Holy Trinity, Kensington, and the other the monument to the late Duke of Westminster in Ecclestone Church. The former appears to be a short and wide building, in that phase of Decorated which Mr. Bodley so well knows how to handle, and suggests that the necessities of the case forced the designer to utilise every inch of a limited site. Hence the buttresses are of the least possible projection, and instead of a tower there is no more than a cot for two bells on the west wall. The monument is a scholarly and richly-treated tomb for a recumbent effigy with a flat wooden canopy over extending from pier to pier of the arcade in which the monument is placed.

Amongst other church work, Mr. Caröe shows his design for the memorial slab to the late J. L. Pearson, R.A., in Westminster Abbey, a design with sufficient originality but restrained and dignified. In St. John's Church, Byfleet, also, Mr. Caröe observes a quiet restraint that gives an eminently suitable character to a suburban church. In his competition design for Lady Chapel to St.

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Patrick's Cathedral, New York, he has rather let his exuberance of invention run away with him. The hexagonal plan, with an inner range of detached shafts, has tempted the designer into over-elaboration, particularly in his treatment of the vaulting, which is overloaded with a multiplication of ribs and severies.

Mr. G. H. Fellowes Prynne shows two of his characteristic interiors with the highly-elaborated screens of which he makes so much. In the church of St. John the Divine, Sidcup, the screen is an elaborate composition of stone carried to a considerable height and surmounted with a complete rood. In Christ Church, Lower Sydenham, the screen is carried the whole height of the building to the arch concentric with the barrel roof, and filled with tracery in the manner with which Mr. Prynne has made us now familiar. Both churches are treated internally with red brick and white stone.

Of St. Anne's Cathedral, Leeds, Mr. J. H. Eastwood shows us an exterior view of his really remarkable design and a detail of the great High Altar and baldacchino. Another elaborate design for a reredos is that by Mr. Walter J. Tapper for Grantham Parish Church, and of somewhat similar character, with a wealth of carving, is Mr. Harold Bailey's design for the reredos in Beckingham Church.

Messrs. Hicks & Charlewood have sent a design for a large town church in St. Chad's, Bensham, near Gateshead, of which the central feature is an octagonal central tower. Mr. Gerald Horsley's new church at Longsdon, Leek, Staffordshire, is simply and broadly treated with a bold western tower of low proportions, and an almost forced reduction of effort. Mr. Temple Moore, in his interior of St. Columba's Church, Middlesbrough, shows an originality which transcends the accepted canon of a central east window by adopting a central pier and twin windows. A further departure from customary modern type is the elevation of the altar to provide for a crypt and lower altar somewhat on the lines of S. Ambrogio, Milan, and other very early Christian churches. A good example of the modern type of church treatment is the design for a memorial church by Mr. Herbert Raine, of which is exhibited the west front. Of different type, more traditional in detail but still original in composition, is Mr. Bidlake's west front of St. Agatha's Church, Birmingham, shown in a geometrical elevation, and in which exception might legitimately be taken to the conflict between the belfry stage of the tower and the large window below. In their design for a new church in Essex, Messrs. Freeman & Ogilvy have sought character by constructing the nave arcade in timber, uniting with the construction of the roof, nave, and aisle. Another design for an east country church is that by Mr. Geoffry Lucas, for Manningtree, a quietly picturesque building of modest pretensions, but of considerable ability. A clever colour decoration scheme is that by Messrs. Nicholson & Corlette, for St. Matthew's, Yiewsley, in which a complete scheme of iconography is fully worked out and shown by interior elevations to ¼-inch scale.

The ecclesiastical work cannot be accused of eccentricity, though originality of treatment is by no means wanting.

Eccentricity in draughtsmanship is paramount in Mr. Inigo Thomas's suggested treatment of the Mall and approaches to Buckingham Palace, in which, with an affected archaism, plans and elevations are jumbled together with an elaborate travesty of the Royal Arms. The problem has been so much better solved by the designs submitted in the competition for the Queen Victoria memorial that this weak echo can hardly be regarded as other than a very feeble joke. Another eccentric drawing is that for a Cheshire house by Mr. A. E. Corbett, in which a meritorious design is spoilt by violent colouring. Another example of affectation is the drawing of a solicitor's office at Oldham by Mr. Edgar Wood, in which we can only suppose that the variety of sixteenth century costumes in which the figures in front of the house are clad is intended to emblematically indicate that the solicitor's clients are to be found in all ranks of Society, a fact that modern garb would have difficulty in expressing. In Mr. Hart's drawing of Ridgemount, Enfield, there is a suggestion of evening twilight as far as colour is concerned, which is not consistently borne out by the shadows. Mr. A. E. Corbett has another instance of eccentric draughtsmanship in his design for a club town house, which relies not upon its easily recognised ability of design, but screams for attention by the use of lines $\frac{1}{16}$ in. broad.

It is pleasant to turn from such strident shrieks to a design like that for the new wing to Ascot Priory by Mr. Leonard Stokes, in which originality without eccentricity, knowledge without pedantry, refinement without loss of virility, thought without labour, are evident in every line and every detail. In his design for Hill End, Wendover, Mr. Stokes, with quite different *motif*, shows a broadly treated rough-cast house of eighteenth-century flavour, that, as indicated by the small plan, complete with scale and compass, is an eminently suitable home for a busy brain-worker like the owner, Mr. Lawson Walton, K.C., M.P. In the same category with Mr. Stokes' work must be placed Mr. Guy Dawber's design for Westhope Manor, Shropshire, a charming combination of stone, half timber, and rough cast. Messrs. Ernest George & Yeates are represented by Foxcombe, Oxford, a characteristic transformation of a comparatively small house into a country mansion. In the interiors of the Duchess' boudoir and the new dining-room at Welbeck Abbey the same architects show two able examples of different phases of Italian Renaissance, the former of sixteenth century the latter of eighteenth century type.

A strikingly picturesque grouping is to be seen in Mr. Unsworth's design for "The Saracen's Lair, Mayford," whilst Mr. Arnold Mitchell is well represented in his design for the Royal Villa and Golf Pavilion at Le Coq-sur-Mer, Ostend.

Mr. Mountford has only his interior view of the lower hall of the new Sessions House for the City of London.

Mr. Reginald Blomfield has three drawings, the new organ gallery and case for the Chapel of Haileybury College, illustrated in our present issue, and an interior and exterior view of the new entrance and vestibule at Brocklesby Park.

We shall have more to say on some of the other exhibits on another occasion.

NOTES.

The London Water Bill.

THE Parliamentary Committee to which, after its second reading, the London Water Bill was referred, has come up to the present time to some important conclusions. It has decided not to alter the date of the transfer of the undertakings of the Companies, and also to adhere to the provision which eliminates the customary 10 per cent. additional compensation for compulsory purchase. Whether the shareholders are to receive all cash or all stock has been left over for further consideration. It has also been decided that the originally proposed cumbrous number of sixty-nine members on the Board is to be reduced to thirty-five. The very important proviso in regard to compensation can scarcely fail to be regarded as a precedent. There can be no reason why the 10 per cent. compensation should not be applicable to other undertakings, if it is not applicable in the case of the London Water Companies.

Stonehenge Again.

THE Committee appointed by the Wiltshire County Council, consisting of the Marquis of Bath, Mr. Percy Wyndham, and Mr. Fuller, M.P., to investigate the question of right of way to Stonehenge, has now made its Report. The three members arrive at different conclusions. The two former hold that the public have no right of way to the monument, Lord Bath going as far as to say that those who have gone to it are trespassers. Mr. Fuller, on the other hand, holds that there is a right of way, but that it would not be desirable to enter into a legal contest on the subject. It is obvious that this informal inquiry has not, therefore, brought us any nearer to the knowledge of the true legal rights of the public, but we think the Committee are right in their desire to avoid legal proceedings, for, as we have already pointed out, a right of way to a place does not give a right of control over it. The Highway Committee of the County Council have the matter still under their consideration, and it is to be hoped that they will suggest a reopening of negotiations with Sir Edward Antrobus with a view to Stonehenge being vested in the County Council, which is clearly the right body to be trustees of it.

The Hackney Railway Accident.

AS might have been expected, the verdict on the victims of the Hackney railway accident is one of "Accidental death." No amount of care—and none seems to have been wanting in this case—can guard against the existence of a possible concealed flaw in a steel axle. But the jury added a most important rider to the effect that the train might have been stopped sooner had there been means of communication from the passengers in the injured carriage to the engine-driver. This is a subject which the Board of Trade ought to take up in the most decisive manner. Not only ought all carriages in a train to have a means of warning and communication, but it ought to be something much more workmanlike and accessible than the outside communication cord, which is difficult to get at, and on occasions when it has been really wanted has been found not to act or not to secure any attention. One is

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really amazed at the supine manner in which the Board of Trade allow the railway companies to go on shilly-shalling about a matter which seriously concerns the safety of the public. The fear that a too ready means of communication would be abused is not a sufficient excuse. Two or three solid and substantial fines inflicted for wanton use of the communication would soon put a stop to that.

What is a Scaffolding?

THE recent case of "Veazey *v.* Chattle," reported in the Law Reports for this month, far from simplifying this question under the Workmen's Compensation Act, has only created greater doubt. The majority of the Court of Appeal in this case have now held a "crawling-board," *i.e.*, a board with strips of wood nailed across it and which hooks on to a roof ridge, to be a scaffolding. The Master of the Rolls considered the case of "Wood *v.* Walsh," which decided that a ladder was not a scaffolding, over-ruled by the House of Lords in their decision in "Hoddinott *v.* Newton Chambers." Lord Justice Mathew considered this crawling-board not a ladder, intimating that if it had been he would have followed "Wood *v.* Walsh," whilst Lord Justice Stirling considered it a kind of ladder, and, therefore, not a scaffolding. This divergence of opinion on a point of such importance is very unfortunate, and seeing that the House of Lords laid down that the word "scaffolding" must be construed in the common acceptance of the word, as only including anything which could properly be called a scaffolding, we submit it should not be applied to a well-known article complete in itself, such as a ladder or crawling-board, but implies some combination or erection constructed out of such materials as planks, poles, trestles, &c., and to construe the word otherwise can never lead to that finality of decision which the House of Lords laid down was the object especially to be attained.

Tramways.

THE London County Council's Tramway Bill passed the second reading in the House of Commons last week. An instruction to the Select Committee to exclude from the Bill the line from Blackfriars Bridge to Westminster was defeated, and thus after many struggles the House of Commons has at last given permission for a tramway on the Embankment. Considering how regardless Parliament has been of æsthetic considerations in such matters, for example, as the erection of the Public Offices, it was ludicrous for it to endeavour to defeat the Council's scheme on the ground that it would injure the appearance of the Embankment. If this tramway is constructed and gets into working order, it is quite probable that it will lead to the enlargement of the system in the West End of London. Its superiority over omnibuses and underground railways, and the great convenience to the mass of the inhabitants, can scarcely fail to lead to a demand for its enlargement. It could well be continued to Victoria Station, and a branch could conveniently be run up Whitehall to Trafalgar-square; and at any rate the people of London would have the satisfaction of knowing that any profit obtained from it went into the ratepayers' pocket and not into those of American millionaires, as appears likely to be the case with the underground railways.

The Timber Resources of Australia.

ON Wednesday evening last a paper on "The Timber Resources of the Australian Commonwealth" was read before the Society of Arts by Mr. Edward T. Scammell. After briefly describing the principal commercial timbers of Australia, and enumerating their respective uses, Mr. Scammell discussed the methods which he thinks should be adopted to increase and improve the export trade to this country. While recognising that the freight charges must necessarily be heavy in view of the great distance of Australia from Great Britain, Mr. Scammell considers that much may be done in the immediate future to lessen the cost of transport. He says that much harm has been done by the introduction into England of Australian timber which has not been properly selected or seasoned, and in some cases a prejudice has in consequence been created against these timbers which it is difficult to overcome. Mr. Scammell advocates the establishment of a bureau in the City of London where the colonial timbers may be viewed, and where full reliable information relating to their properties and prices may be obtained. We think Mr. Scammell is right when he says that such a bureau in the City would be of much greater commercial utility than a similar establishment at the Imperial Institute. He concluded with an appeal for a systematic consideration of the forestry of the British Empire as a whole, with a view to better conservation and a more intelligent utilisation of our great timber resources. The paper evoked a long and interesting discussion. It was generally agreed that greater care is necessary in the selection and preparation of timber exported to this country, and that the exceptional expansion and contraction of some of the Australian timbers greatly detracts from their practical utility. While, moreover, such timbers as Jarrah and Kauri are likely to prove of great value to Great Britain for special purposes, such as road-paving, there is no immediate prospect of Australian timbers in general replacing those of North America or the Baltic in the British markets.

Highly Superheated Steam.

MR. PENN drew attention to the advantages of superheated steam for marine engines as long ago as the year 1859, but at an early period in the history of superheating it was found that injury resulted if the temperature of steam were raised beyond 400-500 deg. Fahr. Superheaters were practically abandoned about 1870, when steam at higher pressure began to be used and compound engines were generally adopted. These developments enabled economies to be secured more easily than by the employment of low-pressure superheated steam in simple engines. In the present day the limit of efficiency with saturated steam is virtually reached, and engineers are once more taking up the practice of superheating. The Schmidt system is one permitting the use of steam at temperatures over 700 deg. Fahr., and some remarkably satisfactory results have been achieved by its aid on the Continent and in this country. From a Report made last month by Professor J. A. Ewing on some trials of a small triple-expansion engine at Erith, it appears that the steam consumption per kilowatt was reduced to 18·3 lbs. per hour, or 11·4 lbs. per indicated horse-power. As Professor Ewing remarks, this is a particularly satisfactory result in view of the small size of the engine, and of the fact that the boiler imposed a pressure limit of 130 lbs., which was too low to exhibit the full advantage of triple-expansion, or to economically develop the full power of the engine.

Steam Distribution.

OWING to the exigencies of modern hospital and workhouse design, it is often necessary for architects to consider how steam may most suitably be provided in the various isolated buildings of one institution for heating and other purposes. Owing to the large area covered, it is sometimes doubted whether steam can be economically distributed from a central station, while the differences of level often seem to place obstacles in the way of returning water of condensation to the boiler-house. There are many hospitals, well-known to our readers, where central heating stations are in thoroughly satisfactory operation, but nowhere in this country has the distribution of steam been attempted on the gigantic scale exemplified in the United States by the supply of steam to whole cities for industrial and domestic purposes. A smaller but not less interesting plant is to be found on Randall's Island, in the East River, New York. On this site there are sixteen buildings affording shelter for persons who through mental or bodily infirmity are incapable of self support. Quite lately a new central steam heating plant has been installed to replace former separate installations, and to provide for recent additions. The buildings cover an area of something like 23 acres, and some of them are situated on ground too low to permit water of condensation to return by gravity to the boiler-house. A noteworthy feature of the new plant is the adoption of the Paul vacuum system, by which water of condensation is returned to the boiler-house from buildings where gravity furnishes no aid. Some idea of the magnitude of this installation may be gathered from the statement that 30,000 square feet of radiator surface are served by the steam mains, in addition to laundry and cooking appliances and heaters for hot-water supplies.

A Building Site near London.

IN the course of next month will be offered for sale at the Mart about 600 acres of freehold building land, distant eight or nine miles from London. The various properties comprise the Grovelands estate of 300 acres at Winchmore Hill and Southgate, Old Park, 135 acres, at Palmer's Green, with others in the neighbourhood, and lie upon the southern fringe of the old Enfield Chase. A road from Southgate, where stood one of the gates of the Chase, skirts for about two miles Grovelands Park, and then a footpath through a wood on the left hand takes one to Winchmore Hill. The house at Grovelands (consisting of two floors and an attic story) was built in 1797 after John Nash's designs. In vol. i. of George Richardson's "New Vitruvius Britannicus," 1802, are views of the north and east fronts, and two plans of the ground and first floors, dated March 30, 1799, of the house, at that time the seat of Mr. Walker Gray. The east elevation has an Ionic recessed portico between two side

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bays; on the north front is a projecting Ionic portico. In the east side, on the ground floor, are the breakfast parlour and "eating-room," the doors through which into the drawing-room command the window in that room and the prospect beyond. The doors from the drawing-room and library, in the south side, were made to be opened into the jambs, so as to form one apartment upon occasion; and by folding back into recesses some of the bookcases the library and the conservatory could be thrown into one also. The house stands in a grove of trees planted about the lawn, the ground falling towards a large lake, on the remoter margin of which is a coppice wood. Old Park constitutes a portion of the former Frith or Home Park, which, as surveyed in 1650, extended over 553 acres, whereof 100 acres of the best land were then valued at 17s. per acre; in the days of the Commonwealth it furnished 400 oak trees for uses of the navy. Around part of the lawn before the house, rebuilt early in the eighteenth century, are the remains of ancient earthworks, reputedly of Roman origin. The Home Park appertained to Enfield manor-house, the Palace that Edward VI. built for his sister the Princess Elizabeth, most of which was pulled down in 1792. It was bestowed, together with the hop garden (since a farm), upon George Monk, Duke of Albemarle, in 1660; after the death of Christopher, the second Duke, it passed by escheat to the Crown; then the property, having been meanwhile mostly disparked and converted for tillage, was granted by William III. to William Bentinck, first Earl of Portland. It has latterly been owned by the Clayton and Ford families.

The Church Crafts League.

IN two rather out-of-the-way rooms in the Church House at Westminster the Church Crafts League has got together a small but interesting exhibition of work by various artists intended for church decoration. "To set real artists to work upon our churches" is the object for which the Church Crafts League exists; in other words, to get church decoration and furniture out of the hands of the trade ecclesiological dealers. With this aim we are entirely in sympathy; but on the other hand, in the work of artists here exhibited there is perhaps, in some cases, a little too much of eccentricity, or at all events want of repose. Mr. Phillips's "Altar Front," for instance, which comes first in the catalogue, though the front panels are very well treated, is much too ragged and realistic in the carving of the uprights. Mr. Nelson Dawson's lectern eagle is a powerful thing, but here again the stand, though characteristically treated, has a little too much the aspect of mere blacksmith's work, and this over-acted simplicity appears again in his candelabra (21); they are what is called "honest work," but are mean and meagre for a church; and his candlesticks of forged iron (18), good as design, have the bad fault of not standing steady. Among things which belong to the region of a more finished and dignified art are Mr. Goscombe John's low-relief memorial to the late Canon Guy; Mr. Stirling Lee's bas-relief triptych, "Worship Within the Veil"; Mr. Taubman's child angel, forming a portion of a monument—a little kneeling figure with her wings decoratively overlaying the two sides of a pedestal behind; and Miss Rope's charming coloured relief, "Adoration by Children," designed for the chapel of a Children's Hospital; a work which may instructively compared with the commonplace coloured panels of "The Crucifixion" and "The Agony" on the opposite wall, which can certainly hardly raise one's religious feelings higher. Mr. D. G. Walker exhibits a coloured model of his mosaic decoration of the dome of the Greek church at Bayswater, a design which we illustrated in monochrome some time back. Among smaller things we were interested by some specimens of very delicate and artistic embroidery for church purposes by Miss Moira, and by some photographs of metal-work by Mr. Robert Hilton, and of frescoes, &c., by Miss Maude Berry; the decorative painting of Christ and the Baptist by the last-named lady, judging by the photograph, is finely and effectively treated. A photograph of a memorial cross at Braughing, Suffolk, by Mr. John S. Lee, shows what appears to be a picturesque and original treatment of this class of object. There is a small but interesting loan collection of ancient church vestments, plate &c. We may remark that on the day when the Press were specially invited to inspect the collection the numbering and arrangement of the specimens was not complete, which is very inconvenient, as one may wish to comment on an object and be thus unable to identify it.

LETTER FROM PARIS.

THE Société des Amis des Monuments Parisiens have held a special meeting to consider the question of the new lines of boulevards and streets which will very shortly occupy the ground to be left vacant by the suppression of a large portion of the fortifications of Paris. An interesting paper on the æsthetic conditions of the new quarters to be raised between the Porte Maillot and the Porte d'Auteuil, on the site of the fortifications, was read by M. Charles Normand.

A competition is opened between architects for designs for the reconstruction of the Museum of Painting and Sculpture at Nimes.

The Paris Municipal Council has just leased, for a term of ninety-nine years, a large piece of ground on the Boulevard Raspail to the Société de l'Ecole Spéciale d'Architecture, for the purpose of erecting thereon the new important special school for the teaching of architecture.

The newly-formed association of the "Nouveau Paris," which consists of a group of young members of the architectural profession, whose ideas are entirely given up to the culture of modern architecture and the breaking away from all old or classical traditions, has just held its first meeting. Committees were appointed to examine the questions of the transformation of the Champ de Mars, the stations of the new metropolitan railways, the aspect of the boulevards, the suppression of the fortifications, and the proposed competition for business sign-boards and shop-fronts. This society will in most cases be in direct opposition to that of the Amis des Monuments Parisiens, and some interesting discussions will probably ensue.

The Académie des Beaux-Arts, at its last sitting, presided over by M. Jean Paul Laurens, awarded the Prix Duc, of a value of 150*l*., destined to encourage the study of the higher sphere of architecture, to M. Albert Guilbert, for his monument raised to the memory of the victims of the ill-fated Bazar de la Charité, which won for its author the medal of honour in architecture at the Salon of 1900.

A Parisian engineer, M. Casalonga, has submitted to the Société des Ingénieurs Civils de France his scheme for an underground moving platform, which he proposes to install between the Place de la Concorde and the Place de la Bastille, with a return line. The depth at which this line will be placed is much less than that of the metropolitan railways, and will avoid the necessity and the delay of deep staircases for access. The work is estimated at 25,000,000 fr., and this first line will form a portion of a series of lines 30 miles long.

To the loss which the architectural world of Paris has sustained by the death of M. Coquart we have already referred under the head of "Obituary" in our issue of April 19.

The first prize for the annual Chenevard competition at the Ecole des Beaux-Arts was awarded to M. Prevot (pupil of MM. Guadet and Paulin, for his designs for a "Café-Restaurant Concert Populaire," and to M. Jaussely (pupil of MM. Daumet and Esquié), for his design for a "Place du Peuple," both, of these students sharing the honour of the first prize this year.

The *Journal Officiel* publishes the decree authorising the reconstruction of the Imprimerie Nationale in the Rue de la Convention, at a cost of 2,920,000 fr., and the assignment of the buildings and ground in the Rue Vieille-du-Temple, now occupied by this service, to the profit of the Treasury.

The work of excavation just completed for the foundations of the two additional wings to the Bourse at Paris has brought to light a large number of interesting objects of Roman and later art, of bronze and faïence. These will be placed in one of the museums devoted to collections of antiquities discovered at Paris.

The question of the dangers of public and private lifts is now being carefully considered at Paris, and the Minister of the Interior has appointed a special committee of engineers to go into the matter thoroughly.

M. Muntz, member of the Académie des Inscriptions et Belles-Lettres, has submitted an interesting study of the history of the monumental frescoes which adorn the architecture of the Palais des Papes at Avignon. All this work belongs to the fourteenth century, and is due to Italian artists and one or two French artists under Italian inspiration. M. Muntz insists on the desirability of appointing some of the best draughtsmen attached to the service of the Monuments Historiques for the purpose of making exact and skilful copies of the most interesting of these remains.

The inauguration of the exhibition of the artistic and archæological collections coming from the excavations made at Susa by M. de Morgan takes place on May 1 in the Grand Palais des Beaux-Arts. The exhibition will comprise the whole of the results of the excavations, and the objects will be accompanied by maps and sketches made by M. de Morgan on the spot during the work.

A large sum has been voted for the purpose of repairing all the old churches of Paris. With the exception of the work of restoring large portions of the Church of St. Eustache, very little has been done to any of the other churches, but the repair of the churches of St. Gervais, the Madeleine, St. Severin, St. Bernard, St. Augustin, and St. Germain des Prés will be put into hand at once. The work of repairing the façade of the Church of St. Sulpice has been in hand some time already.

The case of the "Tout à l'égout," in which 125 house-owners are summoned for not complying with the recent law enjoining all house-owners to install the water-carriage system in their houses and connect with the sewers, has now come up before the ordinary police-court, with the result that each one of the delinquents has been condemned to pay a fine of one franc, and to proceed at once to execute the work required by the law.

The increase of the statue mania at Paris is receiving the urgent attention of the Commission du Vieux Paris, and it has been decided to request the Prefect of the Seine to take measures to curb as much as possible the enthusiasm of those whose desire is to see every square and public place at Paris adorned with busts or statues, which, in many cases, are of little artistic beauty and often tend to spoil the effect of the open space instead of enhancing it. The Prefect has decided that in future the Commission du Vieux Paris must be consulted on the choice of the sites proposed for the erection of monuments or statues.

A number of new rooms destined specially to the art of the eighteenth century have been opened in the Palace at Versailles. The decoration of these rooms has been carefully restored, and reconstitutes the charming style of the old apartments of the Dauphin, son of Louis XV., a decoration very much spoiled by Louis Philippe when he arranged his collection of portraits. The work of restoration and installation has occupied three years, and great credit is due to M. de Nolhac, the

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curator, for the careful and artistic manner in which the rooms have been arranged and installed to receive the paintings and noted portraits of the eighteenth century. The contents include pictures by Rigaud, Largillière, Coypel, Nattier, Drouais, Boucher, Vigée Lebrun, and other eminent eighteenth-century painters, and sculptures by Houdon, Coysevox, Coustou, &c.

The foundation-stone of the new wings to the Bourse at Paris will very shortly be laid with a certain degree of ceremony. The foundation-stone will contain a casket enclosing a plan, engraved on copper, of the Palais de la Bourse in its completed state, the minutes of the ceremony, some specimens of the money of this year, and a medal engraved by M. Roty.

It is proposed to construct at Paris an establishment to be entitled the American National Institute, destined as a centre for young American artists. The Senate at Washington has under consideration a demand for a credit not to exceed 250,000 dols. for the erection of the suggested Institute. The building would be raised on a piece of ground to be granted by the Paris Municipal Council on the condition that the establishment should pay for its own maintenance. The building would be erected under the supervision of the United States Government.

It is fortunate that the completion of the work on which Dalou was engaged at the time of his death—the Gambetta monument for Bordeaux—was provided for by the great sculptor, who, feeling that he could not live to complete it, had appointed M. Camille Lefèvre to carry it out as sculptor, in conjunction with M. Formigé as architect.

Three new monuments are spoken of in Paris; one to Jules Simon, for which political influence has secured a position on the Place de la Madeleine, where it will take the place of one of Davioud's fountains; an unfortunate decision. It would have been much better if the wish of the Administration had been adopted, to erect the monument on the open space at the entry of the Boulevard Malesherbes. The second monument referred to, which has just been completed by M. Injalbert, is one to Auguste Comte, to be erected on the Place de la Sorbonne, a selection of site which has also been much criticised, since it is not thought that the style of the monument will harmonise at all with the building erected under Richelieu; and it is fortunate that in future the Committee of "Vieux Paris" will be consulted in regard to this question of thrusting new monuments into sites in connexion with ancient buildings; for this Committee has the power to make its influence felt by the Government. The third monument is one designed by M. Lenoir in memory of the composer César Franck, and is to stand in a gothic arch in the square in front of the church of Ste. Clothilde, where Franck was organist for many years. About this monument to an artist there are, fortunately, no political or other disputes.

M. Recipon is just completing the model for a great piece of sculptural decoration intended for the Panthéon, to symbolise the "Autel de la Patrie." This monument is to be something over 40 ft. high. On the plinth, adorned with a frieze of foliage, is the shaft of a column against which is placed a seat of antique form; in its centre is represented "Le Livre de la Loi." Beneath are grouped a Gaul warrior, an artisan, a labourer, and other personages symbolising "La Famille." To right and left are figures personifying Energy, Genius, Labour, &c.; and crowning the composition an imposing figure of "La Patrie" upright upon the column. The general appearance is sufficiently decorative, though rather heavy. M. Recipon is a sculptor who has done some good work in the decoration of the Grand Palais and the Pont Alexandre III, but he is perhaps hardly equal to making the best of a monument of this kind, for which one wanted a Dalou or a Falguière.

A new work by M. Frémiet has just been completed for America—the equestrian statue of Colonel Howard, who distinguished himself in the American War of Independence. It is intended for a site in Baltimore.

Surprise has been expressed that the Department of Fine Arts has delayed for two years to settle the question of the disposal of the fine models of various historical monuments which are for the present deposited at the Trocadéro. These were made under the direction of M. Baudot, Inspecteur-Général des Monuments Diocesains, and were specially designed to illustrate the use of the materials of construction in ancient buildings; they are therefore interesting in a double sense, artistic and technical. Among them are models of the staircase of the Château of Blois; the buttresses of Saint Urbain, Troyes; of Saint Pierre, Beauvais; and of the apse of Nôtre Dame, Puy. The architectural museum of the Trocadéro would seem to be their proper destination.

During the Parliamentary vacancy the refreshment-room of the House is being decorated under the direction of M. Bucquet, architect to the Palais Bourbon. It is now adorned with some splendid panels in grey stoneware, executed at Sèvres, and representing the Four Seasons. The design is by M. Constant Roux. The Municipality of Paris is following suit in decorating the refreshment-room at the Hôtel de Ville, for which M. Forain has submitted a series of sketches of Parisian scenes, the principal one representing a group of men before a tavern at Montmartre, with the panorama of Paris before them. This decoration is to replace the two curious compositions by Chifflard, "Faust au Sabbat," and "Faust au Combat," which will be removed to the Petit Palais.

The decoration of the Hôtel de Ville is at last on the way to be completed. Mr. Joseph Blanc is putting the finishing touches to a cupola ceiling representing "Les Mois du Calendrier Republicain;" M. Olivier Merson is completing his important decoration on the grand staircase; and M. François Flameng is at work on the figure representing "Music," which had been originally commissioned from M. Ranvier. After the closing of the Salons, the two large pictures by M. Detaille, to be first exhibited at the Old Salon, will be fixed in position. This will complete the great work of decoration of the Hôtel de Ville, commenced thirteen years ago, and which, though it is certainly sadly wanting in unity of style and conception, nevertheless remains a remarkable monument of contemporary French art.

PICTURES AT THE NEW GALLERY.

No very great expectations had been formed in regard to this year's show of pictures at the New Gallery, but on the whole there is more of interest than we anticipated, and at all events there is one work of the first order of artistic power — Mr. Sargent's portrait group of "Children of A. Wertheimer, Esq." (251), at the top of the north room. This is a group of three young people, a boy and two girls, admirably composed, the two figures nearest the foreground being grouped with a "pouf" covered with light-coloured material, which has an important effect in the balance of the picture and in throwing back the background. A sumptuously-maned black poodle in the foreground, whose coat makes an effective contrast with the red sleeves of the girl next him, is also a very important element in the effect. We have seen more interesting pictures by Mr. Sargent, but none painted with more breadth and mastery than this, though unfortunately, as we not infrequently find in his works, the hands are rather neglected and carelessly painted.

Mr. G. F. Watts's large picture, "Love Steering the Boat of Humanity" (149), in the west room, shows the very opposite extreme in the uses of painting; Mr. Sargent representing the realism of everyday life (though not by any means sinking to mere realism in execution), and Mr. Watts the use of painting to convey abstract ideas. In this kind of moral aim in painting Mr. Watts has sometimes too much lost sight of pictorial and decorative effect; the present work, however, is a fine and effective picture independent of its moral; powerful and rich in colour, though a little confused in line and composition, and perhaps also in regard to *motif*. Apparently the sail in the boat of Life has come to grief, and the passenger is taking to his sculls, which, owing to a little carelessness in perspective, seem very short for their purpose. Mr. Watts has done finer things than this; but it is not a picture to pass over.

In the south room, where the numbers commence, a special feature has been made by the collocation of a dozen pictures painted in tempera; most or all of them being of that modern archaic school in which the spirit and treatment of early Italian art is revived. Though not feeling in a general way very much sympathy with this archaic school, such attempts have their interest in an artistic sense; several of them here are of much beauty and delicacy of design and execution; and tempera is a medium which lends itself very well to this kind of comparatively flat and shadowless treatment. The largest of these works is Mr. Walter Crane's "The Wind in the Tree" (7), in which the four winds are represented by floating figures in variously-coloured draperies, blowing through that early Renaissance form of wind instrument which we remember seeing in use also by the personages who enacted the Winds in that celebrated masque at the Guildhall some two or three years ago. The work forms a fine panel in a decorative sense, though its interest is rather superficial than intellectual. Mr. Batten's "Danaë" (3) is a very mediæval Danaë, harmless and tame in comparison with such a voluptuous figure as that of Titian for instance; but it is nevertheless a delicate and beautiful little work. A larger picture of the same class, Mr. Southall's "St. Dorothea and her Sisters refusing to Worship the Idol" (9) is also of considerable interest in its peculiar and conventional fashion.

On the opposite wall of the same room we are confronted by a large picture of Mr. Brangwyn's, "The Cider Press" (58), which takes us into an opposite world of art from these *primitifs;* a composition of crowded and energetic figures engaged in rustic labour, and painted with the greatest dash and freedom of execution (almost to the extent of coarseness), and in the strongest and most powerful colours. It is a remarkable picture; whether one altogether likes it or not may be a question, but at all events it is neither weak nor commonplace. A picture about which there can be no doubt at all is the portrait of Professor Liveing by Sir George Reid (57), an artist who is now at the height of his powers, and who takes rank as one of the most impressive of contemporary portrait painters. Mr. W. Wontner's picture of a young girl in an oriental costume seated by a fountain (81), with two lines of verse as a title, is a very good example of the style of picture in which superficial prettiness and high finish are the objects aimed at; of its class it is a very good specimen, a piece of very highly finished execution in a rather hard manner. Among the other noticeable pictures in this room (excluding landscapes) is Mr. Khnopff's curious performance, "The Secret" (35); the upper portion an interior where a woman is parleying with a mask stuck up on a pole, the lower portion a view of some mediæval buildings reflected in water; what is the meaning of the interior scene, and what its connexion with the lower view, is a riddle to which no solution is afforded. Mr. A. Foord Hughes's "Perdita and her Playmates" (47), landscape and figures, is a clever work in a rather curious and conventional style.

In the west room are not many things that will stay the visitor on his round. M. Benjamin-Constant's head of "Salomé" (196) is a somewhat theatrical study. There are two clever sketch portraits on a large scale, that of two children of Mr. R. Brough (161), and that of a young girl by Mr. J. J. Shannon (178). Mr. Wetherbee gives us one of his combinations of nude figures with landscape in "Halcyon Days" (144), a seashore scene with bathers, not equal in poetic suggestiveness to most of his works; and Mr. Herbert Draper has a very clever study of night effect in "Midsummer Night" (115), with Puck holding colloquy with some hares in the foreground. A picture quite out of the common way is Miss Fortescue-Brickdale's "The Pilgrim" (142), a charming family scene in the interior of a humble home; the title does not quite explain itself, but we presume it refers to the sad-looking man in the background, the wayfarer guest who contemplates social joys which are not his. At all events, it is a work of marked character and originality.

In the north room Mr. Austen Brown's "Haymakers" (222) is a life-size study of two rustics, man and woman, half hidden under a load of grass which one of them carries; a *genre* picture on a large scale and in a broad style of execution which gives distinction and interest to it; but was it worth doing on this scale? There are some dreadfully commonplace things, and on a large scale, too, in this room. Among the exceptions are Mr. Melton Fisher's dignified portrait of "Lady Orr-Ewing" (262) in a crimson dress and with the head powerfully and broadly painted; and Sir W. Richmond's refined and effective portrait of Mrs. Clinton Dawkins (289). Mr.

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Sargent's large picture of a young man "On his Holidays" (297) resting in the middle of a glacier, looks as if it were sent in as a joke, or to see how much the public will swallow; it is absolutely devoid of interest or pictorial character.

There are a few good landscapes; among them a beautiful little work by Mr. Adrian Stokes, "Wild Cherry Trees" (73) growing on the side of a hill which makes the horizon to the picture, with lumps of fleecy cloud floating in the sky beyond; a perfectly artistic work in landscape. Mr. R. W. Allan's larger work in the north room, "Far off Among the Hills" (276), a picture differing from anything we have seen from him before, is one of the best landscapes exhibited, remarkable for the force with which the foreground is painted, and the fine suggestive treatment of the distance. In "Desolation" (265), a marshy scene by the sea, with a setting sun, Mr. Ivystan Hetherington has produced a landscape marked by individual character and poetic feeling, and Mr. Alfred East's "A Morning Song" (230) is a large landscape sketch, rather than a finished picture, distinguished by fine colour and composition.

The Central Hall is occupied by Mr. G. H. Hodgson's collection of works of Japanese art, a portion of the exhibition which is on so different a footing from the pictures that we prefer to notice it separately on another occasion, especially as the catalogue is not yet available.

THE ARCHITECTURAL ASSOCIATION.

AN ordinary fortnightly meeting of the Architectural Association was held on Friday evening last week, in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, W. Mr. G. B. Carvill, Vice-President, occupied the chair in the absence of the President, Mr. W. H. Seth-Smith.

The minutes and some nominations having been read, Mr. H. A. Hall was elected a member, and it was announced that Mr. C. Harrison Townsend had rejoined the Association.

On the motion of Mr. H. P. G. Maule, hon. secretary, a vote of thanks was accorded to Mr. John Belcher, A.R.A., for allowing a party of members to visit the Eastern Telegraph Co.'s offices on the 12th ult.

New Premises Fund.

The Chairman announced the following additions to the New Premises Fund, *i.e.*:—Messrs. W. H. Lever, 25*l.*; John Murray, 10*l.* 10s.; W. Henry White, 10*l.* 10s.; C. de Gruchy, 5*l.* 5s.; H. E. Rider, 5*l.* 5s.; L. Jacob, 3*l.* 3s.; E. J. Stubbs, 2*l.* 2s.; F. R. Taylor, 2*l.* 2s.; A. C. Dickie, 1*l.* 1s.; T. T. G. Donaldson Selby, 1*l.* 1s.; V. A. Flower, 1*l.* 1s.; A. T. Griffith, 1*l.*; H. W. H. Palmer, 1*l.* 1s.; W. M. Paton, 1*l.* 1s.; H. C. Trimnell, 1*l.* 1s.; Horace White, 1*l.* 1s.; C. H. Strange, 1*l.* 1s.; and G. Vernon, 1*l.* 1s. The total of the fund now amounts to 4,116*l.* 14s. 6d.

Members' Supper.

The Chairman announced that the members' supper would take place on May 2 at the Great Central Hotel, Marylebone-road. It was hoped that there would be a better attendance at the supper than there had been at recent annual dinners. He might point out to members of the Association that the little entertainments of the Association were organised for the benefit of the whole body of members and not for the few, and it was not very encouraging to those who gave up their time organising the entertainments if they were badly supported. He did not see how members could disassociate themselves from the entertainments, which were part of the curriculum, and he hoped that the supper and the forthcoming *soirée* would be well supported.

Mr. R. S. Balfour, hon. secretary, announced the following donations to the library:—"The Jain Stûpa and Other Antiquities of Mathurâ," by V. A. Smith; Moghul Colour Decoration of Agra," by E. W. Smith, M.R.A.S.; presented by the India Office. A vote of thanks was passed to the donors.

Nomination of Officers.

The Chairman then read the names of those gentlemen nominated by the Committee as officers for session 1902-03. The list of names was printed in our issue for the 19th ult. The Chairman stated that the following additional nominations had been received, *i.e.*, Messrs. H. D. Wilkinson and John Murray.

The following gentlemen were then elected as scrutineers, *i.e.*, Messrs. H. G. Collins, E. W. M. Wonnacott, A. A. Carder, and G. H. Smith.

Arbitrations.

The Chairman then called on Mr. E. A. Grüning to read the following paper on "Arbitrations":—

Mr. President and Gentlemen,—

I have had the honour of being invited by your Committee to read a paper on Arbitrations. This I do willingly, but others have written books and read papers on this subject generally, and I therefore propose to speak simply on arbitrations from the architect's point of view, and to confine myself entirely to such as may occur in the ordinary practice of an architect. I propose also not to go too deeply into the question of precedents, or of law. In fact, as far as possible, to base my remarks on the knowledge I have personally gained in active practice.

Arbitration was really the earliest species of law. In primeval times the king or head of a tribe was the arbitrator, both in civil and criminal cases. True, he had extraordinary powers, which his successors at the present day do not possess, though sometimes I cannot help thinking it would be a mercy if they did, and were able, in the same way and by the same means, to shorten cases which are otherwise very protracted. In course of time, law superseded arbitration, but a reaction set in, by which arbitration has become more than formerly a recognised means of settling disputes, being now invested with legal powers, which until recently did not exist.

Although many arbitrations had taken place under agreements, the beginning of this change arose with the legislation of the Law Procedure Act of 1854. But the Arbitration Act of 1889 did more than anything to put arbitrations on a proper basis, and to invest them with a dignity and importance which till then they had not possessed. Without going into the detailed provisions of this Act, it may be said that the arbitrator has all the powers of a judge of the High Court, except the power of committal to prison for contempt of court. His proceedings are as strictly defined as those of the courts, and he cannot be deposed except for misconduct or corruption. I have said that I purpose to avoid going into the details of legal decisions and appeals, but I may mention some who have written and spoken on the subject, and on such points as this I should refer you to a most able paper, written by Mr. Strahan, and read at the Royal Institute of British Architects in January, 1895; to an able article in the *Builder* of August 17, 1901; and to the following more elaborate text-books:—"The Law Relating to Civil Engineers, Architects, and Contractors," by Macassey and Strahan; also Russell on "Arbitrations and Awards."

The object of arbitration is, or should be, to simplify the decision of disputes. The arbitrator should be an expert in the matter which he has to decide, the object being to avoid waste of time in informing him of the customs of professions and trades, and bringing evidence necessary to prove such matters, which he should, of his own knowledge, be able to decide upon without any such evidence. Arbitrations, too, should not, if before a lay arbitrator, be allowed to involve questions of law. These, if they do arise, are better dealt with direct by the proper courts, though I shall afterwards show how an arbitrator can deal with them in case of need.

There are three classes of arbitration—first, with two arbitrators and an umpire, the decision of the umpire alone being final; secondly, where the decision of the umpire in conjunction with one of the arbitrators is necessary; thirdly, where there is a sole arbitrator. With regard to the first, excepting the cases to which we shall refer hereafter, it is desirable to avoid having two arbitrators and an umpire, unless the arbitrators conduct the case on behalf of their respective clients. This is not so if counsel or solicitors are employed, and in such a case the two arbitrators merely sitting with the umpire, are practically more ornamental than useful. Under the second head, there is only one class of arbitration, namely, that of party walls, under the Metropolitan Building Act of 1894. Here it is necessary that two of the three surveyors should sign the award. Under the third head, where there is a sole arbitrator, this is, in many respects, the best method of arriving at a rapid decision on the points in dispute.

The matters which come to the arbitration of an architect or surveyor—and I use the word surveyor in the sense in which Sir Christopher Wren was surveyor to the fabric of St. Paul's, a title which has been held by his distinguished successors to the present day—can be classed as follows:—

Party walls under the London Building Act of 1894.

Dangerous structures.

Questions arising out of the various factory Acts and amendments thereto.

Questions relating to light and air.

Building contracts.

Dilapidations.

Professional questions between architect and client; and

Compensation cases. Under this head would be included insurance claims.

With regard to the party-wall question, under the London Building Act, 1894, this is really the most frequent of disputes arising in our practice. The method of dealing with it is very carefully set out in Section 8, and I need hardly here waste time in describing the nature of the procedure. It amounts to this, that an arbitrator, or surveyor, is appointed by the building owner, and another by the adjoining owner, and if these two gentlemen cannot agree on the merits of the case, they must agree to refer the matter to the umpire, technically known as the third surveyor. On his undertaking the reference, the procedure usually begins with a visit to and careful inspection of the structure in question, which, under the existing Act, may also include party fence walls, the Act of 1855 not referring to these. A consultation then generally follows as to the nature of the award, witnesses being seldom or never called. The third surveyor then drafts the award, sending a copy of the draft to each of the others, and having, if necessary, a further meeting in which the terms of this award are finally discussed. It is necessary that the award should be signed by two out of the three surveyors; but, as a matter of fact, the decision really is that of the third surveyor alone, as the building owner's surveyor, in order to proceed with his work, is practically bound to adopt his decision. And here I ought to mention one difference between this species of award and any other. As a rule, the arbitrator or umpire is both judge and jury, and questions of fact determined by him cannot be re-argued or opened up again, but under the clauses allowing for appeal to the County Court, and from that to the superior courts, against an award, it is possible to open up the whole case from the beginning, even to a recapitulation of the evidence (if any) and arguments originally placed before the third surveyor, and even to offer fresh evidence. Here we find that the above-quoted Act has materially increased the difficulties of the surveyors in dealing with party or party-fence structures. All former building Acts made no mention of compensation to the adjoining owner for disturbance—in none of the former Acts was this mentioned—and the building-owner had the right of rebuilding if he could prove that this was necessary or advisable, even for his own purposes only, without regarding the convenience of his neighbour. The effect of this alteration in the law has been a bad one. The adjoining owner either wishes to keep his premises to himself for his own purposes, and without disturbance, in which case he fights strenuously to maintain the structure, which for reasons of public policy ought to be renewed, or he makes it a means of extortion, demanding an unreasonable and often imaginary amount of compensation. This very often increases the difficulties of the third surveyor, as he is naturally led to countenance the retention of party structures which would be better pulled down and rebuilt. In this case, as in others, I will give the form and nature of award later on.

With regard to the dangerous structures, this is a new form of arbitration, arising under the Act of 1894. Formerly all such cases were under the jurisdiction of and were tried at the police-court of the district. It is now open to any one conceiving himself aggrieved by the receipt of a dangerous structure notice to give notice under Part 9 of the Act, provided he does so within seven days, requiring the matter to be referred to arbitration, and Clause 107 of the Act prescribes the method in which this shall be done. It is practically a repetition of the procedure in party walls, with the exception that the award is signed by the arbitrator or umpire only. In this case, if the owner of

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the alleged dangerous structure does not demand within seven days after service of the notice the appointment of an arbitrator, the matter reverts to the police-courts, as under the former Acts.

We now come to arbitrations on questions of light and air, by far the most difficult of any with which an architect or surveyor can be called on to deal. The state of the law on this subject could not be more unsatisfactory than it is, owing to the conflicting decisions of various Judges and the reversal of the judgments of the Court of first instance by the Courts of Appeal—notably in recent cases. Efforts are being made to obtain a revision of the law as to easements of this class by a joint Special Committee appointed by the Royal Institute of British Architects and the Surveyors' Institution, with the assistance of two eminent King's Counsel. A Bill will be introduced into Parliament, we hope, in the current session, and I think every one will wish it success in simplifying matters of such great complication and difficulty. The main principles of the proposed Bill are settlement by arbitration, the proceedings being similar to those under the Factory Act; the elimination of extravagant claims for special uses of ancient lights; the extinction of claims of this class in future buildings not already possessing ancient lights; and the simplification of means of objecting to such rights being acquired by the simple means of giving a statutory notice of objection instead of the present cumbrous and barbarous means of erecting and maintaining screens or other physical obstructions. Arbitrations under this head arise under different circumstances. The arbitrator or umpire may be appointed by agreement; he may be appointed by the Judge of the Court in which the case is tried, or he may be required simply to report to the Judge his independent opinion of the case. In this sense he is practically an arbitrator, inasmuch as the Judge would probably, and in nearly every case, give his judgment in accordance with such report, if confined strictly to questions of fact. The duties of the arbitrator here are very wide, and he can, and should, often do much to bring the parties together by suggesting a reasonable compromise, either by the modification of the defendant's proposed building, by reasonable compensation for the injury likely to be inflicted, or often successfully by suggesting an improvement to the plaintiff's building—of course, in the latter case to be carried out at the expense of the defendant.

The next class we have to deal with are dilapidations. These are more strictly matters of account. The repairing clauses in leases and agreements are often vague, and it is, therefore, often difficult to arrive at a decision. The arbitrator must determine on the items of claim which he intends to allow, and after that price them according to the best of his knowledge.

A more delicate question than that arising between architects and their clients cannot be conceived. Often these cases are painful to hear, and to decide; they usually take the shape of an alleged overcharge on the part of the architect, resisted by a counterclaim for his negligence, and damages arising therefrom. The procedure is the same as in other arbitrations, but in this—more than in any other class of cases—there is apt to be personal feeling and recrimination. In my own experience most such cases arise where the so-called architect is not a member of the Royal Institute of British Architects, but nevertheless attempts to use, and often to unduly interpret and strain to the utmost, the schedule of professional charges.

With compensation cases the architect has comparatively little to do. These claims generally arise with reference to properties taken under the authority of an Act of Parliament. They may arise as a consequence of damage caused by the construction of neighbouring buildings or works, both as regards structural damage and consequential injury; and there may be other causes of complaint. But, as a rule—and particularly as to compensation for compulsory purchase—these are left in the hands of surveyors or agents, pure and simple. I mean agents dealing with properties, and accustomed to assess the value of land, and the rental values of land and buildings. I am sorry to say that, with the occasional exception of the plaintiff's case in actions for injury to light and air, there is no class of arbitration or trial in which such exaggeration takes place as in compensation cases. This would seem to arise under the idea that a jury or an arbitrator would average the claims made against the counter offers. It appears often in these cases quite impossible to give conscientious evidence, as that would be of no use to the party represented. In fact, the witnesses too often consider that they are advocates rather than experts. A well-known judge once remarked that there were three classes of witnesses—the truthful, the perjurer, and the professional expert.

With regard to the duties of arbitrators and umpire. Should arbitrators be employed, their duty is to prepare each his own case: to boil it down and simplify it, so as to only produce the salient points of real importance at the hearing. I have already said that arbitration is intended to simplify the settlement of disputes, and I cannot too strongly advise anybody engaged in this class of practice to be most particular and most careful in preparing the case for his side, fully setting forth his case without bias or exaggeration. More than this: he should, if he can, endeavour to ascertain and to work out the opponent's case, so as to be ready to meet his opponent's arguments. He should have every drawing, every paper that he has to produce during the case, readily accessible and at hand, in order to avoid waste of time. In party wall cases, before the third surveyor is called in, accurate drawings should be made of the wall, both in plan, elevation, and section. The wall should be plumbed to ascertain how far, if at all, it is out of the upright; and the nature of the materials of which it is composed should be, as far as possible, ascertained. The surveyor to the building owner should also be prepared to state exactly what he really proposes to do, which cannot always be disclosed by the statutory party-wall notice, as this has to be given in advance, and it is not always possible at first to ascertain the exact circumstances of the case and condition of the structure in question.

Now, in speaking of the duties of arbitrators as such, where there is an umpire, I may as well say that under this head I include the duties of architects or surveyors who have to prepare their side of the case for hearing. In all of these cases the same care should be taken in preparation—no points should be overlooked, and the points likely to be raised by the opposite side should be foreseen. The two architects, whether acting as arbitrators or not, should before the hearing agree facts as far as they possibly can; they should verify each other's drawings. In cases of light and air they should prepare a model, to be jointly agreed upon by both parties, and they should do everything to avoid disputes as to fact at the hearing, so that time will not be wasted in producing a lot of evidence to prove anything which ought not to require proof at all.

With regard to the Factory Acts, arbitrations are a procedure of comparatively modern form. They arise out of the operation of the original Factory Act and of numerous amendments of such Act, and are confined to determining the necessary provision for means of escape in case of fire, and to certain sanitary arrangements, both of which appear formerly to have been much neglected. Many difficult cases arise, owing to practical considerations, and the necessity of obtaining rights of way or access to the premises of neighbouring owners. I must say that the London County Council, as the statutory authority, though gradually improving in this respect, sometimes render these matters very difficult to decide by incorporating in their notices requirements, conditions, and provisions with which it is absolutely impossible for the owners of property to comply. But that procedure of some sort was imminently necessary is quite clear. These questions bear very hardly on owners of property, who might in many respects be more leniently dealt with than they are at present. In this case, the presence of umpire and two arbitrators is necessary at the hearing. The parties may or may not be represented by solicitors or counsel. The decision, however, rests solely with the umpire. As in all other cases, there is an appeal to the Courts; but this appeal can only be on points of law and the validity of award, but not upon the facts as originally decided.

Troublesome matters are arbitrations arising out of builders' contracts. Here, again, much can be done to shorten a reference by agreeing beforehand to such items as possible, and also by agreeing in what order the claim and counterclaim, if any, should be taken, so that in case of need an interim decision may be given, shortening disputes only too likely to be prolonged. It is no unusual thing for the hearing of an arbitration on a building contract to last for any time from twenty to forty days, when anything that either party might have gained is completely swept away by costs. In these protracted cases nearly always personal feeling is introduced, which does not tend to promote a rapid settlement. Under the form of contract now in general use, the arbitration can only be opened after completion of the works, or when either party is dissatisfied with the architect's final certificate. But there are many cases in which much friction can be avoided and time saved by a hearing during progress of the works. The architect of a building must always remember that he is not only the agent of his client or employer. He must also during progress of the works as above mentioned hold the scales of justice between employer and contractor. Questions as to material and workmanship may arise which it is difficult to determine later on, when much of the constructive work has been covered up.

As to dilapidation arbitrations, I think I have already said nearly as much as I need. These rarely get into the Courts; they are generally settled by the surveyors on behalf of claimant and landlord, and tenant or defendant, an agreement being come to before negotiation as to the name of the third person, or umpire, whose decision shall be final. They are matters of little interest, rarely involving any special principle of law, but really only being a money dispute.

With regard to disputes between architects and clients, I think I need add no more to what I have already said. In compensation cases, the procedure is practically the same as in other arbitrations already noticed.

I have, therefore, so far, I think, defined the various methods of procedure, the duties of the umpire and arbitrators, including under the latter head the architects or surveyors employed to advise their respective clients.

We now come to the preparation of awards. The first duty of the arbitrator or umpire is to ascertain that he is properly and legally appointed, to receive and take into his possession the documents or agreements referring to such appointment, to ascertain generally the nature of the claim and counterclaim, if any, so as to avoid what I may call fishing claims, and to regulate the order in which the case shall be heard. The arbitrator or umpire may be appointed in various ways; he may be appointed by a judge of one of the High Courts; he may be appointed by agreement, or by some person to whom his nomination has been referred, such as the President of the Royal Institute of British Architects, or of the Surveyor's Institution; he may be the person specially nominated in a building contract as the arbitrator. The preliminary points being settled, he must proceed with the hearing, first arranging as to whether witnesses are to be sworn, and must show great patience in allowing all matters to be brought forward, and, at the same time, firmness in stopping irrelevant matter and personal recrimination. He sometimes may, in questions of light and air particularly, be able to make a suggestion which practically puts an end to the case, and it is his duty, whenever he can do so, to shorten the proceedings by means of proposing a fair compromise. He should avoid interfering in the conduct of the case, leaving each party to conduct his own case, and only speaking when it is necessary to give a decision on a point of procedure or to settle or define a doubtful answer. He should particularly avoid showing any leaning to either side, and should allow no expression of his opinion as to the merits of the case to escape him. In rare cases it may be necessary for him to give an interim decision, or to state a case for the opinion of a superior Court prior to proceeding further; for instance, he may have to decide in a disputed account whether or no there is a contract; but this should not be done unless absolutely necessary. At the conclusion of the hearing, having given both sides a fair and impartial opportunity of bringing forward evidence and statements, he should reserve his decision in order to read through the evidence and his own notes. These he should make himself, shortly, both of the arguments on either side as well as of the heads of the evidence. If shorthand notes are taken throughout the whole of the proceedings, his own short notes,

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embodying only the salient points, are much easier of reference than a verbatim report. It is always well to agree, with regard to shorthand notes, by whom they shall be paid for in the first instance, and that they shall be accepted as correct by both parties. It is perfectly useless to have two shorthand writers, one on either side. Generally speaking, it is convenient to have shorthand notes taken of the whole case, without necessarily having them transcribed in their entirety. It saves a great deal of time to have the speeches of counsel and arguments transcribed, as it is impossible for the arbitrator or umpire to follow these exactly with his notes without causing great delay. The heads of evidence he must himself be able to take down. In purely technical cases, such as dangerous structures, party or party fence walls, arbitrators or umpires should be capable of drawing their own awards. In fact, the Act would seem to preclude the employment of solicitors or counsel in these cases. The award should always begin with a recapitulation of the origin of the dispute; under what circumstances it has arisen, whether under contract or otherwise. This part, generally called the preamble, should be accurate and should enumerate the whole matter concisely. The award itself should be drawn carefully in as few words as possible, setting forth the items in dispute in separate paragraphs, one paragraph to each item rather than a connected sentence, stringing them all together, and it is sometimes necessary to attach and refer to diagrams or plans, &c. In it the arbitrator must recollect that he is both judge and jury, and, in fact, he has more power than a jury. A jury's decision can be upset on the ground of misdirection by the judge who sums up. An arbitrator has no one to sum up to him, and his decision on the facts is absolutely final, except as I have mentioned in party-wall cases. In most cases, except those above named, it is advisable to employ a solicitor to draw the award, furnishing him, of course, with all documents necessary to draw the preamble, but not with more than the heads of the decision at which you have arrived. If a legal point is strongly contested during the hearing, it is better to state at once that if such point is insisted upon you will make your award subject to a special case to be stated to one of the superior Courts. An arbitrator must also remember that he is not altogether in the position of a judge. He has to decide on facts, and not on law, and for that reason it is unadvisable and unusual that he should in any way give any hint of the reasons which have induced him to come to his decision. I have heard it said that this is cowardly, and that a man should be prepared to give his reasons for anything that he does, but I cannot see that this accusation is correct. The arbitrator has to do his duty according to his conscience, and the very essence of his employment is to put a final end to the dispute. His simple decision on a point of fact is an end of this, whereas if he gave reasons he might leave the matter open to continued and prolonged further litigation. Where a case is stated for the opinion of the superior Court it is necessary to give alternative decisions—that is, if the Court rule one way, then the decision will be so and so, the alternative decision being given in case the Court rules the other way.

As to costs of arbitrations, these generally follow the decision, but in many cases both parties may be equally in the wrong, and it may be necessary to give some decision as to how costs are to be allotted. Both parties cannot be equally in the right.

One last word on awards. In making an award do not hesitate, or attempt a compromise. As far as possible give your award one way or the other. Nothing is so unsatisfactory to both parties as striking a balance, or "splitting the difference."

Care must also be taken to issue the award within the periods prescribed by the Arbitration Act. But the umpire or arbitrator has power to enlarge the time for this, provided he does so in writing prior to the expiry of the prescribed period.

Now, having spoken of arbitrations, I should like, with your permission, to speak on the question of their avoidance. In building contracts, for instance, the necessity for arbitration often arises out of carelessness, either in the preparation of drawings, specifications, and sometimes of quantities, or out of the want of proper notes made during the carrying out of the works. It is only fair to a builder or contractor that at the outset of the job he should know fairly well what he has to do. To him it will make a great difference in organising his work and in ordering his materials; in fact, it may make the difference to him between profit and loss. Builders are human beings, and if they see a loss before them you are not likely to get as good work out of them as if they see a profit, and any contractor will tell you that he can work cheaper for one architect than he can for another. In the first place, contract drawings should not be looked upon as pretty pictures, solely from an artistic point of view. Every line should be definite, and should mean something; every colour should be an indication of material; shading should be avoided; the drawings should not be mixed, details being superimposed upon small scale drawings. Everything should be set out as far as possible with the view of giving the workmen actually employed what amounts to a book that they can read. Drawings and draft specifications should be completed before being placed in the hands of the quantity surveyor. Generally the quantities form no part of the contract, but it is only fair that the notes made by the quantity surveyor during the progress of his work should be carefully considered and added to the drawings and to the specification. The quantity surveyor should also have ready access to the architect during the process of taking out quantities, in order that any point not clear on drawings, &c., can be made so before the work is tendered for. An architect should, as far as possible, avoid all alteration of his design during the progress of the works, and ought to have made up his mind beforehand what he wants to have. Alterations are a fruitful source of dispute, though they often cannot be avoided on account of the idiosyncrasies of clients. The next great cause of dispute arises out of the question of giving orders for extras, omissions, and variations. It is almost impossible on works to give a written order for every variation and instruction required, but the clerk of the works or foreman can be instructed to make notes of these as they occur from day to day to submit them to the architect on his next visit, and if the architect initials them they can be then acknowledged to be orders in writing under the terms of the contract. The proper provision of full-sized and detail drawings and other details at the earliest stage of the works is of great use to the contractor, and the showing of consideration to him in facilitating the setting out of the work and the ordering of goods is an inducement to him to do his work conscientiously.

Of course, builders are also often in fault, raising contentions and unwarrantable claims. The only remedy for this is steadily to refuse to entrust them with further work.

With one more remark I shall conclude. A constant source of trouble in contracts is the attempt to please our client by trying to get a larger amount of work or more elaborate work done for him than an architect can properly expect for the amount placed at his disposal.

The Chairman, in opening the discussion, said, in Mr. Gruning they had an able exponent of the various intricacies of arbitrations, and he wished the paper had been a little more technical.

Mr. A. O. Collard, in proposing a hearty vote of thanks to the lecturer, said they were all much obliged to Mr. Gruning for his paper, though it might with advantage have included a few personal references to the practice Mr. Gruning had built up, so that the members might apply that experience to their own smaller affairs. It was said about artists that they were born, not made; and he would apply that to arbitrators. Certainly, he did not think Mr. Gruning would have been able to build up his large practice if he had not been a born arbitrator. They might have expected Mr. Gruning to have referred to the question of fees, and they might be glad to know if this sort of business was adequately remunerative or not. Mr. Gruning said that the object of arbitrations was to simplify the decision of disputes. It had always struck him (the speaker) that this object was attained in the case of building disputes when the architect acted as arbitrator, but when a man who had no technical knowledge of the subject was called in to adjudicate the matter was generally settled only after long delay. All those who had acted as arbitrators would agree that legal points must be avoided, for they complicated the issue and added to the confusion. In these matters it was common sense which helped to settle cases quickly. As to light and air cases, he was not acquainted with the Bill which was to be brought forward this session, and he would like to know what the result would be of the statutory notice which Mr. Gruning said would be such an improvement on the cumbrous and barbarous method of hoardings or screens. It seemed to him that if they were to send out these statutory notices when something was being done that might affect a client's interests there would be so many of such notices that the remedy would be almost as bad as the disease. What he would like to see brought about was the state of affairs in regard to light that existed in some other countries, *i.e.*, a total absence of law as to ancient lights, though, of course, in building, a man had to have proper regard for his neighbour's land and buildings, and if we were all under such a rule and ignored it, and put up a building the lights of which might be obstructed by the neighbour's building, we ought to suffer the injury which would follow. These laws and customs of ancient lights seemed to be records of barbarous times, and the sooner they were swept away the better. He did not anticipate much good from the Bill. As to Mr. Gruning's suggestion as to models, that seemed a sort of millenial arrangement; it would be convenient, perhaps, and might be done, but while people fought about an issue, it did not seem to be practical. As to disputes between clients and architects, he did not know whether such disputes occurred often or not. He had never had such a dispute, and he could not believe that many architects were wholly or mostly to blame in such disputes. Among the variety of clients one had in a lifetime there were many curious and cantankerous people, and probably some irritation and difficulty was due to architects not having the ability to make themselves understood, for there were people like that who could not explain their drawings or ideas. The more architects went about, and the more tact they acquired, the more likely they were to avoid these troubles. As to taking up awards there was the mysterious and old-fashioned method of the man who was appointed third surveyor preparing the award which the litigious gentlemen who had entered into the dispute could take up by paying the fees. He did not know whether that method applied in all cases, and he would like to know if there was a better method. It seemed odd that the fee should be paid in advance—possibly by the wrong person—and in the law courts a decision could be got and the bill would not come in until afterwards. If it was of advantage to become well acquainted with matters of arbitration—and it probably was—why should they not make a study of the matter as young barristers studied law work? Young barristers walked into the courts and took a keen interest in what was going on, and partly learnt their profession in that way. If any one wished to take up arbitration work it would be a good thing to attend arbitration cases and see how they were conducted. He had not been to the Association meetings for some time, and he desired to take that opportunity of congratulating them on the attendance on that occasion, and on the growing interest of the younger members in some branches of the profession. Twenty-four years ago they would not have got such an attendance on a similar occasion.

Mr. H. T. Hare seconded the vote of thanks to Mr. Gruning for his valuable paper. The paper was on a text-book subject, about which papers were not often read, and therefore Mr. Gruning's lecture was particularly valuable, especially as it contained a great many hints as to methods and procedure. One of the main reasons why arbitrations were so generally the means of settling disputes in building matters was that in building contracts and questions relating to building it seemed almost impossible to get the legal mind to grasp and understand the points. He had been in the courts once or twice when building cases were being heard, and he found it amusing to see the muddle into which the lawyers got directly they began to argue on the subject. This being the case, it seemed to be a necessity for questions of this kind to be settled by professional men conversant with the technicalities. As to the question of ancient lights, Mr. Gruning mentioned that the special committee of the Institute of Architects

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and of the Surveyors' Institution was dealing with the question with a view to amending the law. This seemed to be very desirable, for there were many ways in which the law might be simplified. He did not know if it was proposed to do so, but he thought it might be done with advantage—*i.e.*, to make the angle of 45 deg. a recognised standard. It was not recognised at present, and although one naturally referred to it in most cases, it had no legal status; but in most cases, where the light had an angle of 45 deg., it was reasonable to think that that light was not seriously impaired. If that standard were legally recognised, it would simplify a great many cases. Looking at the question of ancient lights in a general way, he was disposed to agree with the last speaker. The only way to settle the question of ancient lights was not to have them at all. He could not see how a man had any right to light which came over some one else's property: he had right to light over his own land, but to nothing more, and if he wanted to put in a window on one side of his house overlooking the land of the adjoining owner, he must set back the building sufficiently to give him the light he wanted, and he ought not to be entitled to anything more. Anything more than that was stealing from his neighbour. As to party-wall notices, Mr. Gruning said that the building owner should be prepared to say in his party-wall notice what he proposed to do. That was almost an impossibility, because in such work you could not tell what you were going to do until you really got to work, and the usual party-wall notice, for that reason, stated every possible thing you could do with the wall. With regard to building contracts, Mr. Gruning referred to them in a casual way. If quantities usually formed part of the contract the number of arbitrations would be reduced by one-half. The only just contract was the contract of which the quantities formed part. The builder could not be expected to check the quantities, and if he did not do so, there was no possible means of knowing whether they were correct or not. If the quantities formed part of the contract, the architect, who was sure to make variations as the work was proceeded with, could make what alterations and improvements he liked, knowing that the settlement would be on a fair and equitable basis. No architect, if quantities were part of the contract, would vary the building out of reason, and to the detriment of the client. He might add that he always made the quantities part of the contract where he could.

Mr. C. H. Brodie, in supporting the vote of thanks, said the good arbitrator needed qualities which we did not all possess. As to the taking up of awards, that was a serious matter, because a man might be appointed an arbitrator and make his award, and yet the award might not be taken up. The arbitrator may have devoted ten, twenty, or even the forty days Mr. Gruning spoke about, and yet he would not get a penny if the award was not taken up, and he would like to know how Mr. Gruning got over that difficulty. There was another eventuality which sometimes occurred, and that was the death of one of the parties. He knew of such a case, and no one connected with the arbitration had been paid, and he did not believe they would be. If one of the parties died, and the other did not care a straw about the matter, there was, apparently, an end of the whole thing, and no one got any fees. Another point that was not referred to in the paper was as to the Tribunal of Appeal under the London Building Act. That tribunal was an instance, and a very fine instance, of the action of arbitration. The three gentlemen who constituted the tribunal were practically arbitrators, and they knew thoroughly the subjects relating to which cases were brought before them, and the decision, which was given in a very short time, was likely to be exceedingly just. As to the question of light and air, it fell to his lot, as secretary of the Practice Committee of the Institute, to move in that room the appointment of the Joint Committee of the Institute and the Surveyors' Institution. The Committee was appointed, and they met and had the assistance of two eminent King's Counsel. Now that assistance was only too apparent in the suggestions for the draft Bill which it was proposed to bring before Parliament. His views on the subject were entirely in accordance with the views of the two previous speakers. He said emphatically—and he spoke from experience in France and America, where no such thing as ancient lights was known—that no alteration of the law would be satisfactory which did not prevent, after a certain day, the acquirement of rights of light over any land but your own. The state of the law as it now existed was a scandal, and the assistance of those two eminent King's Counsel had been to the detriment of what the Committee had been aiming at. Those two gentlemen might feel that it was perfectly useless to go to Parliament asking for the abolition of the law of ancient lights, and if it was useless to do so then they had better ask for the little that was being asked for rather than nothing at all; but he felt most strongly that the only proper amendment of the law of ancient light was its abolition, though, of course, existing rights must be respected. He agreed with Mr. Hare in his remarks as to the angle of 45 deg., but they must bear in mind that the angle must be a lateral angle as well as a vertical one, because lights were as often injured by being built close up at the sides as by being built above, directly in front. Mr. Collard was slightly in error as to statutory notices. A statutory notice was only to be given in a case where a man was attempting to "steal something from his neighbour," as Mr. Hare rightly put it. Instead of putting up a huge screen you could serve your neighbour with a notice that the window he had put in overlooking your land should never become an ancient light. As to dilapidations, the Practice Committee of the Institute for the last two years had been engaged in producing a book on the subject. The book was practically complete, and he could not do better than advise members to get a copy of it when it was published, for he thought they would find the subject treated in a very complete and able manner. As to the Factory Acts, the Practice Committee took a very active part last year in sending in a very strong memorial to the Government, who then had a Bill before the House for further amending the Acts. The Committee did this in agreement with the London Chamber of Commerce, and they pointed out to the Minister who had charge of the Bill that a further amendment was not necessary, but that what was necessary was a codification of existing Acts, involving, of course, a certain amount of amendment in the process. The result of those representations was that the Bill was withdrawn, and in this session of Parliament a Bill codifying the existing Acts had been, or will be, introduced. He mentioned these matters partly because of what one heard occasionally. He had seen only that day, in a paper which ought to have known better than to have published it, an unsigned letter, in which the writer took upon himself to say that the Institute was absolutely useless, and that he and others would leave it. A man who could write such a letter had better leave the Institute, for he was not in his place in belonging to it, especially as he did not put his name to the letter, and so show that he was not ashamed to write on the subject. As to the cost of arbitrations, it was perfectly well known to men who were engaged in this class of work that lawyers would not, if they could avoid it, let a case go to arbitration by a surveyor, and the reason for that was that these frequently would not throw the costs on the losing side. Lawyers argued that in going to the courts they stood to win or lose, and if they won they got their costs. In arbitrations the costs were frequently greater than the amount in dispute, and in many cases it was an injustice when an arbitrator gave an award which said that one side was wholly in the right, but which made both sides liable for the costs. By giving such awards the profession lost a great amount of work, and he agreed with Mr. Gruning that the costs should follow the event in the ordinary way. He agreed with Mr. Hare as to quantities forming part of the contract, and again, he might mention the Practice Committee of the Institute. They had drawn up a form of contract in which quantities would form part of the contract, and that amended form was to come before the general body of the Institute at the next meeting. As to the apparent inability of the ordinary legal mind to understand building disputes, that was a very interesting matter. There was a recent case in the courts which affected a firm of builders who had carried out a large contract. There was no dispute that extra work had been carried out, and equally that the work was not included in the quantities on which the builders had tendered, and it was agreed that the case should go before an arbitrator. This was done, and the arbitrator, who took a common-sense view of the matter, made his award subject to a legal point being settled by the courts. The point of law reserved was whether or not the builders were responsible for the correctness of the quantities, and it went before some highly-trained legal minds, and they decided that the builders were responsible for the quantities, and that it was the business of the builders to check the quantities, and in arguing on that one learned counsel made some astounding statements on the practice of building and as to what quantities were. They were absolutely ridiculous, and the decision of the court was just as absurd. It was a matter of absolute impossibility at the present time for the builder to check quantities. Bills of quantities, which took six or eight weeks to prepare, and which were often an extensive series of documents, could not be checked by builders in the course of four or six days allowed for sending in a tender.

Mr. H. A. Satchell considered the paper especially valuable as being based upon personal experience. He would like to ask Mr. Gruning as to party wall awards: Were they necessary? or could the building-owner avoid them and thereby escape paying the fees of the surveyor to the adjoining owner? He had peculiar pleasure in supporting the vote of thanks apart from his enjoyment in listening to the paper. On one occasion he had had a delicate light and air matter which, not knowing how to deal with, he went to Mr. Gruning, who gave him ungrudgingly the best of advice and, by suggesting a way out of the difficulty, probably saved him and his client the anxiety of an action.

Mr. Henry Lovegrove said that the best way to settle building disputes was by arbitration, and he thought the architect—or surveyor—arbitrator should be chosen. Years ago, before he devoted so much attention to the Building Act, he often acted as arbitrator. He found that where barristers were appointed to act as abitrators there was a great waste of time in discussing extraneous matters—points of law, for instance, instead of facts. When an architect or surveyor sat as arbitrator the discussion was kept to points of fact, and though cases might last a long time and were costly, the surveyor-arbitrator kept the discussion to the point. As to party walls under the London Building Act, he sometimes thought the adjoining owner's surveyor went into the matter with one idea in his mind, *i.e.*, fees, and he (the speaker) thought fees were often absurdly large compared with the work done. As to dangerous structures, he supposed he had had to deal with more dangerous structures than any other London district surveyor, and he had never had one referred to arbitration. The matter usually went before the magistrate in the ordinary way. As to questions arising out of the Factory Acts, he thought that some codification was required of the various laws relating to those Acts. He knew of a case of a warehouse of four floors, each let out to different people, and, the County Council requiring something to be done—fire escape staircases, or something of the kind—the owner served each tenant with a proportion of the cost of the work, and also a proportion of the 5 per cent. commission of the architect engaged. He (the speaker) was asked by one of the tenants as to the legality of this, but all he felt able to do in the circumstances was to advise the tenant to consult a lawyer. As to light and air, the matter came before the Science Committee of the Institute when he was Secretary of that Committee, and after various reports had been prepared he told the Committee that it was impossible to do much in the matter while there were so many lawyers in the House of Commons, for questions of light and air made so much work for the legal profession that they would not favour a change of law. Long before the foundations of a building were finished, ancient-light boards were often to be seen on adjoining property. As to disputes on building contracts, they should be referred to practical men—surveyors or architects. He had been in the courts during the hearing of building cases, and the ignorance of judges and lawyers on building matters was lamentable; they often did not know the terms, even, in matters on which they were asked to give a proper decision. As to dilapidations, it seemed to him, in reading the decision of judges, that they now take a more

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common-sense view of the question of dilapidations than they used to do; they did not now require a man practically to rebuild premises after occupation. Some gentlemen seemed to think that much good would result if quantities were made part of the contract. He agreed with that; but on the other hand it might be said, and was said, that to make quantities part of the contract would encourage slipshod quantities generally, and would make people trust to chance and the absence of responsibility. When quantities were not part of the contract, surveyors were careful to do the work thoroughly. In Scotland, they had a tentative bill of quantities, and work was measured up at the end.

Mr. H. J. Leaning said that by arbitration he thought they got the fairest results so far as building disputes were concerned, but he was looking forward to the day when there would be a court to which building and similar disputes could be referred. They were apt to suppose that the subject of building was more intricate than anything else, and that no one could understand it but technical minds; but every branch of engineering was quite as difficult to follow as building, and the only possible solution of such problems was by arbitration. The drawback to arbitration was that there were no precedents, whereas if the matter went to a court of law, one got a registered decision which became a precedent. By arbitration questions were settled over and over again, and nothing could be quoted. He did not know why the Chamber of Arbitration, which was established by Sir A. Rollit, had turned out such a lamentable failure. The scale of fees was fixed and was unalterable; there was a staff of arbitrators of every conceivable kind to select from; and yet, in spite of that, a very small proportion of cases came before the Chamber. He could only suppose that the legal profession set their face against it. As to arbitrations, he had found out from experience that one was inclined, when one had a good case, to go a little too fast for the arbitrator. It was a good plan when there was no shorthand writer present to sit near him and see that he took down your points.

The Chairman, in putting the vote of thanks to the meeting, said that from the paper and the discussion it was clear that they must put themselves in the hands of the born arbitrator in cases of dispute; but the arbitrator's position was in danger, for if the angle of 45 deg. in light and air cases was recognised by law, and if easements such as rights of light over neighbouring properties were abrogated, the arbitrator would not have much more than party walls to deal with.

The vote of thanks having been heartily agreed to,

Mr. Gruning, in reply, said he must disclaim being a born arbitrator. It was a matter of pure chance that arbitrations had come in his way. He often acted as arbitrator in the past, but of late years, owing to the decease of older men than himself, there had been a sort of concentration on his head of the desire of people that he should decide the disputes that occurred. Possibly his reputation had grown from the fact that in the early part of his career he had had to fight a good many party-wall and light and air cases, and he got the reputation of being a good fighter. Certainly, in that way he got a good knowledge of the law, and that had stood him in good stead since. As to statutory notices in regard to light, they were simply notices that you object to the light being opened over your premises, and in that way prevent the light becoming an ancient light. That was better than putting up a screen or building a wall. He was aware that there was no law of light in America or France, but in France there was a law which did not allow you to open a window on your own premises, except within a certain distance of your neighbour, which was a sort of compensation. As to costs of arbitrations and the fees payable, the arbitrator's or umpire's fees were a matter which was sometimes fixed by custom, sometimes by agreement, and sometimes by a sort of scale. A case of an arbitrator not being paid his fee because his award was not taken up, did not often occur, and he had had no such experience. The arbitrator could guard himself against that by doing as the arbitrator did in the dispute about the erection of Tilbury Docks, *i.e.*, by refusing to sit unless he received his fee every morning at eleven o'clock; and there were circumstances which made him (the speaker) think the arbitrator in that case was right. The custom as to taking up of awards was simple. The arbitrator made his award, wrote upon it the amount of his fee, and left it with the solicitor, and the award was not surrendered until the fee was paid; but in party-wall cases it was usual to arrange what the fee should be, and to give up the award trusting to the honour of the architects, surveyors, and their clients, and he might add he had never been disappointed in trusting to their honour. As to the right to ancient lights, if he expressed his private opinion, apart from decisions in particular cases and apart from the law as it stood, he must say he quite agreed with what had been said, and particularly with Mr. Hare's remarks. Ancient lights were a shameful imposition on the neighbouring owner or occupier, and how such a law should have come into existence and have grown he could not understand; but the law existed, and the Joint Committee were doing the best they could to minimise the hardship, rather than attempt the impossible, *i.e.*, the abolition of all rights. He trusted that the draft Bill would be published in a short time. He might say that the Surveyors' Institution made some amendments in what had been passed by the Council of the Institute and by the Joint Committee, and those amendments had to go before the Institute to be agreed to. There was no doubt that the Bill, if it became law, would do a great deal to do away with disputes as to ancient lights, particularly by the procedure proposed, which would be like that under the Factory Acts or as to party walls. The delay and the stoppage of building work would be avoided that now took place when interim injunctions were granted, and if the Bill became law it would really abolish the first Court—the Court of Chancery—and appeal from the decision of the Tribunal of two or three surveyors would be to the Divisional Court or the Court of Appeal and an injunction would be granted within a fortnight. The angle of 45 deg. was a rough mode of settling disputes, and he had known cases where an angle of less than 45 deg. vertical did less harm. Every case had to be considered on its own merits, and it was impossible to lay down any one angle which would cover all points. Again, as to quantities forming part of the contract, the subject was too large to enter upon then. The usual course where they did not form part was for the builder to contract to do the work shown on the drawings and specifications, and the surveyor who had taken out the quantities was responsible to the builder for their correctness. He had purposely neglected to mention the Tribunal of Appeal under the London Building Act, because it was not a tribunal of arbitration at all. It was a tribunal appointed under certain circumstances, and was as much a court of justice as any court in the whole of England. It was really a legally constituted Court of Appeal. As to whether party wall awards were necessary, they were not necessary if they were not wanted. In nine cases out of ten no award was made; an agreement was come to and the building-owner carried out his ideas with the consent of the adjoining owner; but in law there must be an award if there was a dispute. If the adjoining owner did not give his consent within a given time, the Act said that the difference could only be settled by an award. Of course, the award could be made without reference to the third surveyor, and that was often done. He thought it was rather hard to say that the adjoining owner's surveyor appeared to be most concerned as to his fees. In his experience, the adjoining owner paid his own costs, and the surveyor had a great deal of trouble and responsibility. It was true that recent decisions as to dilapidations had made it easier for the tenant. Formerly, if a man drove a nail into a wall he had to pay for repapering the wall. As to the Chamber of Arbitration, to which reference had been made, they appointed a large number of arbitrators, of whom he was one, but he had never heard of it since—nor did he know that he wanted to, in consequence of the idea of that Chamber as to what was an adequate fee for a professional man. Much could be done by friendliness in trying to bring the parties together in arbitration, and that should always be done where possible, instead of proceeding to extremities. In reference to what Mr. Satchell had said as to how he had been helped by him (the speaker) on one occasion, if any junior member of the profession was ever in difficulties, and would like to go to him, he would always be glad to place his services at his disposal.

The Chairman announced that the next meeting would be held on May 9, when the following papers would be read: "Artisans' Dwellings, from the Municipal Point of View," by Mr. Owen Fleming; and "Artisans' Dwellings, from the Private Point of View," by Mr. L. Ambler. On the same date the result of the election of officers would be made known.

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS.

THE sixth and last spring visit was paid on April 26 to Perry Vale Fire Station and the Horniman Free Museum.

Mr. Owen Fleming, of the L.C.C., met the members at the new fire station, and first of all gave a short sketch of the history of the fire brigade. Since the brigade was taken over by the County Council, the improvements both in buildings and efficiency have been great, and it was therefore hardly a surprise to hear that the brigade had doubled in size in twelve years, and at the present time new stations are being designed at the rate of one in every two months.

The old stereotyped Gothic building familiar to Londoners has become a thing of the past, and the new buildings are far more in accord with the age and with the care and attention which is at last being paid to the well being and health of the men. A new departure is being tried, and has been put into effect at the West Hampstead Station, where the men are housed in cottages instead of in flats over the engine-room, and it would be instructive to know if this attempt at a more homely and natural method of housing is really a success as regards efficient working.

Mr. Fleming explained that the new system of the horsed escape which goes out first to a call introduced by Captain Wells has led to some slight modifications of plan, and necessitates an engine-room of not less than 40 ft. in length by 27 ft. wide, and by increasing the width to 28 ft. 3 in. the escape and engine are interchangeable in position.

These smaller stations have a crew of twelve; an officer, two coachmen, and nine men. The four horses are stabled immediately at the back of the engine-room, each stall having a door in front of the horses's head. There is a side entrance to a yard which abuts on to the stable and engine-room, so that when returning the escape and engine are brought direct into the yard and thence into position in the engine-room without having to be turned round or backed in from the front in order to place them in their proper position for exit. Immediately to the left on entering the engine-room is the watch-room, described by Mr. Fleming as "the brain of the building," for it is here that the whole system of communication between the street alarms, ordinary and sub-stations, and the central station culminates, and from which is arranged a complete system of speaking tubes and bells to the men's quarters. At night four men sleep in this room, the beds being portable folding trestles.

A capital recreation-room is provided with a billiard-table, as though the men have a good deal of time off duty, they must, of course, be in the station, and proper and adequate recreation is necessary.

In the basement is a washhouse with three copper coppers, and three sets of washing troughs. Provision is made for drying the men's clothes, a temperature of 120 deg. with free circulation of air accomplishing this in two hours.

The men's quarters above comprise living-room, one or two bedrooms, and small scullery. Some are provided with baths in a lobby, which are used in common.

The hose-tower is a necessary adjunct, though no longer used as a watch-tower. The hose, in 100 ft. lengths, must be dried quickly, or it rots, and thus 50 ft. of hanging space must be provided.

The general aim throughout the building is to minimise annual expenditure; glazed bricks are therefore used wherever possible, windows and doors are made in teak and left oiled, and thus not only is labour in cleaning saved, but the yearly up-keep in repairs is considerably reduced. Externally, glazed bricks are used to the ground-floor story and rough-cast above, with Portland stone dressings and tile roofs, and the general effect is very pleasing.

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Fireplace, Duddingstone House. Designed by Sir William Chambers.

Throughout, the whole building is stamped with a directness and simplicity of treatment which has its own architectural reward, and though, in a sense, purely utilitarian, it again proves that true architecture can and should be made subservient to the needs and necessities of the age we live in rather than be a mere ornamental adjunct.

It should be mentioned that the Brigade "turned out" very smartly for the benefit of members, and after a hearty vote of thanks had been passed to Mr. Fleming, a move was made to Mr. Harrison Townsend's building, the Horniman Free Museum.

This most interesting building has been described and illustrated in the *Builder* for February 8 last, and therefore a long account is scarcely needed. Mr. Townsend has had a difficult problem to face: a long narrow site on rapidly rising ground, with a clay foundation. The difficulty of the levels has been well overcome by making the floor of the inner gallery on the same level as the balcony to the first gallery. The roof is entirely of iron construction, forming a large semi-circular top-light, the ribs being covered internally with fibrous plaster with broad and bold mouldings. The main ribs are carried right down to the ground by means of stancheons which are there anchored in concrete beds, the whole roof being practically carried independently of the walls.

The general treatment is plain and dignified, if, perhaps, somewhat lacking in colour. Externally, the front elevation and clock tower are in Doulting stone, and are certainly original in treatment and detail. The latter is curious, and strikes one at once as being more suited to a plastic material, such as terra-cotta, rather than a free stone.

The well-known mosaic designed by Mr. Anning Bell has unfortunately suffered, it is said, from a gas generated in the materials behind it, and the colours are so low in tone that its distinctive character seems somewhat lost and unsufficing. The bronze inscription panel by Mr. F. W. Pomeroy was much admired and noticed.

A visit was paid to the interior of the clock tower, which is 68 ft. high to the centre of the 10 ft. 6 in. dial, and some useful hints were obtained from Mr. A. W. Jarvis, who, in Mr. Townsend's regrettable absence abroad, most kindly met the members and explained the various plans and the difficulties which had to be met and overcome.

There is no doubt that the Museum forms a remarkable addition to the art treasure houses of London, and is in itself an educational influence of some value, by reason of its unconventionality of treatment.

REREDOS AND SCREEN, ST. THOMAS, HEIGHAM, NORFOLK.—On the 24th ult. the Lord Bishop of the Diocese attended at the Church of St. Thomas, Heigham, and dedicated a reredos and choir screen. The new reredos is constructed of Caen stone. It occupies the whole width of the east end, the centre width being 26 ft., and the extreme height 11 ft., and its style is of the fifteenth century. The work was carried out by Messrs. Harry Hems & Sons, of Exeter. The choir screen, which has been built at the east end of the south aisle to correspond with the clergy vestry on the opposite side, was by Mr. W. Wilkin, jun.

FIREPLACE, DUDDINGSTONE HOUSE.

THIS fireplace from Duddingstone House, of which Sir William Chambers was the architect, was photographed, among other details of the house, to illustrate the article on Chambers in our first issue of the present year. There was not, however, space for it on that occasion. We give it as an example of a chimney-piece with a certain individuality of style, though we must confess that we do not like the ragged line made by the angle of the frieze.

COMPETITIONS.

PUBLIC LIBRARY, KINGSTON-ON-THAMES.—Mr. Basil Champneys, the assessor in the recent competition for a public library, Kingston-on-Thames, has selected the design sent in by Mr. A. Cox, of Adam-street, Adelphi.

OFFICES FOR THE ECCLESALL BOARD OF GUARDIANS, YORKSHIRE.—The Board some time ago decided, in consequence of the inadequacy of the present offices, to erect a new building on land on the opposite side of Union-road. A number of plans were sent in by different architects, and Mr. A. H. Goodall, of Nottingham, was appointed assessor. The plans were also considered by the Buildings Committee, and the latter and the assessor both agreed on one set of designs—those sent in by Messrs. Ellis Brothers, Orchard-street, Sheffield. The Board adopted the decision of the assessor. The new buildings will cost 7,000*l.*, exclusive of furnishing. The plans placed second were those submitted by Messrs. Hall & Fenton, St. James's-row; and third, Mr. Joseph Norton,

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of Norton Woodseats. The architects who were second and third will receive awards of 15*l.* and 10*l.* respectively; the 25*l.* offered as the first premium being merged in Messrs. Ellis Brothers' commission.

Illustrations.

THE BIRMINGHAM UNIVERSITY.

THE Birmingham University, which is at present inadequately housed in the building known as Mason's College, is about to erect for itself new and more complete buildings adapted to its growing needs on a site of 25 acres of freehold land generously given by Lord Calthorpe for the purpose.

Our illustrations explain the general scheme for the buildings, showing both the complete plan and, by a darker tint, those portions which are to be immediately proceeded with.

There is a rapid fall on the site from the north to the south of about 30 ft., and the natural contours of the ground suggested the semi-circular treatment as the best adapted to its configuration. The site has accordingly been prepared on two semi-circular terraces, with a difference in level of 16 ft. This preliminary ground work and the new University-road have already been carried out under the direction of Messrs. Thomas & Bettridge.

It is intended that when completed the buildings shall comprise all the departments necessary for the purpose of a modern University devoted to scientific instruction in many subjects and especially those which have a bearing on the several trades and manufactures of the Midlands together with the usual University training. The subjects provided for embrace mechanical, electrical and civil engineering, mining, metallurgy, applied chemistry, agriculture, veterinary science, brewing, botany, zoology, geology, commerce, law, and also a faculty of arts, where history, classics, modern languages, psychology, logic, and philosophy will have a place, and others will no doubt be added as time goes on.

The main or ceremonial entrance will be from the new University-road, along which the future administrative and other buildings will be ranged. Passing under a lofty tower and across a grassy court, the principal entrance leads into an entrance-hall 50 ft. square, from which the main corridor 12 ft. wide runs right and left, and from which access is obtained to the workshops, lecture theatres, professors' rooms, laboratories, &c.

The Great Hall, 150 ft. by 75 ft., occupies the centre of the series. Under it are the students' bar, the dining and common rooms, the staff dining and common rooms, and on a lower floor which, by the fall of the ground at this point, is a ground floor, the kitchens and offices are arranged.

The everyday entrance to the University will be from the south along a new road branching out of the public road. Here the bulk of the students will most easily gain access to the several departments in which they are engaged. Commodious cycle stores adjoin the entrance, from which, by a flight of broad steps, the lower plateau is reached, and into the lower corridor, which conducts to every part of the establishment.

The circular ring of buildings only is carried up to the first floor, on which museums, libraries, reading-rooms, &c., are placed. The radiating blocks of two floors each contain workshops, each 160 ft. by 50 ft., with additions at the southern ends 50 ft. by 40 ft., two blocks being devoted to engineering and one to mining and metallurgy, which, together with the Great Hall, are to be at once built.

In the south-west angle of the site a complete light and power station, with foundries and forges and other accessories, will be placed, and in the north-east angle a club and gymnasium are to be eventually erected overlooking the recreation-ground.

An underground conduit or subway will connect the power station with the whole range of buildings, and in it will be gathered all steam and other mains, electric light cables, &c. The power station itself, with its numerous accessories, will play a part in the education of the students, and as such will be on a proportionately liberal scale, and finished and fitted in a special manner.

It is proposed to face the several buildings with red bricks, and to use Portland or Darley Dale stone for the dressings. In the interior glazed bricks will be freely used, and the whole will be fireproof.

The deep friezes on the front across the museum pavilions, &c., are intended to represent the sciences and industries, to the elucidation of which the several blocks of buildings are devoted, and that over the central entrance will bear relation to the function of the University at large. Beneath it the arms of the neighbouring counties which have contributed to the University will be carved, and an extract from one of the Chancellor's addresses on the objects of the foundation will run across the façade.

The design is exhibited at the Royal Academy, though unfortunately (as noted in our article on another page) hung too high to be properly seen.

ASTON WEBB AND E. INGRESS BELL.

ORGAN-CASE FOR HAILEYBURY COLLEGE.

THE organ-case illustrated has been designed for a large organ, recently built over the west-end of the chapel of Haileybury College. The design of the existing building, with an arcade into a chapel shown in the right-hand corner, had to be taken into account in the design for the organ gallery and the projections of the case.

The case is of deal, painted, and is to be richly carved. The work has been executed by Mr. S. A. Hunt, of Hoddesdon, from the designs of Mr. Reginald Blomfield, of London. The drawing is exhibited at this year's Royal Academy.

RECENT DESIGNS FOR WALL-PAPERS.

THESE illustrations are photographed from specimens lent by Messrs. Jeffrey & Co., the well-known wall-paper makers, of some of the most recent designs made for them by various artists. As we cannot reproduce the colour, we have preferred to give them in a quiet neutral tint, so as to avoid any suggestion of colour and emphasise the fact that they represent only the line design and the method of treating floral forms as ornament. The values of light and dark are fairly suggested however, except in the "Pansy" and "Tulip" designs, where the blossoms in reality show lighter than the rest; a yellow tint, as is well known, always coming out dark in photography.

The designs include a frieze by Mr. Walter Crane, three papers by Mr. Heywood Sumner two by Mr. A. F. Vigers, and one by Mr. A. F. Rose.

Of the designs we prefer Mr. Crane's frieze and Mr. Sumner's staircase paper, both of which are fine and effective designs; and the "garden arbour" paper is a pretty fancy for a nursery or perhaps a breakfast-room. Of the other four, while we give them as examples of what is being done in this class of design, we must say that we regard them with little sympathy, and consider that they show a much too realistic use of natural foliage as ornament, or, if realistic is not exactly the word, a lack of severity of line and of conventionalism in detail. That, however, seems to be the direction to which the taste even of the better instructed class of persons is declining at present, and that their demand has to be met; but we regret it. Messrs. Jeffrey have much better designs than these in their showroom.

In connexion with the subject, we may congratulate the firm on having secured West-End show rooms in Mortimer-street, so that the purchaser who wishes to go where he can have the chance of finding the best wall-papers in London has no longer to undertake a "Sabbath day's journey" to Islington. At the back of the new premises is a long show-room, top-lighted in a very successful manner, the wall hung with a simple paper in a low green, designed by Mr. Walter Crane, and finished by the frieze of which the design is illustrated here, the rich tints of which contrast effectively with the sober green paper below. The new showroom will probably prove an advantage to the firm as well as a convenience to their clients.

LAND TRANSFER.—At the Building Societies' Association's meeting, to be held at Cheltenham on May 29 and 30 next, two papers will be read on the Land Transfer Act, 1897, one in favour of compulsory registration of title and the other against. On the invitation of the Committee, Mr. C. G. Cutler, Secretary of the West London Building Society, will read the first paper, and the second will be read by Mr. J. S. Rubinstein, solicitor.

ARCHITECTURAL SOCIETIES.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—The annual Report of the Leeds and Yorkshire Architectural Society states that the Council have pleasure in reporting a considerable increase in the membership of the Society. There are now sixty-three Members, forty-six Associates, and twenty-six Honorary Members (a total of 134), representing an increase of four Members, twelve Associates, and seven Honorary Members. The following paragraph in the Report is of sufficient interest for quotation:—

"The Council of the Society raised an objection to the assessor for the new baths at Bramley and York-road, Leeds, nominated by the Leeds City Authorities, on the grounds that the assessor in such a competition should be an expert in the design and construction of baths. The Council also suggested the names of some architects who would meet with their approval if appointed to the post of adjudicator. The assessor, though verbally expressing his willingness to refer the matter to the Leeds Town Clerk, refused to withdraw from his appointment, and awarded the premiums. The Council of this Society laid the correspondence with the assessor before the Council of the Royal Institute of British Architects, asking them to endorse the action of this Society. This the Council of the Royal Institute refused to do, stating that they considered it sufficient that an architect on being appointed an assessor in any competition should make such inquiries as would qualify him to judge of the merits of the designs submitted, whether he were a specialist in the particular kind of building to be erected or not. The Council of the Society wrote to the Council of the Royal Institute, saying that they could not agree with them in their decision."

We think the Institute were quite right in their reply. The power of grasping what is required in a special form of building, and judging whether the problem has been solved in the best way, depends much more on the mental capacity of the assessor and his general knowledge of plan, design and structure, than on the mere fact of his having himself erected a building of the same class. Nor does the fact of a man having erected a building of a particular class necessarily make him the best judge of the designs of others. He may have built a bad one himself.

MANCHESTER SOCIETY OF ARCHITECTS.—At the annual general meeting of the members of this Society, held on April 24, the following officers and Members of Council were elected: President, Mr. Alfred Darbyshire, F.R.I.B.A., F.S.A.; Vice-Presidents, Mr. J. B. Gass, F.R.I.B.A., and Mr. J. W. Beaumont, F.R.I.B.A.; hon. secretary and treasurer, Mr. Paul Ogden, F.R.I.B.A.; assistant hon. secretary, Mr. George Brown; Members of Council, Messrs. B. W. H. Brameld, John Ely, F.R.I.B.A., E. Hewitt, F.R.I.B.A., J. S. Hodgson, J. Horsfall, F.R.I.B.A., J. D. Mould, F.R.I.B.A., W. A. Royle, F.R.I.B.A., J. H. Woodhouse, F.R.I.B.A., P. S. Worthington, M.A., A.R.I.B.A. (Fellows); and Messrs. F. B. Dunkerley, A.R.I.B.A., A. H. Mills, A.R.I.B.A., and Isaac Taylor (Associates). The thirty-eighth annual report stated that the aggregate membership was 193—viz., 92 Fellows, 52 Associates, and 49 students—as against a membership of 182 at the date of the last report. The proposal to create a Chair of Architecture at Owens College had received much and careful consideration at the hands of the Council of the Society, and during the past year several conferences had been held. No effort would be spared by the Council to further so desirable an object. —It having come to the knowledge of the Council that the Manchester Corporation were contemplating the erection of the Victoria Baths in High-street without first inviting architects in practice to send in competitive drawings, the Council passed a resolution which expressed satisfaction that the suggestion of the Council with regard to the appointment and duties of the city architect had been approved by the City Council, but urged that it was desirable that such an important work as was contemplated in the erection of the Victoria Baths, involving a large expenditure, should be thrown open either to limited competition or generally to local members of the architectural profession. The examinations of the Royal Institute of British Architects for the north-western division of the country had been conducted by the Council of the Society in conjunction with the Royal Institute of British Architects. In the Preliminary examinations forty-nine students were examined, and thirty-four passed. In the Intermediate examination twenty-two were examined, and thirteen

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passed. Reports of the Education in Architecture Committee and of the Competitions, the Library, and the Students' Committees were appended. A satisfactory balance-sheet was presented. The reports and financial statement were adopted.

LIVERPOOL ARCHITECTURAL SOCIETY.—The annual meeting of the Liverpool Architectural Society (Incorporated) was held in the Law Library, Cook-street, on the 21st ult., the chair being occupied by Professor Simpson. The Council, in their annual report, drew attention to the fact that the year had witnessed the second attempt to provide Liverpool with a cathedral. During the spring of 1901 it was rumoured that a committee of prominent Churchmen, who were investigating the advantages of the various sites, had decided on the blunted triangle known as Monument-place; but to the surprise of nearly all architects, it was announced that they had selected St. James' Mount. The Council took immediate steps to protest: they drafted a Report which was adopted by the Society at a special meeting, and sent to the Press and the members of the Cathedral Committee. Owing to unforeseen circumstances no protest could be made at the public meeting held in the Town Hall on June 17, when the choice of the St. James' Mount site was ratified. The Council, although deeply regretting the decision of the meeting, had taken no further steps to oppose what was evidently the wish of the majority of those outside the profession. On the motion of Mr. E. W. Willink, seconded by Mr. T. E. Eccles, the report was adopted. The following gentlemen were elected as officers of the Society:—Mr. John Woolfall, President; Messrs. T. E. Eccles and P. C. Thicknesse, Vice-Presidents; Messrs. Hastwell, Grayson, and Gilbert Fraser, Hon. Secretaries; Messrs. H. L. Beckwith and W. G. Dobie, auditors; Messrs. James Dod, Henry Hartley, E. P. Hinde, E. A. Ould, S. Pergin Powell, and W. E. Willink, Professor Simpson, Mr. E. G. Dickinson, and Mr. Arnold Thornely, members of Council. The Chairman suggested that the members should take into consideration the dealing with the George's Dock site, which was one of the most important positions in Liverpool, and one that concerned everybody, especially architects. He explained that the Estate Committee had been asked to receive a deputation of the Society, so that the views of the members could be laid before the Committee. A formal reply had not been received, but he understood that the Committee were willing to receive the deputation. Mr. Willink briefly explained the details of the plan which had been prepared. After some discussion, it was moved by Professor Simpson, and seconded by Mr. Grayson, and adopted—"That this meeting of the Liverpool Architectural Society approves the suggestion of the Council, that the whole space, or as much as possible, should be left open, between the continuations of Water-street and Brunswick-street, and that a wide building should be built on the north side to balance the Dock Offices." Messrs. P. C. Thicknesse, A. Thornely, and Professor Simpson were elected to form the deputation. A vote of thanks to the Chairman concluded the proceedings.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—On April 24 Mr. F. W. Meyer, landscape gardener, read a paper before the Society at the Athenæum, Exeter, on "Garden-making." He said that unfortunately architects and landscape gardeners did not always work in harmony together. The architect who designed a handsome building and the landscape gardener or garden architect who designed a garden were generally both actuated by the very laudable desire of making the most of their profession. This was as it should be, and by working hand in hand, as it were, the work of one might be greatly facilitated and even enhanced by the work of the other. Sometimes, however, it happened that the architect who designed, say, a mansion and superintended its erection laid out not only the immediate surroundings of that mansion, but the whole of the grounds as well. In ninety-nine cases out of a hundred such procedure must prove disastrous unless the architect was also a specialist in horticulture. Designing a garden did not depend merely on the rules of architectural symmetry or hard and fast rules of design. Though in a large garden adjoining a mansion the immediate surroundings should, if at all possible, be in harmony with the style and character of the building, the principal and the most pleasing effects of every garden could never be attained by stones, bricks, and mortar, or any other *dead* material; but must in all cases depend on the living and ever-changing materials of grass, shrubs, trees, flowers, &c., combined in such a way as to form a pleasing picture, not only in themselves but also as a whole, and to amalgamate and blend harmoniously even with the landscape beyond the garden. Without an intimate knowledge of trees, shrubs, and plants generally, no architect could design a good garden. His garden might look all right immediately after completion, but what would it be like, say, five or ten years hence, when the trees and shrubs had assumed larger proportions? The material of which a mansion was built changed neither in size nor in shape, but the material of which a garden was composed changed in both, and thus made it necessary for the designer to look many years ahead. He would most emphatically maintain that no good garden could be designed without its designer having a thorough knowledge of the plants to be used and the effect which they would produce, not only immediately, but, say, ten years or more after the work was complete. Some few years ago he read a book on the subject of "The Formal Garden," written by an architect, and was amazed to find in it a sentence to the following effect:—

"For the designer of a garden it is no more necessary to know anything about plants than it is necessary for a bricklayer to know how his bricks were manufactured."

He had nothing to say against a formal garden in the right place; but a formal garden, or any other garden, arranged on such lines as those quoted above, without a knowledge of plants, could, in his opinion, be never anything else but an absurdity. He would not condemn formal gardening altogether. On the contrary, he was strongly in favour of giving small gardens a more or less regular shape, and also in large gardens the immediate surroundings of the house should be in keeping with the regular style of the house, and the transition from the regular to the irregular style should be a gradual one. Since the architect and the landscape-gardener necessarily looked upon their respective work from entirely different standpoints, it was only right and just that when a new garden was to be designed in conjunction with a new house, the architect and the landscape-gardener should compare notes and then work hand in hand. But for an architect alone to lay out a garden was, he thought, as grave a mistake as it would be to employ a landscape-gardener to design a cathedral. To lay down hard and fast rules whether a garden should be in the geometrical regular style, or in the natural style was impossible. It was not merely a matter of taste, but must largely depend on existing circumstances and especially on the surroundings. But broadly speaking, he thought that of modern gardens the most pleasing ones were those which did not too rigidly adhere to either the geometrical or the natural style, but were a pleasing combination of both, and were, above all, in thorough harmony with their surroundings. When a sudden change is introduced there should be a visible motive forming, as it were, a connecting link between the different styles, which would otherwise give the garden the appearance of being the property not of one man but of different owners. Not contraction within narrow limits, but expansion must be the aim, and if by skilful treatment they could introduce an artificial perspective, a comparatively small garden might not only be made to appear much larger than it really was, but might be actually amalgamated with the distant landscape beyond, a result which in most cases would be found most satisfactory from every point of view. In order to give a better idea of the development of garden design and of the various styles of gardens he could not do better than show on the screen a series of pictures of ancient and modern gardens, which more clearly than words would illustrate what to do and what to avoid. [A large number of lantern slides were then exhibited and explained by Mr. Meyer, showing gardens in the most ancient as well as in the most modern styles, and included among others ancient Egyptian, Chinese, Japanese, and Roman gardens, gardens of the Renaissance period, modern English, French, German, and Swiss gardens, various styles of terraces (including the "undulating" terrace), and lastly a number of parks and pleasure grounds, rock and water gardens of Mr. Meyer's own designing, and laid out and planted by Messrs. Robert Veitch & Son, of Exeter.]

YORK ARCHITECTURAL SOCIETY.—At the annual general meeting of this Society the officers elected for the ensuing year are as follows:—President, Mr. C. H. Channon, F.R.I.B.A.; Vice-presidents, Messrs. A. B. Burleigh and T. Monkman; committee, Messrr. S. Needham, E. A. Pollard, A. G. Toomes, J. W. Biscomb, and H. C. Cannell. The hon. treasurer is Mr. T. Monkman; hon. secretary, Mr. Frank Ranly; and hon. librarian, Mr. S. G. Highmoor.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—On Saturday, April 26, a large party of the members were enabled by the courtesy of the Board of the Corporation to visit the Trinity House Depot at Blackwall. Under the guidance of Mr. John Williams, the superintendent, and other officers, a complete inspection was made. The party also went on board the lightship lying alongside the wharf, the hot-air engines for air compressing and the other appliances being shown in operation. After leaving the wharf the party proceeded to Green's dry dock, and were shown over the Trinity House T.S.S. *Irene*. The workshops consist of superintendent's and clerks' offices, engine house, carpenters' and patternmakers', smiths', boilermakers', coppersmiths', lampmakers', fitting and erecting shops, chain cable, and general proving house, and gasworks for making oil gas, and compressing it for buoy illumination. The plant consists of a 16-n.h.p. horizontal non-condensing steam-engine, and tools of the ordinary kind, suitable for the special requirements of the service. The works executed include repairs to the machinery of the Corporation's steam vessels (eleven in number), the illuminating and fog signal machinery and apparatus of lighthouses, light vessels, and lighted beacons and buoys; repairs to day beacons and buoys; conversion of worn chain cables from light vessels to buoy service, &c. The number of workmen employed is, on an average, about 150. A 10-ton steam travelling crane is employed for lifting the buoys, sinkers and other heavy weights. The buoy store is surmounted by two lighthouse lanterns, which are used for experimental purposes in connexion with lights and fog signals. Immediately above the buoy store is a long, dark chamber, used in testing photometrically the powers of different kinds of burners and apparatus. A wrought-iron crane is attached to one of the lanterns for firing explosive fog-signal charges, electrically. At the next meeting on May 2, a paper "On Some Factors in Colonial Railway Construction" is to be read by Mr. Lewis H. Rugg; and on Saturday, May 10, a visit is to be paid to the Great Eastern Railway Works at Stratford.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL general meeting of the Institute will be held on Monday next to elect the Royal Gold Medallist for the current year. The Chairman will move—That, subject to his Majesty's gracious sanction, the Royal Gold Medal for the promotion of architecture be presented this year to Mr. Thomas Edward Collcutt for his work as an architect.

The annual general meeting will then be held. At the same meeting the Institute will be asked to sanction the issue of a form of agreement and schedule of conditions for building contracts for use where quantities form part of the contract, the document being based on the form now in use with such variations as are necessary to meet the requirements of the proposed new form. The following are the clauses of the existing form which have been modified by the Practice Standing Committee to adapt them to the new purpose, the alterations and additions being printed in italics:—

1. The works shall be carried out in accordance with the directions and to the reasonable satisfaction of the architect, in accordance with the said drawings and specification *and bills of quantities*, and in accordance with such further drawings, details, and instructions in explanation of the same as may from time to time be given by the architect. . . . The contract drawings and specification *and the priced bills of quantities* shall remain in the custody of the architect, and shall be produced by him

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at his office as and when required by the employer or by the contractor.

3. The contractor shall on the signing hereof furnish the architect with *the fully priced bills of quantities* for his use or that of the surveyor appointed as in Clause 13 hereof, and for the purposes only of this *contract*.

Clause 13.—The penultimate sentence to read :—

The variations shall be valued at the rates contained in the *priced bills of quantities*, or, where the same may not apply, at rates proportionate to the prices therein contained.

27. The words "prime cost" or the initials P.C. applied in the specification *and bills of quantities* to goods to be obtained and fixed by the contractor, shall mean, unless otherwise stated in the specification *or bills of quantities*, the sum paid to the merchant after deducting all trade discount for such goods in the ordinary course of delivery, but not deducting discount for cash, and such sum shall be exclusive of special carriage, the cost of fixing, and contractor's profit.

28. The commencement of the clause to read :—

The provisional sums mentioned in the specification *and bills of quantities* for materials to be supplied or for work to be performed by special artists or tradesmen, &c.

Such slight changes as are required in the preamble and agreement clauses will be called attention to at the meeting.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. M'Dougall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Lambeth Borough Council 2,515*l.* and 7,210*l.* for paving works, and to sanction a loan of 7,295*l.*

Trafalgar-square.—On the Report of the General Purposes Committee,

Mr. Beachcroft asked whether something could not be done to mitigate the extreme ugliness of the hoarding in Trafalgar-square, which would be in existence for the next two or three months.

Mr. Robinson replied that he would communicate with the Works Committee.

Mr. Beachcroft also suggested that the Parks Committee and the Office of Works should do something in the way of floral decoration in Trafalgar-square on the occasion of the Coronation.

Mr. Robinson promised to make inquiries in the matter.

The Works Department.—The Fire Brigade Committee recommended that the erection of a fire brigade station at Mile End should be entrusted to the Works Committee at an estimated cost of 10,163*l.*

Mr. Goodrich moved an amendment in favour of advertising for tenders. Money would be saved by putting the work out to contract.

Mr. Fletcher seconded the amendment on the ground that this was not a class of work which should be given to the Committee, in view of the great losses already made by that Department in carrying out building works.

Mr. Torrance said the Department had been eminently successful in this kind of work, and the criticisms they had just heard were very unfair.

Mr. Cousins said Mr. Torrance's last remarks were not correct. At New Cross fire station, erected by the Department, the excess was 3,000*l.* over the estimates, and at Whitefriars the excess was 2,000*l.* over the estimate. There were two fire stations which had been erected by the Department at a cost below the estimates, but the total in all fire brigade work was against the Department.

Mr. Allen, Chairman of the Fire Brigade Committee, pointed out that the Council had recently reaffirmed its determination to have a Works Department, and if that Department was to enter successfully upon its new career it must have work given to it. The Department had in the past carried out splendid work for the Fire Brigade Committee, and he hoped the Council would support their recommendation.

Upon a show of hands, the amendment was rejected, and the recommendation was adopted.

The Works Manager.—The Council on January 28 last accepted the resignation of Mr. W. Adams, manager of works, as from a date to be thereafter fixed. The General Purposes Committee now recommended that the resignation of Mr. Adams should date from May 31 next.

The recommendation was adopted.

Road Opening in Piccadilly.—On the Report of the Improvements Committee,

Captain Hemphill complained that the new extension of the roadway in Piccadilly had been opened up a short time after it was laid down, and asked who was responsible.

Mr. Davies, Chairman of the Committee, said the work had been done by an electric lighting company under the orders of the City of Westminster Council. It had, however, been arranged that no further work of the kind should be done until after the Coronation.

Holborn to Strand Improvement.—The Improvements Committee reported that the hoarding and shoring in connexion with this improvement, as carried out by the Works Department, amounted up to the present to 479*l.*, while the sale of old materials realised 1,127*l.*

Sewer Work.—On the recommendation of the Main Drainage Committee, it was agreed that the expenditure of 359*l.* 19*s.* 3*d.* incurred in excess of the vote of 13,115*l.* passed for the extension of the middle-level sewer, and the construction of a new sewer in Scrubs-lane as well as a length of sewer in connexion with an overflow from the Counter's-creek sewer, be sanctioned.

It was also agreed that the expenditure of a further sum of 855*l.* 8*s.* 6*d.* be sanctioned for repairs to the middle-level sewer between Old Ford and the Abbey-mills pumping-station, and that the expenditure of 2,217*l.* 4*s.* 5*d.* incurred in repairing damage done by an explosion to the Wick-lane branch sewer near Smeed-road, Old Ford, be sanctioned.

Elephant and Castle Theatre.—The Theatres and Music-halls Committee reported that the Council's suggestions for improving the structural conditions of the Elephant and Castle Theatre were either in hand or had been carried out. Plans had been submitted to the Committee by Mr. Woodrow, showing new refreshment-bar accommodation in connexion with the gallery and circle. It was intended to reduce somewhat the area of the bar accommodation. On the ground floor it was proposed to convert the space beneath the circle entrance stairs into an early entrance to the pit. The Committee recommended the Council to approve these arrangements.

The Report was adopted.

Marlborough Theatre.—The Committee further reported that new plans had been submitted for the proposed Holloway Theatre in Holloway-road, which was now intended to be known as the Marlborough Theatre. Alterations in the plans had been rendered necessary owing to the new regulations of the Council. If Macready-place were not used as a carriage-way, the site would comply with the regulations. The theatre would accommodate 2,380 persons, viz., 1,886 seated and 494 standing. It would be within the jurisdiction of the Lord Chamberlain.

The Council approved the amended plans.

Montpelier Music-hall.—It had been reported to the Committee that during a performance at the Montpelier Music-hall, Newington, on the evening of April 18, the exit doors at the end of the passages leading from the stage and stalls and from the centre of the hall were chained and padlocked. The Committee observed that it was hardly necessary to point out how important it was in the interests of the public safety that the exit doors at places of public entertainment should not be fastened while the public were in the building, except in such a manner as to allow them to open automatically on pressure being applied to them from within. The Council authorised the Committee to serve a notice under the forty-fifth section of the Act of 1882.

Office Accommodation.—The Establishments Committee recommended that the Council do take on lease for twenty-one years, determinable by the Council at the end of seven or fourteen years, certain accommodation on the ground floor and basement of the premises, 19, Charing Cross-road, at a rent of 750*l.* a year.

The Chairman of the Committee, Mr. Henry Clarke, in answer to a question, said that the Council already paid 19,000*l.* per annum in the way of rent, and they occupied eighteen premises other than the County Hall.

The recommendation was agreed to.

Central Store, Millbank Estate.—On the recommendation of the Housing Committee, it was agreed that the estimate of 900*l.* submitted by the Finance Committee in respect of the cost of the construction of a central store on the Millbank estate be approved ; that the work of constructing the building be entrusted to Messrs. Spencer, Santo, & Co. on the same schedule of prices as that at which they are erecting the remaining dwellings on the estate ; that the work be done as an extra upon the present contract with Messrs. Spencer, Santo, & Co. ; and that the Housing of the Working Classes Committee be authorised to at once put the work in hand on the terms mentioned.

Tramway Tenders.—The following recommendations of the Highways Committee were agreed to :—

"That the estimate for 1,800*l.* on capital account submitted by the Finance Committee be approved ; and that the Highways Committee be authorised to expend, in connexion with the reconstruction for electrical traction of the London County Council tramways, a sum not exceeding that amount in lowering the carriage-way of Clapham-road under the South-Eastern and Chatham Railway bridge, and in repaving with new wood blocks the portion of the carriage-way outside the tramway tracks. That the offer of Messrs. Griffiths & Co. to carry out, for the sum of 1,712*l.* 2*s.*, the work above specified, in accordance with the specification prepared by Dr. Kennedy, the Council's consulting electrical engineer, be accepted."

"That the arrangement with Messrs. P. & W. Maclellan, Ltd, and with Mr. Leonard Cooper, made by the Highways Committee, relative to the supply of track rails and patent sole plates required in connexion with the reconstruction for electrical traction of further portions of the London County Council tramways, be confirmed ; and that the expenditure on capital account of the sum of 614*l.* in connexion with the matter be approved."

Rotherhithe Tunnel Rehousing.—The Housing of the Working Classes Committee reported that Winchelsea-buildings, Swan-lane, Rotherhithe, would rehouse 200 persons displaced by the construction of the Rotherhithe and Ratcliff Tunnel. The Secretary of State had now approved plans for the erection of two other blocks, to be known as Rye and Sandwich buildings, for the accommodation of a further 400 persons, at an estimated cost of 16,750*l.* A tender to do the work for 16,184*l.* had been received.

The consideration of the Committee's recommendations was deferred.

Other business was disposed of, and the Council adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage.

Woolwich.—A one-story shop on part of the forecourt of No. 46, Plumstead-road, Plumstead (Messrs. Church, Quick, & Whincop for Mr. G. C. Realff and Mr. B. H. de Bertodano).—Consent.

Norwood.† — Two additions to the Norwood Technical Institute, Knight's Hill-road, Norwood, at the corner of Chapel-road (Mr. P. L. Waterhouse for the Technical Education Board of the Council).—Refused.

Width of Way.

Islington, South.†—Retention of a dynamo shed and an oil shed on the east side of Tyndale-mews, Essex-road, Islington (Messrs. Douglas, Young, & Co. for Messrs. S. Pearson & Son, Limited).—Consent.

Hoxton.—A block of buildings on the east side of Shepherdess-walk, Hoxton, with the external walls of such buildings at less than the prescribed distance from the respective centres of the roadways of Underwood-row, Underwood-street, and Nile-street (Messrs. F. Chambers & Son for Mr. F. J. Chambers).—Refused.

Bethnal Green, South West.—A two-story warehouse building commenced to be erected on the south side of Prince's-court, Brick-lane, Bethnal Green (Mr. G. H. Lovegrove for Mr. R. Button).—Refused.

Projection and Construction of Gangway.

City.—An iron and concrete gangway across Falcon-avenue, to connect, at the first floor level, a block of warehouses known as Nos. 9, 10, and 11, Falcon-street, with No. 6, Falcon-avenue (Mr. A. E. Pridmore for Messrs. Olney, Amsden and Sons).—Consent.

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Deviations from Certified Plans.

St. George, Hanover-square.—Certain deviations from the plans certified by the District Surveyor so far as relates to the proposed conversion into bachelors' chambers of the portion above the ground floor of a building known as Hanover-buildings, Hanover-square (Mr. J. Sawyer for the Assets Realisation Company, Limited).—Consent.

Formation of Streets.

Hampstead.—That an order be issued to Mr. O. E. Winter, sanctioning the formation or laying-out of a new street for carriage traffic in continuation of Lymington-road, Finchley-road, Hampstead (for Council of the Metropolitan Borough of Hampstead). . . . That the name Lymington-road (in continuation) be approved for the new street.—Consent.

Wandsworth.—That an order be issued to Mr. F. Newman sanctioning the formation or laying-out of new streets for carriage traffic on the Streatham-lodge Estate, Streatham-high-road, Streatham, and in connexion therewith the widening of portions of Streatham-high-road, Hermitage-lane and Streatham-common-south (for Mr. C. H. C. Du-Cane). . . . . That the names Braxted-road, Baldry-gardens (in continuation), Heybridge-avenue, Fontaine-street, Welldale-street, Tiptree-street, Coulthurst-street, and Strathbrook-road, be approved for the new streets.—Agreed.

Dwelling-houses on Low-lying Land.

Greenwich.—That the solicitor do prepare a licence under section 122 of the Act, to Mr. W. Richardson, for the erection of two buildings on low-lying land situate at Bostal-lane, Abbey Wood (Mr. J. O. Cook).—Agreed.

*** *The recommendations marked † are contrary to the views of the local authorities.*

Correspondence.

RE ANCIENT LIGHTS.

SIR,—Having seen in your issue of April 5 a report of a paper read by Mr. H. Chatfeild Clarke before the Bristol Society of Architects, on "Ancient Lights," may we ask if you could spare us a little of your valuable space to add a few remarks on the same subject.

We should like to add another instance from our personal experience to those already mentioned by Mr. Clarke, to emphasise the advisability of the revision of the law, as it now stands, regarding this important matter.

We refer to the case of Parker *v.* Stanley & Co., heard before Mr. Justice Farwell, and fully reported in your issue of February 15 last, in which case we were acting as architects for the defendants.

The Judge granted a mandatory injunction to pull down to the level of the previous building, because the plaintiff, being a photographer, required *special* light. This has now been done, greatly to the detriment of the premises. The Judge, in giving judgment, said (as reported in your paper) "he thought he should have found that for *ordinary* purposes there had been no such substantial diminution of light by the new building as to have justified him in granting such an order."

The judgment appears particularly hard, as the plaintiff's premises have only been used as a photographic studio since 1890, and therefore do not constitute an ancient special light.

Surely if it takes twenty years to obtain an ordinary right of light, it should take equally as long to obtain a special right.

We venture to think this is another instance of the urgent necessity for a reform in the laws of light and air. HAYWARD & MAYNARD.

CAUDEBEC-EN-CAUX.

SIR,—As a lover of Caudebec-en-Caux, which I have twice visited, would it be too much to ask Mr. Hornblower to publish his sketch?

Any one dispensing with frequent joints will, if he live long enough, prove the truth of what is said about the wisdom of frequent jointing of stonework. E. SWINFEN HARRIS.

BATTERSEA WORKING-CLASS HOUSES COMPETITION.

SIR,—Referring to the interesting collection of drawings in the above competition, it is pleasing to note that the first premiated drawings are in pencil and are done in a most workmanlike fashion. It is to be hoped that the time has now arrived that committees will stipulate in their instructions, (although this was not the case in the Battersea competition), that only pencil drawings will be required, which, as I stated in your issue of March 1, would be a benefit to committees and competitors, thus affording more time for the competitor to submit to a committee a much better thought-out set of drawings. ARCHITECT.

BOOKS RECEIVED.

GUIDE TO EPSOM AND THE DISTRICT. By Gordon Home. (Homeland Association. 9d.)

A PRACTICAL TREATISE ON BRIDGE CONSTRUCTION. By T. Claxton Fidler, M.Inst.C.E. (Charles Griffin & Co.)

ANNUAL RECORD OF THE LONDON TOPOGRAPHICAL SOCIETY: 1900. Edited by T. Fairman Ordish, F.S.A. (Published by the Society.)

THE LONDON MASTER BUILDERS' ASSOCIATION HANDBOOK: 1902. Edited by J. W. Ritchie. (Published by the Association.)

THE TESTING ARRANGEMENTS OF THE BRITISH FIRE PREVENTION COMMITTEE. Some descriptive notes and illustrations. (C. & E. Layton.)

QUARTERLY JOURNAL OF THE SANITARY INSTITUTE. With Supplement. (E. Stanford. Journal, 2s. 6d.; Supplement, 1s.)

SURVEYING AND SURVEYING INSTRUMENTS. By G. A. T. Middleton. Second edition, revised and enlarged. (Whittaker & Co. 5s.)

ARCHITECTURAL HYGIENE: OR, SANITARY SCIENCE AS APPLIED TO BUILDINGS. Second Edition. By Banister F. Fletcher, A.R.I.B.A., and H. Phillips Fletcher, A.R.I.B.A., A.M.I.C.E. "The Builder" Students' Series. (D. Fourdrinier: *Builder* Office.)

The Student's Column.

PART II.—DRAINAGE.

CHAPTER 16.—THE DESIGN OF DRAINAGE SCHEMES.

SOME of the most important points to be observed in the design of drainage schemes have been discussed in previous chapters, and the following rules are, in the main, a recapitulation of these points in a succinct form:—

1. Intercept every main drain from the sewer by means of a water-seal trap, fixed in an intercepting chamber or (in a small scheme) at the foot of a pipe shaft, the trap to be as near the sewer as possible.

2. In large schemes, divide the drains into main and subsidiary sections, the latter being intercepted from the former; this is imperative in the case of hospitals for infectious diseases.

3. Construct manholes at all changes of direction and gradient in main drains, and at all important junctions; it is a good plan to run all branch drains to junction-chambers, instead of using pipe junctions.

4. Lay every drain from manhole to manhole in a perfectly straight line both as regards direction and gradient; in short branch-drains a certain amount of curvature cannot always be avoided.

5. Adopt self-cleansing gradients wherever possible, not exceeding 1 in 12 for 4-in. stoneware drains, 1 in 17 for 5-in., and 1 in 23 for 6-in.; for iron drains the gradients may be quicker. If the amount of fall is inadequate, give the branch drains as much fall as possible and provide flushing apparatus for the main.

6. Regulate the sizes of the pipes according to the amount of sewage they have to convey, or as nearly thereto as the local by-laws allow.

7. Disconnect all waste-pipes (except those from water-closets, slop-sinks, and urinals) and all rainwater pipes discharging into sewage-drains, by means of suitable water-seal traps, and trap all surface-water inlets to sewage-drains.

8. Reduce the number of branch-drains and traps as much as possible by discharging two or more pipes into or over each gully: two or more waste-pipes, rainwater pipes, or surface-water gullies, at a short distance from each other, may often be connected by branch-drains, (ventilated at each end) to a single trap placed in a convenient position.

9. Ventilate every main and subsidiary drainage section by means of two openings, each approximately equal in area to the cross section of the drain, one opening to be near the intercepting trap and the other at the head of the drain; a soilpipe from a water-closet, slop-sink, or urinal may be used for one of these openings, but if such a pipe is not available, a special ventilation-shaft ought to be provided.

10. Drains must not pass under buildings, except where an external course is impossible.

Many districts are now sewered on the "separate" system, that is to say, separate sewers are laid for sewage and surface-water respectively. If the Private Street Works Act, 1892, has been adopted, the Local Authority can compel a person laying out a new street to construct separate sewers, but there does not appear to be any law by which a building-owner can be compelled to lay separate drains. Few, persons, however, are willing to enter into litigation with a Local Authority, and it may be taken for granted that, where dual sewers exist, dual drains will be laid by the building-owner. The great advantage of the separate system is that the discharge of sewage proper at the outfall works is more constant, both in quantity and composition, than when surface-water is admitted to the same conduit as the sewage; the process of purification or disposal can therefore be more thoroughly and more economically carried out. This argument applies with equal force to private sewage-disposal works. Another advantage is that the sewers may be of smaller capacity, as provision has not to be made for any large amount of storm-water. The surface-water conduits do not add very materially to the cost of a sewerage scheme, as they can usually be divided into a number of small sections with different points of discharge into the watercourses of the district.

The separation of surface-water and sewage is not in any case complete. Some portion of the surface-water, such as that from areas and back yards, is usually conveyed to the sewage conduit.

In the case of an isolated building or group of buildings, the sewage from which must be purified before its discharge into a watercourse, the separate system possesses distinct advantages. If rainwater is the sole or principal source of supply for domestic purposes, the separation of some portion of the surface-water from the sewage is a necessity. In such cases the rainwater from the roofs is usually conveyed by a separate system of drains to an underground tank, from which it is pumped to a cistern in the building. Sometimes a special catch-water area is formed with cement-concrete at some distance from the building, and the rain falling on this area is conveyed to a storage tank. As a rule, however, the roof of the building is utilised for the purpose, and two sets of drains—for sewage and rainwater respectively—must be laid. Unless these conduits are carefully designed, there is a danger of a sewage-drain being connected to the rainwater-drain. In one case, which was brought to the writer's notice, the rainwater was stored in an underground tank for domestic purposes, and gradually deteriorated in quality until it was unfit for use. After careful examination, it was discovered that the drain from the water-closet had been connected to the rainwater system! This was a new house, and if a mistake of this kind can be made during construction, it can certainly be made during subsequent alterations when the positions of the two drains have been forgotten.

Special care must be taken in the design of a drainage scheme when the rain-water is stored for domestic use. The sewage drains must be absolutely watertight, so as to avoid contamination of the soil, and ought to be of cast-iron, surrounded with concrete. Manholes are absolutely necessary at all changes of direction, so that the course of the sewage drains cannot possibly be mistaken or forgotten. Rain-water drains are usually constructed of stoneware, as iron soon corrodes under the influence of soft water. They ought to be surrounded with concrete, to prevent infiltration from manured gardens, and laid at a higher level than the sewage drains. It is a good plan to lay the rain-water drains further from the building than the sewage drains, the branches to the former passing *over* the latter. Manholes, with airtight covers, ought to be provided, so that the drains can be easily inspected and cleansed. The rain-water pipes will serve as ventilators. The overflow from the tank is often connected to the sewage drain; but where this is done aerial communication must be prevented by means of a well-ventilated intercepting chamber and trap.

The next point to be considered in the design of a system of drainage is the level of the sewer or other point of discharge. The invert of a sewer can usually be ascertained by taking levels at two adjacent manholes; the distance between the manholes must be measured, and the level of any intermediate point can then be calculated arithmetically or obtained graphically by plotting the longitudinal section of the sewer. The invert of the drain must be above the invert of the sewer; as a general rule, it may be said that the junction ought to be entirely above the lowest third of the height of a pipe-sewer. This leaves the mouth of the

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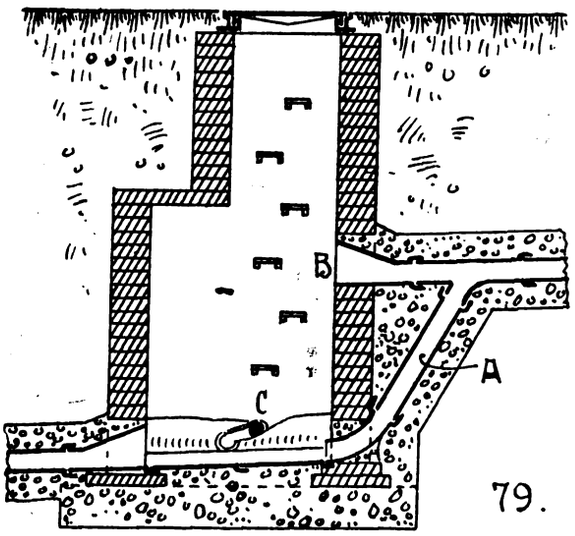

Illustration to Student's Column.

drain clear when the sewer is charged to its normal depth. If the inverts of the drain and sewer are at or near the same level, there is necessarily a certain amount of backwater in the drain, and this retards the flow and tends to produce deposits. A further disadvantage is that the drain may be entirely filled with backwater for some distance in the case of an abnormal flow in the sewer, such as may occur at certain hours of the day or during heavy rains, or as the result of sewer flushing. If, for example, a 4-in. drain with a gradient of 1 in 40 is connected to an 18-in. sewer in such a manner that the inverts at the point of junction are at the same level, the drain will be entirely filled with sewage for a distance of nearly 17 ft., when the sewer is half full, and the backwater will extend to a distance of 30 ft.; when the sewer is three-fourths full, the backwater will extend to a distance of 45 ft. up the drain, and of this length nearly 32 ft. will be fully charged. As the intercepting traps of house-drains are usually less than 25 ft. from the sewer, the sewage will, under such conditions, rise through the traps, and the drains above the traps will not only cease to be self-cleansing, but will also be charged with public sewage of a more or less dangerous character.

It follows from this that the intercepting trap ought to be placed at as high a level as possible above the invert of the adjacent sewer. The drain between the trap and the sewer will therefore often have a quicker gradient than the drains above the trap. At however low a level the sewer may be, the connexion ought not to be in the crown, as this arrangement often causes deposits, especially in branch sewers where the flow is small or intermittent.

Junctions with large brick or concrete sewers ought also to be above the level of the normal flow, and as the rise of the sewage is greater than in a pipe sewer, it is still more necessary to place the intercepting trap at as high a level as possible. Flap-valves of iron or (better) of aluminium are sometimes fitted to the ends of drains in sewers to prevent backwater, but they are not reliable, as deposits on the seating often cause the valves to remain slightly open. In Couzens's "ball trap interceptor" a copper ball floats in the trap on the drain side of the dip; the ball rises with the rise of the backwater, and ultimately seats itself against an indiarubber ring around the inlet of the trap. A fitting of this kind may be useful in low-lying districts, but should only be adopted where absolutely necessary.

If the difference in level between the head of the drain and the sewer is small, the junction may, with advantage, be placed at a point near that boundary of the site where the sewer is lowest. A sewer with a gradient of 1 in 200 falls 6 in. in a frontage of 100 ft., and these 6 in. may make a great difference in the efficiency of the drains.

In designing a system of drainage careful levels must be taken, not only of the sewer-invert, but also of the ground through which the drains must pass and (in the case of existing buildings) of the ground floor and basement floor and of all inlets. An accurate plan of the property must also be prepared to a sufficiently large scale, so that every gully, trap, manhole, and other accessory can be clearly shown. It is a great mistake to attempt to delineate a drainage scheme on a block-plan only, drawn to a scale of 30 ft. or 40 ft. to an inch. The drains are as important as any part of a building, and those in the immediate vicinity of a building ought to be drawn to the same scale, namely, 8 ft. to an inch. Long outfall drains may, of course, be shown on a smaller block plan.

The most direct course which circumstances will allow must be adopted from the head of the drain to the junction with the sewer. Circuitous routes are more costly and more difficult to ventilate, and in many cases necessitate smaller gradients and increased risk of deposits, which in turn involve fouler air in the drains. The fall from the lowest inlet to the sewer must then be ascertained from the levels, and if this is very small the drain between these points must be designed with uniform gradient throughout. If the fall is ample, different gradients may be adopted; (1) a quick gradient for the drain from the inlet to the junction-chamber; (2) a slower but self-cleansing gradient for that from the junction-chamber to the intercepting-chamber; and (3) a quick gradient for that from the intercepting-chamber to the sewer. Allowance must be made, wherever the fall will permit, for a drop from the branch to the main drain equal to half the diameter of the latter, and for a drop of 3 in. or more into the intercepting-trap. The depth from the surface of the ground to the invert of the gully outlet must, of course, be taken into consideration. This varies according to the type of the gully; for an ordinary 4-in. P trap it is about 7 in.

The gradient from the head of the drain to the junction-chamber receiving the drain from the lowest inlet can now be settled. If the lowest inlet is from the basement at the front of building, and if the other inlets are at or near the surface of the ground, a self-cleansing gradient can be given to the main drain from these inlets to the junction-chamber, and the connexion with the latter formed as shown in fig. 79. The sewage from the high-level drain enters the chamber through the pipes at A; a pipe or chute is fixed at B, so that the upper drain can be inspected and cleared in case of stoppage. The low-level inlet is shown at C. If the pipes at A are omitted, the sewage from the upper drain causes a great amount of splashing in the manhole, and the benchings and walls become coated with deposits which decompose and often cause a serious nuisance. A similar arrangement can be adopted at a lamphole. To inspect the lower drain, the lamp must be lowered to the bottom of the shaft and observed from the intercepting-chamber or nearest manhole below this point; to inspect the upper drain, the lamp must be lowered to the level of the pipe B, and observed from the next manhole above this point.

OBITUARY.

MR. THOMAS OLIVER.—We regret to announce the death on the 24th ult., in his seventy-eighth year, of Mr. Thomas Oliver, architect, of Newcastle-on-Tyne. Mr. Oliver was senior partner of the firm of Messrs. Oliver & Leeson, latterly Messrs. Oliver, Leeson, & Wood, of Bank-chambers, No. 30, Mosley-street, Newcastle-on-Tyne, and was elected a Fellow of the Royal Institute of British Architects in 1866. Of the more important of the architectural works carried out by the firm of Oliver & Leeson we may mention the following:—St. Barnabas Church, Dulwich (ten years ago); alterations, with new entrances and other improvements, of the Tyne Theatre, Newcastle; the Training College, Norwich (for which Ewan Christian acted as assessor), illustrated in the *Builder*, November 19, 1892; restoration of the tower and spire, St. Nicholas Cathedral, Newcastle, in 1896; laundries at Low Fell, co. Durham, for the Provincial Laundries Co., Ltd.; additions, with improvements, to ninety-two houses at Felling, Durham; the High School for Girls at Jesmond, for the Corporation of Newcastle; the new Technical College at Durham, since named the Johnston Institute of Science and Art, constructed in three stories of red brick, with a red tiled roof, and a main entrance in South-street of stone, and on the east side overlooking the wooded banks of the Wear, begun in July, 1899, and opened on May 22 last year (Messrs. Oliver, Leeson, & Wood); school buildings in Chester-road, Bishopswearmouth, for the Sunderland School Board, 1893-4; the car depôt and other works at Walker-on-Tyne, for the Newcastle City Tramways undertaking; cottage homes for pauper children at Ponteland, for the Newcastle Guardians (Messrs. Oliver, Leeson & Wood); and the Olympia Hall, Northumberland-road, Newcastle, constructed of corrugated iron lined with wood, with an iron-framed ceiling and a highly ornamented façade executed in plaster-work after the Italian manner, having a capacity for about 3,500 persons, and opened on December 2, 1893, for which the plans and designs were prepared by Messrs. Oliver & Leeson and Mr. T. R. Milburn, of Sunderland, as joint architects. Amongst other works for which the firm were employed as architects are, in Newcastle-on-Tyne, the Clarendon Temperance Hotel; the block of office buildings at the top of Dean-street, and in St. Nicholas churchyard; the Nurses' Home at the Fleming Memorial Hospital, opened three years ago, and the Co-operative Stores, both by Messrs. Oliver, Leeson, & Wood, who in May, 1900, were appointed architects for the re-building of the Ord Arms at Scotswood; in Gateshead—schools to accommodate 880 children, with a large gymnasium, cookery classrooms, a manual-instruction room, &c., at Kell's-lane, in the Low Fell district, for the School Board; the Parish Hall for the Venerable Bede Church, Sunderland-road; a church institute for St. Paul's, in the Low Teams; and the enlargement of the board schools in Durham-road (Messrs. Oliver, Leeson, & Wood); also the enlargement, recently begun, of schools at Westmoor and in the vicinity for the Long Benton School Board. In our issue of October 8, 1898, containing "Newcastle-upon-Tyne," No. xviii. of our series, "The Architecture of Our Large Provincial Towns," we illustrated Messrs. Oliver & Leeson's measured drawings of the spire of St. Nicholas, with their designs for the Co-operative Wholesale Society's new offices, warehouses, and Conference Hall, in Blandford-street, and for two blocks of business premises in Collingwood-street. On April 27, 1889, we illustrated the plans and designs for which the second premium had been awarded to them in the competition for the Friars' School at Bangor; in January, 1889, the firm were invited to send in competitive designs for the new infirmary buildings at Newcastle, in respect of which competition Mr. Alfred Waterhouse, R.A., was appointed the assessor. They themselves were nominated to act in that capacity, in 1899, for the Burnley Higher Grade Schools competition. From the *Newcastle Daily Chronicle* we learn that Mr. Oliver was the first Secretary to the Northern Architectural Association, founded in 1858, and that he retained that office until 1870, when he was elected President. In 1872 he took up the duties of Secretary again, and in 1877 was again elected President for three years. Mr. Oliver entered into partnership with Mr. Leeson in 1879. He died at his private residence, Ennerdale, Jesmond.

GENERAL BUILDING NEWS.

RESTORATION OF OLD BASFORD CHURCH, NOTTINGHAM.—The restoration of the parish church of St. Leodegarius, Old Basford, has now been completed. The foundation of the church goes back to the twelfth century, the founder being Sir William de Basford, the grandson of a retainer of William the Conqueror. But little remains of the thirteenth century edifice, the chancel, which was almost entirely demolished by fire a couple of years ago, being the oldest part of the fabric remaining. The church has had an unfortunate history within modern times. The tower collapsed about forty years ago, carrying with it the western bay of the nave arcade, and the neglect and vandalism of the latter part of the eighteenth century caused much of the architectural beauty of the church to be sadly impaired. Happily, the church has reaped the benefit, ere it was too late, of the growing appreciation of antiquities, and its later restorations have been conceived in reverence and artistic insight. The tower was rebuilt out of the old material, so far as it would go, in imitation of the graceful form of the fifteenth century, and other works of renovation were carried out from time to time as necessity dictated. But these were not of a sufficiently far-reaching character to assure the preservation of the church intact, and the attention of the Duke of Newcastle was drawn to the condition of the fabric. It was decided, in the first place, at once to arrest the decay brought about through damp and other causes, and this done, to make improvements in the general condition of the church, such as the addition of a rood screen, a new reredos, panelling around walls, &c. The first portion of the scheme had only just been completed when this work, together with a great portion of the entire building, was destroyed by fire in November, 1900, thus necessitating the restoration of the roofs, the re-building of the chancel arch and a portion of the nave arcade, together with other parts destroyed. Advantage was now taken to make further improvements. The roof as newly constructed improves the general effect and acoustic properties of the building. The reconstruction of the arcade and

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chancel arch has been carried out in accordance with the old work, similar stone to that previously used having been secured. New stained glass windows, replacing those destroyed, have been supplied, and are from the studio of Mr. E. J. Prest, London. The subjects are similar to those in the windows destroyed. The new organ is from the works of Messrs. Henry Jones & Son, London. The case designed by the architect is in harmony with the rest of the woodwork in the church. Not the least of the improvements is a new vestry, of which, before the fire, the church was devoid. The flooring is entirely new, being composed of a 6-in. bed of concrete over the whole area, covered with wood blocks, and having stone aisles. The decorations generally have been supplied by Miss Beatrice Cameron, of London. The period of design chosen for the wood fittings generally is that of the fifteenth century. A new cover for the font has been carved. All the work of restoration has been carried out under the direction of Mr. W. H. Thompson, the Duke of Newcastle's architect, the contractors being Messrs. George Hopewell & Son, of Basford.—*Nottingham Guardian.*

WESLEYAN CHAPEL FOR BRADLEY.—The foundation-stone has just been laid at Bradley of a new Wesleyan chapel. The estimated cost of the new edifice is 4,600*l.* The building, which is in the Gothic style, will accommodate, when finished, 620 persons. The architect is Mr. C. W. D. Joynson (Wednesbury), and the builder Mr. W. G. Lees (Darlaston).

RESTORATION OF PAISLEY ABBEY.—A dedication service was held in Paisley Abbey, on the 24th ult., in connexion with the formal reopening of the church on the completion of the first stage in the Abbey restoration scheme. The general scheme provides for the restoration of the choir, the transepts, and the central tower, and in the meantime the first section of the tower and the transepts have been finished, whilst the old St. Mirin Chapel or sounding aisle has been opened up, and a temporary organ chamber has been placed at the entrance to the choir. It has been the aim of the architect, Dr. Rowand Anderson, of Edinburgh (says the *Glasgow Herald*), to have the restoration work so carried out as to be in unison with the existing nave and the old ruined portion of the edifice. The transepts, of which but a ruined gable was all that had remained, have been admirably restored and brought within the church proper, and an excellent harmony has been attained in their junction with the nave. An impressive appearance has also been given to the transepts by the stained-glass windows which have been placed in them. There are three of these windows. The restoring of the first section of the central tower has been a work of great magnitude. Every precaution has been taken to make the foundations thoroughly secure. Then the tower rises from four massive piers connecting the choir and the nave, and the first section, 40 ft. square, has been carried several feet above the roof of the main building. Owing to the formation of the tower piers, four arches have been formed between the pillars, the ceilings being groined, whilst the ceilings of the connecting transepts are of carved woodwork. By the restoring of the transepts additional space has been obtained in the nave, and the sitting accommodation of the church has been altogether increased by about 400. Advantage has been taken of the improvements to introduce the electric light into the edifice; but the new pulpit, communion table, chairs, and lectern were not ready in time for the opening ceremony. The work so far completed has been in progress during the past three years, and has cost fully 20,000*l.*

PENN CHURCH, BUCKS.—The question of the restoration of the tower and roof of the ancient parish church at Penn, in Bucks, engaged the attention of a vestry meeting recently. A report was received from Mr. S. Stallwood, Diocesan Surveyor, which showed that a sum of 500*l.* was necessary so far as the roof was concerned, and an additional expenditure of 300*l.* was needed to repair the tower. An estimate had previously been obtained from a local contractor for the repair of the roof only at 90*l.*, and as there was such a wide difference in the figures the vestry decided to call in a third opinion before applying for a faculty.

NEW BUILDINGS IN ABERDEEN.—The Plans Committee of Aberdeen Town Council report having sanctioned the following plans:—Dwelling-house on the west side of Fonthill-terrace, for Mr. Edmund Barrie, per Messrs. Sutherland & Pirie, architects; three dwelling-houses on the north side of Great Western-road, for Messrs. Storie, Cruden, & Co., per Messrs. Cameron & Watt, architects; dwelling-house on the north side of Hammerfield-avenue, for Mr. William Walker, per Mr. James Watt, architect; dwelling-house on the west side of Roslin-street, for Mr. John Reid, per Mr. William Smith, architect; two dwelling-houses on the north side of Carlton-place, for Mr. T. W. Hector, per Mr. George Anderson, architect; warehouse on the east side of Russell-road, for Messrs. Barclay, Ross, & Tough; four dwelling-houses on the north-east side of Forest-avenue, for Mr. J. D. Mackie, per Messrs. W. Henderson & Son, architects; three dwelling-houses on the north side of Devonshire-road, for Mr. James Dey, per Mr. John Milne, architect.

SUNDAY SCHOOLS, EAST TEIGNMOUTH.—New Sunday schools are being erected adjacent to St. Michael's Parish Church. The architects are Messrs. J. W. Rowell & Sons, of Newton Abbot, and Mr. E. Andrews, of Teignmouth, is the builder. The building is to be 60 ft. by 34 ft. The classroom will be 24 ft. by 14 ft., and the retiring-room and lavatories 10 ft. by 8 ft. The building can be entered by the porch through the class-room. It is to be of red brick, with dressings of white brick and Beer stone. The roof will be partly open-timbered, and the internal woodwork all stained and varnished. It is proposed to heat the building by hot water on the high-pressure system of Messrs. Longbottom & Co., of Leeds. The schools are to cost from 1,500*l.* to 1,600*l.*

BRECHIN CATHEDRAL.—Brechin Cathedral has just been reopened after restoration. Mr. Honeyman, R.S.A., of Messrs. Honeyman & Keppie Glasgow, has acted as architect. The last service in the old church, as it then was, was held about the middle of January, 1900, and the dismantling of the edifice was forthwith commenced. The chancel, which had stood partly in ruins for centuries, was put right, the part awanting being rebuilt in accordance with the style of those parts remaining. The chancel arch was opened out and shown as it was in centuries gone by, the galleries were removed, and the notched columns inserted and the plaster removed. The aisle walls have been rebuilt of the proper height, and the roof carried up to the proper position, thus once more laying open the clerestory windows and cornice, while the whole was roofed in — both aisles and nave — with an open roof of pitch pine, while a small gallery has been erected at the west end, on which has been rebuilt the organ on a modern principle. The organ loft and choir gallery is of unstained oak, while the pews in the area of the church are of pitch pine; the seats of the chancel being of a more ornate design, and constructed of oak, of which material is also the roof of the chancel. Consequent on the removal of the galleries and the renewing of the pews generally, the seating accommodation was greatly reduced, and in order to compensate tor this to some extent, the architect erected an additional aisle on the north side, in the position where the north transept should be. This will accommodate about 120 sitters. It is an entire addition and departure from the original church, and in order to show and accentuate this, the style is entirely different, being of a later date. A south transept has also been added for increased sittings, the style being also Decorated Gothic, as distinct from the Early English of the original portions of the cathedral. The whole of the floor of the nave and aisles has been laid with pitch-pine blocks, embedded in pitch on a sub-bed of concrete, which will ensure comfort and freedom from damp. The open area of the chancel, as well as the space in the end where the high altar stood, but now occupied by the communion-table, are floored with mosaic work, and the body of the church is heated by a hot-air system, while the whole building is lighted with electricity. A north porch has been erected of ashlar, in the same position as the ancient porch had stood; in fact, in digging for the foundation, the workmen came upon the foundation of the ancient structure. This porch will form the principal entrance to the church, the others being by the north aisle, south transept, and great west door. The organ has been entirely re-cased; an oak pulpit and lectern, in keeping with the style of the church, has been erected; and a baptismal font of Corrennie granite has been placed in the building. The whole of the chancel windows have been filled in with stained glass. The east window of the south aisle and the east window of the north aisle have been filled with stained glass. The rest of the windows are in cathedral glass. The whole of the contracts have been carried out by the following, under Mr. Charles Grant as clerk of works:—Mason, J. H. Whyte & Sons, Glasgow; woodwork, Hutcheson & Grant, Glasgow; glazier, J. Meikle & Son, Glasgow; slater, John Davidson, Brechin; plumber, Geo. Cuthbert, Brechin; painter, J. C. Middleton, Brechin; heating, John Grundy & Co., London; electric fittings, Lowson & Son, Dundee; organ, J. R. Millar, Dundee.—*Aberdeen Journal.*

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. Albert Hildesheimer, fine-art publisher and colour-printer, has removed to new offices and warehouses at 33 and 34, Shoe-lane, E.C., his old premises in New Zealand-avenue having been destroyed in the recent fire in the Barbican.——Mr. Edward Dodd, civil engineer, of 37, Waterloo-street, Birmingham, has taken his brother, Mr. R Parker Dodd, into partnership, and the firm will practise under the style of Messrs. Dodd & Dodd, civil engineers, at the above address.——The Builders' Benevolent Institution have removed their offices to 31 and 32, Bedford-street, Strand, W.C.——Mr. H. W. Rising, architect and surveyor, of 30, Great James-street, Bedford-row, has dissolved partnership with Mr. Shoebridge, and will henceforth carry on his practice at the above address under the style of H. Whiteman Rising.

PENZANCE WATER SUPPLY.—At Penzance, on the 22nd ult., Mr. M. K. North, M.Inst.C.E., Local Government Board Inspector, held an inquiry into the application of the Corporation for permission to borrow 6,000*l.* for waterworks, 1,000*l.* for public walks and pleasure grounds, 360*l.* for purposes of street improvements, 300*l.* for the provision of a disinfecting apparatus, and a building to contain the same on the hospital site in St. Just-road, and 540*l.* for a landing stage. Mr. F. Latham is the Borough Surveyor.

A CORRECTION.—In our Note on the James Forrest lecture, p. 414 *ante*, the mistake "entectic" escaped notice. It should, of course, have been "eutectic."

CHANCEL SCREEN, LONGSTOCK CHURCH, HANTS.—A chancel screen of carved Hampshire-grown oak has just been placed in Longstock Church. Resting upon the chancel step, the new screen is divided into five distinct compartments, the central one forming the actual approach to the chancel. This is gabled, the gable rising through and above the cresting and carved cornice, and terminating with a large cross. Each bay is gabled, the latter in their turn crocketed and cusped, having pinnacles dividing each respective bay. The work has been carried out by Messrs. H. Hems & Sons from the designs of the late William White, F.S.A., the architect of the church.

THE HOMELAND ASSOCIATION.—We have several times reviewed the charming little books on local scenery and objects of interest published by the Homeland Association. We are pleased to record that on their sending to the King a copy of their book on the Scilly Islands, after his recent visit, his Majesty has not only accepted it, but has expressed his wish to receive all further "Homeland Handbooks" to be issued by the Association. It seems very fitting that the Sovereign should thus encourage an Association which is promoting a better acquaintance with the beauties of our own country

HOW TO CORRECT PROOFS.—Messrs Blades East & Blades, printers, send us a small pamphlet under the above title, in which the accepted methods of correcting every kind of mistake on a proof are illustrated by facsimile examples. It would be very useful to many persons who do not know how to correct proofs in such a manner as to be immediately intelligible to the printer.

MUNICIPAL AND ALLIED FOREMEN'S INSTITUTE.—This Institute has been founded for supervisors, clerks of works, inspectors, and foremen engaged in municipal work in the following branches: Masons, paviors, sewermen, tramway layers, gas, water, electric light, dusting and slopping, and any other branch of municipal work. Each candidate must have been, at the time of election, for a period of at least twelve months a supervisor, clerk of works, or foreman of men, and in the receipt of not less than 2*l.* per week. At the last meeting more than thirty new members were enrolled, bringing the total up to 150. We understand that it now includes most of the leading municipal and contractors' foremen in London, whilst the society's objects—principally those of mutual help—have also appealed to road and other foremen in the provinces, many of whom have now joined the Institute. It is intended to approach the chief surveyors of the metropolis with a view to their becoming honorary vice-presidents. Mr. D. E. Walsh, of 90, Lenthall-road, Dalston, is the secretary.

CEMENT IN THE UNITED STATES.—The reports for the year 1901 just received by the Foreign Office from Mr. Wyndham, British Consul at Chicago, and from the Vice-Consuls at St. Louis, Kansas City, Omaha, and Denver City, all contain references to the cement trade. Mr. Consul Wyndham's report is, as might be expected, by far the most exhaustive, and his view of the subject may be said to cover, in some respects, the whole of the United States. It is therefore worthy of being quoted from at some length. Very little imported cement (observes the Consul) "is now used in Chicago and the surrounding country, although occasionally a contract calls for British Portland cement, when it has to be ordered specially. The import duty is 6d. per 100 lbs. The supply of cement manufactured in the neighbouring States is very large, and is still increasing. Much of the cement used in Chicago comes from Michigan and Indiana, but there are in this consular district cement works in Illinois, Kansas, and Colorado, not to mention two that are building in Missouri. Besides these, the Illinois Steel Works manufacture cement made of specially selected slag from the blast furnace. This is roasted, put into the open air to free itself of lime, ground to a very fine powder, and mixed with the necessary chemicals. Great care has to be taken in the burning or roasting, and a cement that is claimed to be as good as any made is produced and is sold delivered in Chicago for about 5s. 6d., in barrels or sacks, per 380 lbs. net. Pennsylvania and New York works supply the Eastern demand at 3s. 6d. to 4s. per barrel at the mills. Kansas, Michigan, Indiana, and Illinois mills supply the central part of the States, charging 4s. 4d. to 4s. 9d. at the mill, while the Colorado mills get higher prices owing to the distance from other works and the cost of freight; these prices do not include barrels, for which a charge of 1s. 3d. is made, but if the 380 lbs. net of cement is put in bags no extra charge is made provided the sacks are returned. The United States' Geological Survey reports that a mixture of 100 parts cement rock, showing 69·24 per cent. carbonate of lime, and 42·8 parts of limestone, having 40·38 per cent. carbonate, making 76·7 per cent. carbonate, is most satisfactory. To obtain this very fine grinding it is necessary to make the

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percentage of insoluble matter as low as possible. In 1899 the product of Portland cement manufactured from marl and limestone was 3,711,220 barrels roasted in rotary and 1,941,036 barrels in vertical kilns. Much expense is saved by the rotary kiln. Natural rock cement production by seventy-six works was 9,808,179 barrels, valued at 2s. per barrel. The annual consumption in the United States is estimated at over 17,000,000 barrels, of which 8,000,000 barrels are Portland, 2,000,000 barrels of the latter being imported. That was in 1899, but in 1901 imports fell off one-half. Two brands of imported cement — one Belgian and the other German—are used to some extent, and fetch from 11s. 4d. to 16s. 6d. per barrel. These cements are made from slag, and are known as non-staining cement, being free from oxide of iron. The American cement is ground as fine as flour, and it is said that the coarse grinding of British cement is a great obstacle to its sale, even if prices were the same. In some buildings which are being made with cement, a wire netting erection is put up first and the cement laid round it. This is said to increase the strength of the building 100 per cent. A machine for turning out blocks of cement for building purposes has been worked lately in a town near Chicago. These blocks are made hollow and plain or ornamented as required." Mr. Wyndham adds, incidentally, that great deposits of gypsum, which are shipped to Chicago from Michigan for plastering houses, are now being worked, and enormous quantities, mixed with old rope, will probably be used in 1902 for the exhibition buildings in St. Louis. Mr. Western Bascome, Vice-Consul at the latter place, remarks that "Portland cement used to be dealt in largely ten to fifteen years ago, but the increased production of American manufacturers has cheapened it so that it will not bear the duty and heavy transportation charges. It sells retail at from 6s. to 7s. per barrel, and manufacturers cannot lay it down here at a profit. If it could be laid down at a profit under the retail prices quoted a good business might be done in it whilst the buildings of the World's Fair and the necessary walks are being made, but the American output is increasing so largely that I do not think the business would be permanent. A large plant now building in this city will soon be in operation." The Vice-Consul at Kansas (Mr Young) agrees that Portland cement does not make a satisfactory return, and that for some years there has been a falling off in the importation, but he adds, somewhat paradoxically, "It would seem that this trade might be well pushed." The laconic comment of the Vice-Consul at Omaha is that "English Portland cement is not saleable, because the price is too high; the American article appears to satisfy requirements as to quality, and is considerably lower in price." Mr. Vice-Consul Pearce, of Denver, writes: "The consumption of Portland cement in the State during the past year was about 200,000 barrels, and not over 10,000 barrels of this quantity was imported, only a small portion of the imported being from the United Kingdom. A cement factory was erected in the State early in the year, and this factory, with one in the adjoining State of Kansas, has supplied the Colorado demand. It is stated that the home-manufactured product is nearly equal in quality to the imported. The prices are, for the imported, 3 dols. 25 c. (13s. 9d.) per barrel, and for the domestic, 2 dols. 25 c. (9s. 3d.) per barrel."

SCOTTISH BUILDING TRADES FEDERATION.—The half-yearly meeting of the Scottish Building Trades Federation was held in the Station Hotel, Perth, on the 25th ult. Mr. Robert Lamb, builder, Edinburgh, the President, occupied the chair. Members were present from various parts of the country, including Glasgow, Edinburgh, Dundee, Aberdeen, Perth, Stirling, Kilmarnock, Inverness, Coatbridge, &c. The secretary (Mr. Jas. L. Selkirk, Glasgow) submitted the report, which detailed the work being carried on by the executive during the past six months. The various subjects referred to therein were severally considered and discussed, and a number of resolutions were come to in regard to future operations. These have reference to organisation, trade disputes, making by-laws, conditions of contracts, builders' journal, finance, &c. A resolution was arrived at to render the Federation a still more efficient and serviceable instrument for the promotion of the various bodies for the furtherance of which it was instituted. A national deputation from the National Association of Building Trades Employers of Great Britain and Ireland attended and addressed the meeting in encouraging terms. The terms of the report, so far as it refers to trade disputes, are as follows:—The somewhat depressed conditions of trade generally, and of the building trade in particular, during the past year or two, accounts for the general absence of trade disputes. Where the operatives have felt they were in a position to maintain their ground they have done so successfully. Where the circumstances were otherwise they have been ready to confer and arbitrate, and in doing so they must have felt that their interests were perfectly safe. The old difficulty still, unhappily, prevails. The operatives for the most part insist on an annual agreement being entered into at a period of the year which is most suitable for them, but very unsuitable for the employers. This largely explains why the standard rate of wages is often maintained above the normal condition though work may be slack, because the rate was fixed at a period when the employers were practically helpless. The unfairness of such a state of matters must be as obvious to the operatives as to the employers, but it is meantime allowed to continue because organisation is not so complete on the one side as on the other. The day cannot surely be far distant when this great anomaly will come to an end.

A PIECE OF AMATEUR BUILDING.—The members of the South London Methodist Church in Paradise-road, Clapham, have been doing a spirited piece of work in building their own Church House by the labour of their own members, merely purchasing the materials. Nothing was paid for labour, which was all voluntary. A retired bricklayers' foreman drew the plans, an engineer of the congregation laid the drains, and the treasurer did the bricklayer. A well-known architect, who went to see it, testifies that it is very good and solid work.

CHURCH OF THE HOLY INNOCENTS, HAMMERSMITH.—A carved walnut triptych has just been erected in the Lady Chapel of this church. The side wings contain bas-relief statues of St. Claire and St. Helen. The centre panel is a painting in oils depicting the adoration of the Magi and Shepherds, with raised gesso backgrounds. The work was executed by Messrs. Taylor & Clifton, of London, W., from designs of the Rev. Ernest Geldart.

MAIDSTONE BUILDING TRADES' ASSOCIATION.—The members of this Association dined together recently at the Bull Hotel, under the chairmanship of Mr. R. Avard (President of the Association), Mr. W. F. Wallis (Vice-President) facing him at the other end of the table. The toast of "The King and the Rest of the Royal Family" having been loyally honoured, the Chairman proposed "The Imperial Forces," coupled with the name of Major Oliver, who replied. Mr. West then proposed "Success to the Maidstone Building Trades' Association." He thought they had everything in their favour at Maidstone for forming an organising centre for the South-Eastern District Federation. Their Vice-President (Mr. Wallis) was one of the most active members of the trade in promoting that movement. They had reason to congratulate themselves upon the very successful issue to which they brought the dispute over the question of hours in several trades last winter. They at Chatham followed the trend of that dispute very carefully because in a measure they were labouring under the same difficulty in the winter. The step taken at Maidstone was one in the right direction, and he had given notice to the Chatham Association that he would propose the adoption of the same rules for that district.—Mr. Wallis, in reply, said he had always taken a deep interest in the Association. He recognised that they were not so well organised as the workmen, and they had the architects also with their well-organised Institute. The workmen's organisation was exceedingly well managed, and they had enormous funds and knew how to use them. Although they (the builders) were organised locally and had carried their point with a certain amount of success, they wanted to be fully respected by the men, and therefore should form a larger organisation, and with this view he went somewhat strongly into the idea of the federation of the Southern Counties. He was sorry it had not been taken up generally with the enthusiasm it deserved. The workmen's union, however, only had small beginnings, and he was not without hope that their own Federation would in time develop into proportions that would command the respect of both sides. The great stumbling-block was the question of finance. The workman, very much more alive to his interests than the employer, put by a considerable percentage of his earnings, placing them in the hands of his society, and the builders ought to make up their minds to do something similar, and consider it as an insurance fund. If they put by a corresponding amount to their insurance, they would have greater freedom from trade disputes. Apart from the men, the Federation would give them a better status with the architects and surveyors in dealing with the forms of contract they were sometimes called upon to sign. The speaker suggested the formation of an association amongst the towns in the centre of Kent on similar lines to the association for the insurance of the employer against accidents to the workmen, with a reserve fund to deal with disputes.—Subsequently, the toast of "The Architects and Surveyors of Maidstone" was proposed by Mr. Wallis. Mr. Smith, in reply, said he believed the building trade stood at present on a higher level than ever it did. It had often been remarked that they could not put up buildings nowadays such as the ancients did. He did not agree with people who said so, but he believed in the fact that the fittest had survived. They had with them now examples of true and honest work, but those examples were few and far between. What had become of the ordinary buildings of past centuries? They had gone with the centuries. The ordinary dwellings of the people, the work that was put up to serve the purpose of the time, had gone, and the monumental buildings alone remained. He believed the percentage that would remain after their day would be far greater than the percentage of buildings which had survived past ages. There was work they would not like to last as examples of what was done at the end of the nineteenth and beginning of the twentieth centuries; but there was good honest work that would compare with any in the world, and it was upon that they would pledge their reputation.—For "The Town and Trade of Maidstone," proposed by Mr. Cox, Mr. E. Vaughan replied.—Mr. R. Corben proposed "The Visitors," and Mr. B Smythe responded.

HOUSING CONFERENCE AT NEWCASTLE-ON-TYNE.—A conference to consider the question of housing reform was held on Saturday last week in Newcastle-on-Tyne, under the auspices of the northern section of the Co-operative Union, the National Housing Reform Council, and the Durham and Northumberland Land and Labour Committees. Representatives were present from these two bodies and from local authorities and trades' councils in the two counties. The Mayor of Newcastle (Mr. H. W. Newton) presided, and explained the local endeavours which had been made to deal with the problem. Some years ago the Corporation prepared a scheme of single tenements at the east end, where people lived who were making from 16s. to 18s. a week. They wanted to provide these people with a room at a rent of from 2s. to 2s. 6d. a week, and proposed a scheme which provided a large room, partitioned off, with plenty of room for ventilation. But the Local Government Board objected to the scheme on the ground of public morality. The Council now proposed to erect buildings of one and two rooms in the centre of the city, the rent being 2s. 6d. for one room and 4s. for two rooms. In seconding a resolution in favour of municipal garden cities and increased powers of purchase of land, Dean Kitchin said that the one question at the base of the matter was the abominable condition of the Land Laws of England. The real difficulty was to get the whole of the land in such a way as would enable them to make a proper use of it for the good of the people. One of the worst things that had happened in the counties of Northumberland and Durham was that among the miners the houses had not been built in a more attractive manner. He did not think they would be able to do very much in existing towns in the way of improvement, because of the manner in which the value of ground had risen in recent years, enabling the landlords to fill their pockets at the expense of the hard work of the men in the neighbourhood. The tendency of towns was to produce a second-rate type of men and women. The only remedy was to get the men and women away from the towns and put them in decent houses in healthy surroundings.

CAPITAL AND LABOUR.

LEEDS BUILDING TRADE RULES.—Amended rules have come into operation in two branches of the Leeds building trade. Short time is to commence in future eight weeks before and finish six weeks after Christmas. On the question of overtime, the masters proposed that the rule should read:—"That all overtime after the first two hours and Bank Holidays be paid for at the rate of time and a half, and double time for Sundays and Christmas Days." The men, however, are to have time and a quarter for the first two hours. The remainder of the rule stands.—*Leeds Daily News.*

LEGAL.

A BRICKLAYERS' LABOURER'S ACTION FOR PERSONAL INJURY.

THE case of Purvis *v.* the Newcastle-on-Tyne Co-operative Society came before the Court of Appeal, composed of Lords Justices Vaughan Williams, Romer, and Mathew, on the 29th and 30th ult., on the application of the plaintiff for judgment or new trial on appeal from a verdict and judgment at trial before Mr. Justice Lawrance and a jury at Newcastle-on-Tyne in February last.

In this case the plaintiff, William Purvis, a bricklayers' labourer, sued the defendants for damages for personal injury caused by the negligence of the defendants' servants. The defendants denied liability and urged contributory negligence on the part of the plaintiff.

It appeared from the statement of Mr. Scott-Fox, K.C. (with him Mr. Meynell), for the appellant, that at about 9.30 on the morning of June 24, 1901, the plaintiff, who was about forty-two years of age, was in Darn Crook, Newcastle-on-Tyne, where the defendant society were erecting new premises. Standing outside those premises was a cart belonging to the defendants, which contained stones. With this cart was a man named McNally, who was a member of the Union of which the plaintiff was a delegate, and to whom the plaintiff wanted to speak. The stones in the cart were being pulled up to the top of the building by means of a crane and a single chain. McNally sent up a load of the stones, and turned to talk to the plaintiff. Suddenly one of the stones fell, and came down in two pieces. One half nearly killed McNally, and the other half struck the plaintiff, inflicting serious scalp wounds, a broken hip bone, paralysis of the right side, and other injuries which would probably incapacitate him from work for the rest of his life. The plaintiff's case was that the accident occurred through the negligence of the defendants in not sending up the stones in a double sling or in an ordinary wooden

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carrier. The defendants denied negligence in the matter, and at the trial called evidence to prove that before the stones were hoisted warning was given. The jury returned a verdict for the defendants. The learned counsel said it might be taken that the jury by their verdict found that the plaintiff had been guilty of contributory negligence. He submitted that there was no evidence before the jury to justify them in finding that the plaintiff had been guilty of any negligence at all. Practically the only issue for the jury was whether the defendants were guilty of negligence, and his contention was that they were.

Without calling upon counsel for the respondents their Lordships came to the conclusion that the learned Judge had not misdirected the jury, and that there was evidence to go before the jury that the plaintiff had been guilty of contributory negligence. The appeal was accordingly dismissed.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

22.—BRICKMOULDING MACHINERY: *L. Ingham and B. Langton.*—An extension machine for moulding radial, tapered, and other bricks has the side-plates of the mouthpiece set upon pivots so that they shall turn outwards as the brick is being moulded, and the plates are held in place with side-rollers that are moved in slotted guides with slotted levers which are pivoted on to a crossbar. At the sides of the cylinder are slotted brackets, on to which are bolted the guiding-bars, that have slots to take studs or bolts upon the outer ends of the levers. The face of a die or abutment-block is curved, bevelled, or straightened as may be required. A knife which is hinged to a bar pivoted to a slotted bar in front of the cross-bar cuts off the brick at the mouthpiece; and a piston, worked with a screw, toothed wheels, and endless bands, feeds clay into a cylinder.

32.—A GUARD FOR WOOD-WORKING MACHINES: *A. Cook.*—A guard for the cutter of a planing or moulding machine, having a vertical spindle, consists of a cylinder fashioned in two halves, whereof the one is to be turned out of the way by turning it against the action of a spiral spring mounted upon a vertical axis at the end of a radial arm, whilst the other half is similarly turned upon a horizontal axis upon the radial arm. A rod, an arm, and the radial arm join the guard adjustably to the standard to which the latter arm may be fastened with a bolt and a slotted quadrant. Confer also Nos. 1,375 of 1899, and 14,496 of 1900.

59.—A GUARD FOR CIRCULAR SAWS, WOOD-PLANING MACHINES, &c.: *T. Lees, R. Lees, and W. Lees.*—The guard plate, which in the case of a circular saw may consist of two parts, is carried at the end of a radial arm which is pivoted on to the horizontal arm of the standard. The wood is pressed in its advance against a wheel upon the radial arm so as to lift the guard-plate from the revolving cutters. The guard will resume its former position when the wood has been passed forwards.

72.—A STREET-CLEANING MACHINE.—*R. C. Menzies.*—The frame sustains a receiver which is joined with clips to the curved wheel axle and shafts or handles, and reposes upon a plate; pivot-pins, mounted upon arms are to be inserted into holes cut in a projection piece, on the arms is a scoop; the chain that maintains the receiver in its position is unhooked when the filled receiver is to be emptied or shifted for an empty one.

105.—PRESSURE OR TEMPERATURE REGULATORS: *L. H. Dugenait.*—The principle of the invention is applicable to reservoirs, ventilating contrivances, furnace dampers, and so on. For the automatical regulation of temperature a circuit is closed or opened by means of a maximum and minimum thermometer, the armature of the electro-magnet enables, as it moves, a train or similar gear to work a rod which is joined to the register or valve of a furnace or to a cold-air valve. The metallic rim of the insulating-disc of the regulator makes contact with the brushes and is joined to the metallic arm of a spindle. As the armature is attracted the wheel turns, and a shaft drives the valve or damper gearing. A double U-shaped pressure-gauge filled with mercury and hydrogen or nitrogen may replace the temperature gauge, and for the thermometer may be employed a coiled bi-metallic spring. In another form the electro-magnet is used only for bringing a motor into action in a relay circuit, whereby a number of ventilators may be worked by power, or the disc may be set to work three-way cocks, the amount of fluid to and from the pressure cylinder being thus regulated.

138.—A GAS-REGULATOR: *H. Cooney and W. A. Tilling.*—A cord and some adhesive material fasten a flexible diaphragm on to a ring, which is joined to the casing and is passed around a ring of white metal that is soldered to the other ring. The diaphragm is joined with a screw to a double-coned hollow equilibrium-valve, which has a middle pin for its guide, and has its upper part more inclined than is its lower part.

151.—A MITREING APPARATUS: *F. Kaiser.*—The inventor enables an adjustment to different heights and angles of the table and the saw-guides. He passes the saw through slots in telescopical rods which carry friction-rollers that guide the back of the saw-frame, and he pivots the saw-supports upon a horizontal axis, and also upon a vertical axis at the middle of the crossing rail. Pawls, or catches, hold the frames when adjusted at the angles required, and slotted standards adjust the varying height of the table.

177.—APPLIANCE FOR USE WITH BORING MACHINES: *C. Walton.*—For feeding the drill-spindle, the nut is held or retarded so as to control the feed, or is left free to arrest the feed, by means of a feed-nut that is placed within a block and a pinching-screw; the latter may consist of a split clamp to be tightened on to the nut. For a quick withdrawal of the feed-screw the nut is formed in two halves, and it can be taken out of the socket together with the feed-screw by a slackening of the pinching-screw.

191.—A CONTRIVANCE FOR BRICK-MOULDING MACHINES: *W. A. Bowie.*—The inventor seeks to prevent damage being done to the edges and sides of the bricks by means of a mould that has sides and a cover or lid pivoted on to a frame so that they shall turn outwards for liberating the moulded brick.

221.—APPLIANCES FOR WINDOW FRAME AND HINGED SLIDING SASHES: *B. Hausmann.*—In order that they may clear the beads when the sash is turned inwards, the hinge flaps are cranked, whilst the concaved flanges of the flaps are caused to slide in a curved guide affixed to the pulley-stile. An extension of the flap has a hooked lever for engagement with a hooked plate in the pulley-stile, providing for a support of the opened sash above the sill. As one turns the sash back within the frame, the contact of the hinge-plate with the tail piece of the lever forces the lever out of play against the force of gravitation or of a spring. A serrated eccentrical roller, which retains the inside bead in its position, is mounted upon a yoke frame whereof the pin enters a socket-piece in the upper portion of the pulley-stile. The pin will be held in its place by means of its lug that slides in a slot and a rounded groove cut in the socket. At the end of the sash-cord is a loop for engagement with a hook in the groove of the sash-stile. On swinging the sash inwards one can easily detach the loop.

275.—SWITCHES FOR ELECTRICAL LAMPS: *C. W. S. Crawley and W. L. Madgen.*—The lifting and lowering of the lamp, for which a spring or weight may be substituted, will work the switch; in the case of a ceiling-rose a tube, having for its guide a lug that slides in a slot, is caused to slide upon a tube affixed to the base, a catch upon the tube will pass into a hole in the fixed tube when it has been drawn downward against the action of a strong spring; an incline for freeing a catch is mounted upon an inner tube, which is joined with a rod to the lamp or the weight; on the sliding tube is a contact-ring, and when the tubes are pulled down the circuit becomes completed; a spring raises the inner tube when the lamp is lifted, and frees the catch, thereupon the spring will raise the sliding tube and contact will be broken.

280.—A PIPE-WRENCH: *A. Heberer.*—One of the shanks upon the jaws is extended so as to form the handle—the shanks being joined with pivoted bars and a loop, a cross-bar or pawl of the bars engages with teeth upon the outer side of the other shank, or, in a variant shape, a wedge is inserted and teeth upon the inner side of the shank will engage with a projection from one of the jaws; the shanks are kept apart, under normal conditions, with a spring, a loop which is secured to one shank slides upon the other; pressure upon one of the shanks will open the jaws.

301.—MEANS FOR HOLDING WINDOWS: *T. W. Robertson and D. Hamilton.*—On the sash are mounted rounded or conical studs which springs force outwards into either holes in the frame or pierced plates secured to the frame—otherwise the studs, let into the frame may be engaged with holes in the sash-stiles; the device is available equally for small sashes that slide vertically or sideways.

358.—IMPROVEMENTS IN STREET LAMPS: *F. F. Simmance and F. Abady.*—In order that a steady draught may be maintained through the lantern in spite of changes in the atmospherical conditions, the inventors put a spring, or weighted flap, or valve, in the inlet or the outlet passage; and so, in the latter case, also provide a door for lighting purposes. In one adaptation, the pivoted flap—of talc, aluminium, &c.—has a counter-balancing and adjustable weight upon a screw-threaded rod. As an increased draught lifts the flap, the rod becomes turned horizontalwise, so as to increase the leverage exerted by the counter-weight. In other forms, the flap, set horizontally, is caused to fall and rise upon a vertical spindle, or guide, and a spring or a chain, to be gradually raised by the ascent of the flap, is substituted for the weight and pivoted screw-threaded rod.

361.—A CONTRIVANCE FOR LAVATORY BASINS: *F. Shanks and H. Simpson.*—A folding lavatory basin is secured to the customary hinged tray by means of projections that are fitted upon the under-side of the basin, and fastened with a screw and a thumb-nut that is inserted underneath a metallic band affixed to the tray. Removal of the basin for cleaning it is effected by unscrewing the nut. In another form a wedge-shaped projection is employed (instead of one of the others), and is adapted to fit into a dovetail attached to the tray. Similar appliances will serve for fitting urinals upon the upright slab.

400.—COMPOUND FABRICS FOR BUILDERS' USE: *A. Gustorf.*—The fabrics are composed of felt and wire. Between two layers of asphalt or of roofing-felt coated with asphalt is introduced a middle part for strengthening or stiffening purposes, formed of open-meshed wire or gauze fabric embedded in plaster. The compound is then pressed between rollers. It is to be fastened with covering strips and nails to the beams and battens.

408.—APPARATUS FOR DOORS, WINDOWS, &C.: *M. Klingler.*—The free end of one portion of a double spring is joined to one leg of a staple whereof the other end turns upon a fixed bearing, whilst the free end of the other portion is pivoted upon a fixed stop, the staple will turn in its bearing and so cause the door to become shut through the action of a loop upon a pin affixed to the door—the turning of the staple being due to the efforts of the ends of the spring to separate from one another; when the bearing, the one leg of the staple, and the fixed stop are in alignment no turning force is exerted upon the staple so that the door will remain half-opened, but when it is opened further the spring comes into play to completely open the door; a violent closing of the door is prevented by a stud, in the path of the leg of the staple, that checks the door as it passes over the stud.

MEETINGS.

FRIDAY, MAY 2.

Architectural Association.—Members' supper at the Great Central Hotel, Marylebone-road. 7.30 p.m.

Institution of Junior Engineers.—Mr. Lewis H. Rugg, on "Some Factors in Colonial Railway Construction." 8 p.m.

Royal Institution.—Professor A. E. Tutton, F.R.S., on "Experimental Researches on the Constitution of Crystals." 9 p.m.

SATURDAY, MAY 3.

St. Paul's Ecclesiological Society.—Visit to Croydon (Parish Church, St. Michael's Church, Whitgift Hospital, and Old Palace), under the guidance of Mr. George Clinch.

British Institute of Certified Carpenters.—Monthly meeting, Carpenters' Hall. 6 p.m.

Edinburgh Architectural Association.—Visit to Torwood Castle and Broch of Tappock.

MONDAY, MAY 5.

Royal Institute of British Architects.—(1) Special general meeting to elect the Royal Gold Medallist for the current year. The Chairman to move—That, subject to his Majesty's gracious sanction, the Royal Gold Medal for the promotion of architecture be presented this year to Mr. Thomas Edward Collcutt, for his work as an architect. (2) Annual general meeting to receive and consider the annual report; to elect scrutineers for the annual election of the Council and Standing Committees; to nominate candidates as auditors for the ensuing year of office; to appoint the Statutory Board of Examiners under the London Building Act, 1894, and other Acts of Parliament, for the ensuing year of office; to elect candidates for membership. (3) At the same meeting the Institute will be asked to sanction the issue of a Form of Agreement and Schedule of Conditions for Building Contracts for use where quantities form part of the contract, the document being based on the form now in use, with such variations as are necessary to meet the requirements of the proposed new form. 8 p.m.

Society of Engineers.—Mr. B. D. Healey on "Recent Blast Furnace Practice." 7.30 p.m.

Society of Arts (Cantor Lectures).—Mr. R. T. Glazebrook, M.A., on "Glass for Optical Instruments." IV. 8 p.m.

Clerks of Works Association (Carpenters' Hall).—Mr. G. Roberts on "The Hygiene of Wall Decorations." 7.30 p.m.

TUESDAY, MAY 6.

Society of Arts (Applied Art Section).—Mr. Charles T. Jacobi on "The Printing of Modern Illustrated or Decorated Books." 8 p.m.

WEDNESDAY, MAY 7.

Royal Archæological Institute.—Professor Boyd Dawkins on "Bigbury Camp and the Pilgrim's Way." 4 p.m.

Society of Arts.—Mr. Albert Chancellor, J.P., on "The Origin and History of Carriages." 8 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting of the members. 8 p.m.

Institute of Sanitary Engineers, Ltd.—General Purposes and Finance Committee. 4 p.m. Election of Committee. 5.15 p.m. Council meeting. 7 p.m.

THURSDAY, MAY 8.

Royal Institution.—Mr. A. Smith Woodward, LL.D., F.R.S., on "Recent Geological Discoveries." II. 3 p.m.

Institution of Electrical Engineers.—Conclusion of discussion on "Form of Model General Conditions." 8 p.m.

FRIDAY, MAY 9.

Architectural Association.—(1) Mr. Owen Fleming on "Artisans' Dwellings from the Municipal Point of View"; (2) Mr. Louis Ambler on "Artisans' Dwellings from the Private Point of View." 7.30.

SATURDAY, MAY 10.

Institution of Junior Engineers.—Visit to the Great Eastern Railway Works, Stratford. Train from Liverpool-street at 9.17 a.m.

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SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 17.—By PROTHEROE & MORRIS (on the estate).

Herne Bay, Kent.—Rowland Drive, &c., 46 plots of freehold building land (in lots) £384

By BROAD, WILTSHIRE, & PENNY (at Sutton)

Sutton, Surrey.—1 and 2, Helston-villas, f., e.r. 55*l.* 820

April 18.—By PROTHEROE & MORRIS (on the estate).

Pegwell Bay, Kent.—Main-rd., &c., 63 plots of freehold building land (in lots) 868

April 21.—By JOHN BUSSEY.

Bromley-by-Bow.—150, Chrisp-st, with factories, out-buildings, &c., part f. and part u.t. 49 yrs., g.r. nil, e.r. 250*l.* 3,300

Poplar.—Robin Hood-lane, a block of building land, area 2,045 ft., f. 250

12 and 14, Jeremiah-st., f., w.r. 36*l.* 8s. 350

By ANSCOMBE & RINGLAND.

St. John's Wood.—54, Hamilton-ter., u.t. 36 yrs., g.r. 18*l.* 4s., p. 1,900

By CHANCELLOR & SONS.

Richmond Hill.—King's-rd., Faircroft, u.t. 77 yrs., g.r. 30*l.*, p. 2,570

By ELLIS & SON.

Loughton, Essex.—Church Hill, Uplands, and 18 a. 0 r. 19 p., f., p. 5,250

By WM. HOUGHTON.

Walthamstow.—99 and 101, Oatland-rise, f., w.r. 33*l.* 16s. 335

28 and 30, Worcester-rd. West, f., w.r. 44*l.* 4s. 500

Hale End-rd., a freehold building site 170

By PROTHEROE & MORRIS.

St. Margaret's Bay, Kent.—Trafalgar-rd., &c., 78 freehold building plots (in lots) 804

April 22.—By H. J. BROMLEY.

Forest Hill.—Honor Oak Pk., i.g.r.'s 28*l.* 10s., u.t. 64 yrs., g.r. nil. 585

103, Stanstead-rd., "Corcyra," u.t. 72 yrs., f., w.r. 28*l.* 12s. 350

Sydenham.—Panmure-rd., Corcyra, u.t. 72 yrs., g.r. 25*l.* 10s., e.r. 65*l.* 300

By FRANCIS DOD & CO.

Stoke Newington.—18, 20, and 22, Victoria-grove West, u.t. 42 yrs., g.r. 8*l.* 10s., w.r. 91*l.* 6s. .. 660

St. Luke's.—97, 99, and 101, Central-st. Corporation lease, u.t. 51 yrs., g.r. and fines nil. 1,300

Caledonian-rd.—66, Gifford-st., u.t. 48 yrs., g.r. 6*l.*, y.r. 36*l.* 295

Bermondsey.—231, Abbey-st., f., y.r., 36*l.* 460

1A, Flockton-st., f., w.r. 26*l.* 275

Camberwell. — 1 to 5, Hopewell-pl., f., w.r. 58*l.* 10s. 410

Stamford Hill.—29, Daleview-rd., u.t. 68 yrs, g.r. 6*l.*, e.r. 34*l.* 320

Edmonton.—Wakefield-st., four plots of building land, f. 205

By DEBENHAM, TEWSON, & CO.

Hampstead.—10, Strathray-gdns., u.t. 78¼ yrs., g.r. 2*l.*, y.r. 350*l.* 5,500

By GOODMAN & CROWTHER.

Cheddington, Bucks.—Station-rd., The Myrtle Villa and 1 a. 1 r. 12 p., f., p. 550

Brixton.—28, Grove-rd., u.t. 23¾ yrs., g.r. 5*l.* 15s., p. 340

By WALFORD & WILSHIN.

Norwood.—46 and 48, Auckland-rd., u.t. 79 yrs., g.r. 16*l.* 16s., y.r. 95*l.* 855

49, Penge-rd., u.t. 65 yrs., g.r. 7*l.* 10s., e.r. 30*l.* 190

By WESTON & SONS.

treatham.—36, Leigham-vale, u.t. 81 yrs., g.r. 6*l.* 10s., y.r. 36*l.* 270

By C. P. WHITELEY.

Regent's Pk.—13, Chester-ter. and 13, Chester-mews, u.t. 13¾ yrs., g.r. 52*l.* 10s., y.r. 275*l.* .. 1,500

Isleworth (Middx.).—73, 75, 77, and 79, Linkfield-road, u.t. 94½ yrs., g.r. 13*l.*, w.r. 83*l.* 4s. 660

By G. F. HARRINGTON.

Willesden.—Rucklidge-av., f.g.r.'s 91*l.* 10s., reversion in 77 yrs. 2,250

Plaistow.—Balaam-st., f.g.r. 36*l.*, reversion in 80 yrs. 850

Forest Hill.—Perry-vale, f.g.r.'s 80*l.*, reversion in 71 yrs. 2,310

Stanstead-rd., f.g.r.'s 54*l.*, reversion in 71 yrs... 1,490

Catford.—Perry Hill, Rutland Hotel, f.g.r. 100*l.*, reversion in 47½ yrs. 2,860

Camberwell.—Bengeworth-rd., f.g.r.'s 86*l.*, reversion in 71 yrs. 2,185

Wimbledon.—Worple-rd., f.g.r. 10*l.*, reversion in 65 yrs. 320

Tabor-gr., f.g.r.'s 19*l.* 10s., reversion in 65 yrs... 595

Tabor-gr., f.g.r. 12*l.*, reversion in 76 yrs. 360

St. George's-rd., f.g.r.'s 49*l.*, reversion in 76 yrs. 1,540

St. George's-rd., f.g.r.'s 36*l.*, reversion in 65 yrs. 1,075

St. George's-rd., f.g.r.'s 28*l.*, reversion in 76 yrs. 895

By J. C. PLATT (at Hammersmith).

Chiswick.—5 and 7, South-parade, f., y.r. 107*l.* .. 1,800

High-rd., Hamilton House, u.t. 88 yrs., g.r. 10*l.* 15s., e.r. 80*l.* 830

April 23.—By BAXTER, PAYNE, & LEPPER.

Morden, Surrey.—The Elms, u.t. 67 yrs., g.r. 14*l.* 10s., p. 770

By TAYLOR, LOVEGROVE, & CO.

Hyde Park.—28, Kensington Gdns.-ter., u.t. 25 yrs., g.r. nil, y.r. 100*l.* 1,200

South Kensington.—10, Petersham-ter., u.t. 54 yrs., g.r. 24*l.*, y.r. 150*l.* 1,855

Paddington.—Howley-pl., i.g.r's 150*l.*, u.t. 35 yrs, g.r. 2*l.* 2,320

Kensington.—Holland Pk.-rd., 5, The Studios, u.t. 66 yrs., g.r. 18*l.*, e.r. 90*l.* 650

By T. N. TURNER.

Marylebone.—9, New Quebec-st. (dairy), u.t. 26 yrs., g.r. 20*l.*, y.r. 105*l.* 990

Regent's Park.—53, Gloucester-cres., u.t. 60 yrs., g.r. 1*l.*, y.r. 50*l.* 590

Notting Hill.—2, Rillington-pl., u.t. 61 yrs., g.r. 6*l.* 10s., y.r. 32*l.* 265

Holloway.—Campdale-rd., i.g.r.'s 48*l.*, u.t. 72½ yrs., g.r. 15*l.* 10s. £605

April 24.—By HOLLIS & HARRIS.

Hendon.—Sunningfields-rd., Westridge, u.t. 77 yrs., g.r. 10*l.* 10s., e.r. 65*l.* 450

By NEWBON, EDWARDS, & SHEPHERD.

Clerkenwell.—1, Warden's-court or pl., f., w.r. 40*l.* 6s. 330

Hammersmith.—4, Amor-rd., u.t. 74 yrs., g.r. 7*l.* 10s., y.r. 36*l.* 360

Islington.—9, Gibson-sq., u.t. 16 yrs., g.r. &c. 9*l.*, y.r. 48*l.* 235

13, Theberton-st., with stable and warehouse, u.t. 12 yrs., g.r. 6*l.* 16s., y.r. 65*l.* 315

49, College-st., u.t. 14 yrs., g.r. 2*l.*, y.r. 40*l.* .. 225

Clerkenwell.—6½ and 9, Hallett's-pl., u.t. 13½ yrs., g.r. 12*l.*, w.r. 59*l.* 16s. 155

St. Luke's.—70 to 76 (even), Gee-st., u.t. 7 yrs., g.r. 24*l.*, w.r. 114*l.* 8s. 190

Hoxton.—60, Baring-st. (manufacturing premises), u.t. 30½ yrs., g.r. 6*l.* 5s., y.r. 125*l.* 1,000

Holloway.—4 and 5, Andover-gdns., u.t. 50 yrs., g.r. 7*l.*, w.r. 49*l.* 8s. 250

Islington.—11, Ockenden-rd., u.t. 35½ yrs., g.r. 6*l.* 10s., e.r. 50*l.* 400

Notting Hill.—117, Portobello-rd., u.t. 49½ yrs., g.r. 8*l.*, y.r. 105*l.* 450

By STIMSON & SONS.

St. Luke's.—2, Sycamore-st. (warehouse), u.t. 51½ yrs., g.r. 30*l.*, y.r. 87*l.* 10s. 260

Fulham.—1, 4 to 18, Bedford-pl., f., w.r. 261*l.* 16s. 1,850

Peckham.—7 and 9, Commercial-rd. (St. Luke's Institute), f., y.r. 60*l.* 1,010

164 and 166, High-st. (S.), y.r. 210*l.*, also i.g.r. 5*l.*, u.t. 16½ yrs., g.r. 55*l.* 800

Brixton.—33 and 34, Thornton-st., u.t. 23 yrs., g.r. 6*l.*, w.r. 85*l.* 16s. 450

12, Chantry-rd., u.t. 69½ yrs., g.r. 7*l.*, y.r. 38*l.* 440

Walworth.—69 and 71, Penrose-st. (S.), f., y.r. 58*l.* 4s. 650

Wandsworth rd.—No. 394, u.t. 53 yrs., g.r. 4*l.*, y.r. 55*l.* 630

East Ham.—41 and 47, Katherine-rd., f., y.r. 60*l.* 745

By J. A. & W. THARP.

Spitalfields.—77 and 79, Commercial-st. (S.), f., y.r. 120*l.* 2,525

7 and 8, Tilley-st., f., w.r. 143*l.* 1,750

Stratford.—46, 47, and 48, Forest-lane, f., y.r. 89*l.* 1,210

92, Leytonstone-rd., f., y.r. 28*l.* 585

By TUCKETT & SON.

Kensington.—3 and 5, Pitt-st., u.t. 41½ yrs., g.r. 16*l.*, y.r. 175*l.* 1,700

Forest Hill.—6, Marmora-rd., u.t. 78½ yrs., g.r. 10*l.*, e.r. 50*l.* 305

By VARLEY & LOCKING.

Finsbury.—24, Portland-rd., u.t. 57 yrs., g.r. 12*l.* 12s., e.r. 70*l.* 585

By FAREBROTHER, ELLIS, & CO.

Hornsey Rise.—Hornsey Rise-gdns., f.g.r.'s 226*l.* 14s., reversion in 80½ yrs. (in lots) 6,140

Hornsey Rise-gdns., f.g.r. 10*l.* 13s., also peppercorn g.r., reversion in 80½ yrs. 600

Hornsey Rise, f.g.r.'s 157*l.* 10s., reversion in 80½ yrs. (in lots) 4,640

Holloway.—St. John's-rd., f.g.r.'s 75*l.*, reversion in 46½ yrs. 2,060

Queensland-rd., the Queen's Arms p.-h., f.g.r. 45*l.*, reversion in 31½ yrs. 2,300

Queensland-rd., f.g.r.'s 42*l.*, reversion in 31½ yrs. 1,145

April 25.—By BROWETT & TAYLOR.

Brondesbury.—72, 74, 76, and 78, Maygrove-rd., f., y.r. 160*l.* 2,230

86, 88, and 90, Iverson-rd., u.t. 77½ yrs., g.r. 24*l.*, y.r. 116*l.* 1,270

Hendon.—5, 7, 9, and 11, Bellevue-ter., u.t. 79 yrs., g.r. 15*l.*, w.r. 101*l.* 8s. 440

17, 22, 21, and 23, Bellevue-ter., u.t. 81 yrs., g.r. 16*l.*, w.r. 98*l.* 16s. 440

By WM. CLARKSON.

Stepney.—565, Commercial-rd. (S), c., e.r. 100*l.* (with goodwill) 850

By C. RAWLEY CROSS & CO.

Kensington.—22 and 24, Dewhurst-rd., u.t. 79 yrs., g.r. 16*l.*, y.r. 110*l.* 1,200

Acton Hill.—14, Elmwood-gdns., u.t. 95 yrs., g.r. 11*l.* 11s., y.r. 10*l.* 690

By DOLLMAN & PEARCE.

Hampstead.—66, Adelaide-rd., u.t. 41 yrs., g.r. 10*l.*, p. 370

120, Fellows-rd., u.t. 62½ yrs., g.r. 2*l.*, y.r. 100*l.* 960

Haverstock Hill.—12, Parkhill-rd., u.t. 48 yrs, g.r. 12*l.*, p. 850

By JONES, LANG, & CO.

Shoreditch.—35 and 37, Great Eastern-st., u.t. 55 yrs., g.r. 139*l.*, y.r. 470*l.*; 30 and 31, Holywell-lane, u.t. 55 yrs., g.r. 55*l.*, y.r. 280*l.*; 58, Curtain-rd., u.t. 56 yrs., g.r. 50*l.*, y.r. 170*l.* .. 500

By FRANK MELROSE.

St. John's Wood.—30, Blenheim-ter., u.t. 84¾ yrs., g.r. 12*l.* 12s., w.r. 70*l.* 1,000

By C. SPARROW & SON.

Finchley.—Regent's Pk.-rd., Highcroft., u.t. 77½ yrs., g.r. 5*l.*, y.r. 75*l.* 1,625

Woodside Pk.-rd., Tredinnock, f., y.r. 90*l.* 80

By MONTAGU & ROBINSON.

Limehouse.—Eastfield-st., f.g.r. 2*l.* 5s., reversion in 19 yrs. 1,835

Clapham.—16, 18, 20, and 22, Kildoran-rd., f., y.r. 125*l.* 775

Spitalfields.—45, Brushfield-street (S.), f., y.r. 37*l.* 750

Whitechapel.—40 and 42, Thomas-st., c., w.r. 54*l.* 12s. 225

Maida Vale.—13, Elgin-mews South (stabling), u.t. 57½ yrs., g.r. 5*l.*, y.r. 25*l.* 1,150

Finsbury Park.—380, Green Lanes (S.), u.t. 72½ yrs., g.r. 15*l.*, y.r. 85*l.* 900

Hermitage-rd., Boston House, u.t. 72½ yrs., g.r. 4*l.*, e.r. 90*l.* 185

32, Park-rd., u.t. 78½ yrs., g.r. 5*l.* 10s., w.r. 28*l.* 12s. 2,920

By A. J. SHEPPIELD.

Poplar.—158 to 170, 176 to 182 (even), Abbott-rd., u.t. 71 yrs., g.r. 54*l.*, w.r., 421*l.* 4s. 925

24 to 30 (even), Glencoe-st. (S.), u.t. 71 yrs., g.r. 17*l.*, w.r. 128*l.* 14s. 5

11 and 12, Highland-st., u.t. 71 yrs., g.r. 8*l.* 10s., w.r. 59*l.* 16s. .....

14, 15 and 16, Highland-st. (S.). u.t. 71 yrs., g.r. 13*l.*, w.r. 104*l.* £715

17, Sturry-st., u.t. 47 yrs., g.r. 6*l.*, y.r. 45*l.* 350

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; w.r. for weekly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 11 6	per 1,000 alongside, in river	
Rough Stocks and Grizzles	1 9 6	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 5 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts ..	1 12 0	,,	
Best Fareham Red	3 12 0	,,	,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,,	,, ,,
Do., Bullnose	4 10 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 5 6	,,	,, ,,

GLAZED BRICKS

Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers..	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers..	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.
Thames and Pit Sand	7 3	per yard, delivered.	
Thames Ballast	6 0	,,	,,
Best Portland Cement	32 0	per ton, delivered.	
Best Ground Blue Lias Lime..	25 0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 11s. 0d. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
Ancaster in blocks	1 11	per ft. cube, deld. rly. depot.	
Bath ,, ...	1 7	,,	,,
Farleigh Down Bath ..	1 8	,,	,,
Beer in blocks	1 6	,,	,,
Grinshill ,, ...	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks..	2 4	,,	,,
Red Corsehill ,,	2 5	,,	,,
Closeburn Red Freestone	2 3	,,	,,
Red Mansfield ,,	2 4	,,	,,
Hard York in blocks ..	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt.	
,, ,, 6 in. Rubbed Ditto..	3 0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 2 in. self-faced Ditto	0 9½	,,	,,
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt.	
,, ,, ,, 6 in. sawn both sides landings	2	7 per ft. super. deld. rly. depôt.	
,, ,, ,, 3 in. do.	1 2½	,,	,,

SLATES.

in. in.	£ s. d.		
20×10 best blue Bangor..	12 0 0	per 1000 of 1200 at rly. dep.	
,, best seconds ,,	11 10 0	,,	,,
16×8 best ,,	6 15 0	,,	,,
20×10 best blue Portmadoc ..	11 5 0	,,	,,
16×8 best blue Portmadoc	6 0 0	,,	,,
20×10 best Eureka unfading green....	12 2 6	,,	,,
16×8 ,, ,,	7 5 0	,,	,,
20×10 permanent green	10 5 0	,,	,,
16×8 ,, ,,	5 17 6	,,	,,

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PRICES CURRENT (*Continued*).

TILES.

	s.	d.		
Best plain red roofing tiles	41	6	per 1,000, at rly. depôt.	
Hip and valley tiles	3	7	per doz.	,, ,,
Best Broseley tiles	48	6	per 1,000	,, ,,
Hip and valley tiles	4	0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57	6	per 1,000	,, ,,
Do. ornamental Do.	60	0	,,	,, ,,
Hip tiles	4	0	per doz.	,, ,,
Valley tiles	3	9	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50	9	per 1,000	,, ,,
Hip tiles	4	1	per doz.	,, ,,
Valley tiles	3	8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 0 0
Deals: best 3 by 9	13 10 0	15 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	10 10	11 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2 in. by 4½ in. and 2 in by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft.)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
,, ,, 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
,, ,, ,, 3 in. by 9 in.	12 0 0	13 0 0
,, ,, ,, battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
¾ in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6

	Per square.	
Prepared Flooring— 1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Common Bars	7 15 0	8 5 0
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON— Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 10 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	12 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g.	16 0 0	- - -
,, ,, 22 g. and 24 g.	16 10 0	- - -
,, ,, 26 g.	18 0 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 0 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 5 0	9 15 0

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 7 6	- - -
Pipe in coils	14 17 6	- - -
Soil Pipe	17 7 6	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0	- - -
Thin ,,	0 1 1½	- - -
Copper nails ,,	0 1 1½	- - -
BRASS— Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3½	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8	- - -
Blowpipe ,,	0 0 9	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds per ft. delivered.	2½d.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths	3d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, fourths	4d. ,, ,,
32 oz. thirds	5¼d. ,, ,,
,, fourths	5d. ,, ,,
Fluted sheet, 15 oz.	3d. ,, ,,
,, 21 ,,	4d. ,, ,,
⅛ Hartley's Rolled Plate	2d. ,, ,,
3/16 ,, ,, ,,	2¼d. ,, ,,
¼ ,, ,, ,,	2½d. ,, ,,

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes per gallon	0 2 8
,, ,, ,, in barrels ,,	0 2 9
,, ,, ,, in drums ,,	0 2 11
Boiled ,, ,, in pipes ,,	0 2 10
,, ,, ,, in barrels ,,	0 2 11
,, ,, ,, in drums ,,	0 3 1
Turpentine, in barrels ,,	0 2 8
,, in drums ,,	0 2 10
Genuine Ground English White Lead per ton	21 0 0
Red Lead, Dry ,,	20 10 0
Best Linseed Oil Putty per cwt.	0 8 6
Stockholm Tar per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copla Varnish for outside work	0 16 6
Best Elastic Copa lVarnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

G. & F.—T. S. (Amounts should have been stated). "Canvass" (We do not understand your question. There is no such reference in our issue of January 3).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ABERDEEN.—For reconstruction and enlargement of Woodside public school, for the School Board. Mr. J. A. O. Allan, architect, 22, Union-terrace, Aberdeen. Quantities by Messrs. Hendry & Addie, Union-street, Aberdeen:—
Masonry.—G. Hall*
Carpentry.—Hendry & Keith*
Slating.—Merson & Stewart*
Plastering.—Scott & Son*
Plumbing.—Thom & Strachan*
Painting and Glazing.—Murray & Mitchell*
Steelwork.—McKinnon & Co.*
Iron and Smith Work.—Abernethy & Co.*
£17,087 18
[All of Aberdeen.]

ABERDEEN.—For enlargement of Rosemount Public School, for the School Board. Mr. J. A. O. Allan, architect, 22, Union-terrace, Aberdeen. Quantities by Messrs. Hendry & Addie, Union-street, Aberdeen:—
Masonry.—Gall & Walker*
Carpentry.—Leslie & Hay*
Slating.—Adam Martin*
Plastering.—Scott & Son*
Plumbing.—Alex. Fiddes*
Painting and Glazing.—Mason & Sons*
Heating.—John A. Sangster*
£7,338 19 6
[All of Aberdeen.]

ALDFIELD.—For Aldfield Wesleyan Chapel, near Ripon. Mr. Thomas Stokes, architect, Thirsk. Quantities by architect:—
J. H. Coldbeck, Ripon £478 10

ANDOVER (Hants).—For the erection of a pair of cottages, Lower Cranbourne Farm, near Sutton Scotney, for Mrs. McCreagh Thornhill. Messrs. W. & G. A. Bell, architects, Andover:—

Beale & Sons	£663	Sydney Bell	£565
Goodall	659	Grace & Son	538

BARNSLEY.—For the erection of stone boundary walls, Pogmoor-road, &c., for the Guardians. Messrs. Crawshaw & Wilkinson, architects, 13, Regent-street, Barnsley:—
Higham & Son, Measbro' Dyke, Barnsley £472 18 4

BARNSLEY.—For the erection of six houses, Joseph-street, Grimethorpe. Messrs. R. & W. Dixon, architects, 5, Eastgate, Barnsley:—

Masonry and Bricklaying.
George H. Brown, Barnsley £474 0

Carpentry and Joinery.
W. G. & L. England, Barnsley 230 0

Plumbing and Glazing.
J. Binns, Cudworth 30 0

Plastering.
J. H. Seacroft, Grimethorpe 57 0

Slating.
E. Fleming, Barnsley 64 0

Painting.
J. P. W. Sykes, Cudworth 19 18

BATH.—For the execution of building works at the Statutory Hospital, Claverton Down. Mr. F. W. Gardiner, architect, Barton-street, Bath:—

Discharging Ward.

F. Parsons	£288 0 0	G. Fisher	£211 12 6
J. Foster	236 0 0	C. Wibley, James-street, Bath*	206 10 0
Mould Bros.	216 0 0		

Disinfecting Rooms.

Coleby & Sons	£113 4 0	Mould Bros.	£88 0 0
C. Wibley	99 10 0	G. Fisher, Combe Down*	61 10 6
J. Foster	95 0 0		
F. Parsons	92 10 0		

BATH.—For rebuilding of the Gloucester Inn, Somerset-buildings, Bath, for Mr. J. Clark. Mr. F. W Gardiner, architect, Barton-street, Bath:—

Uphill	£959 12	W. Webb	£849 0
Chancellor & Sons	949 0	J. Foster	798 0
Erwood & Morris	928 0	F. Parsons, Railway-place, Bath*	789 0
Wills & Sons	850 0		

BEAMINSTER (Dorset).—For the erection of institute and public hall. Mr. B. Vaughan Johnson, architect, 20, Victoria-street, Westminster, S.W.:—

C. & A. Hann	£1,383	B. B. Chambers, Beaminster*	£1,170
J. G. Sprackling	1,250		

BEESTON (Notts).—For the erection of six dwelling houses, situate in King-street. Mr. Fred. C. Martin, architect, Nottingham:—

E. Spray	£1,278	T. H. Harper, Carlton*	£1,125
E. Ascroft	1,202		
A. Caunt	1,170		

See also page 459.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*New Municipal Offices	Crewe Corporation	50*l.* and 25*l.*	June 12

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Additions to Schools, Kenton	Harrow U. D. School Board	A. Fillmore, High-street, Harrow	May 6
House, Holcombe, near Dawlish, Devon	.....	C. Cole, Architect, 50, High-street, Exeter	do.
Bakery, Court-street, Trowbridge	.....	W. W. Snailum, Architect, Church-street, Trowbridge	do.
Making-up Bolton-road	Windsor Town Council	Borough Surveyor, Alma-road, Windsor	do.
Timber Work, Provan Gasworks	Glasgow Corporation	W. Foulis, Engineer, 45, John-street, Glasgow	do.
Road Metal, &c.	Hetton-le-Hole (Durham) U.D.C.	J. Harding, Surveyor, Council Office, Hetton-le-Hole, R.S.O.	do.
Road Metal (1,000 tons)	Chipping Norton Town Council	T. Mace, Chipping Norton	do.
Wealeyan Church and Schools, Bishop's Stortford	.....	Gordon & Gunton, Architects, Finsbury House, Blomfield-st., E.C	May 7
Chapel, Callington, Cornwall	.....	Rev. J. Datson, Launceston-road, Callington	do.
Model Lodging House, Pottergate, Alnwick	.....	G. Reavell, jun., Architect, Alnwick	do.
Two Cottages, Kirkby Mallory, Hinckley	.....	A. W. Byron, 5, Low-pavement, Chesterfield	do.
Six Houses, North-street, Lockwood, nr. Huddersfield	.....	J. Berry, Architect, 3, Market-place, Huddersfield	do.
Cast Iron Water Mains, &c.	Selkirk Town Council	H. W. Taylor, Civil Engineer, Newcastle-on-Tyne	do.
Sewerage Works, Swinton (Lancs.)	Swinton and Pendlebury U.D.C.	H. Entwisle, Surveyor, Council Offices, Swinton	do.
Cast Iron Pipes, &c.	Withnell (Lancs.) U.D.C.	T. Beaver, Surveyor, Brinscall, near Blackburn	do.
Sewerage Works, &c., Cross Bank	Limehurst R.D.C.	Hinnell & Murphy, Civil Engineers, 26, Corporation-st., M'chester.	do.
Culvert, Greenbank	Bristol Corporation	J. H. Yabbicom, Civil Engineer, 63, Queen-square, Bristol	do.
*Park Fence at Homes, Goldie Leigh	Woolwich Union	Church, Quick & Co., Architects, Woolwich	do.
Road Works, Trinity-crescent	Leith (N. B.) Town Council	Borough Surveyor, Town Hall, Leith	do.
Additions to Schools, Falmouth	National School Managers	Managers, Church House, Falmouth	do.
Additions to Sea Wall, Craighall-road	Leith (N.B.) Town Council	Borough Surveyor, Town Hall, Leith	do.
Three Buttresses, Craighall-road	do.	do.	do.
Offices	Goole Steam Shipping Co., Ltd.	G. W. Atkinson, Architect, 1, Mark-lane, Leeds	do.
*Extension of Boiler House at Osborne-street	Borough of Colchester	Borough Engineer, Town Hall, Colchester	do.
Waterworks, Llangattock	Crickhowell R.D.C.	T. Rees, Civil Engineer, Newport, Mon.	May 8
Wall at Electric Power Station, Newport-road	Cardiff Corporation	W. Harpur, Civil Engineer, Town Hall, Cardiff	do.
Greenhouse Foundations, &c., Roundhays Park	Leeds Corporation	City Engineer, Town Hall, Leeds	do.
Store Buildings, &c.	Chesterfield Co-op. Society	G. Haslam & Son, Architects, Euclid House, Ilkeston	do.
Factory and Workhouse, Dubb-lane, Bingley, Yorks.	Mr. R. Garnett	W. R. Nunns, Architect, Market-street, Bingley	May 9
Reconstructing Westfields Mill, nr. Blairgowrie, N.B.	.....	L. Falconer, Architect, 27, Bank Buildings, Blairgowrie	May 10
Rebuilding House, Bundoran, Ireland	.....	W. S. Jervois, Architect, Armagh	do.
Schools, Uxbridge	.....	Heron & Co., 54, High-street, Uxbridge	do.
Restoration Carmel Chapel, Beaufort, Wales	.....	Hy. Waters, Beaufort	do.
Church Tower, Durrow, Ireland	Rev. Canon Shortal	W. H. Byrne, Architect, 20, Suffolk-street, Dublin	do.
Additions to Asylum	Derby Corporation	B. J. Jacobs, Architect, Bowlalley-lane, Hull	do.
Surveyor's Materials	Church (Lancs.) U.D.C.	W. E. Wood, Surveyor, Church	do.
Street Works, &c., Back Grimshaw-street, West, &c.	do.	do.	do.
Additions to School	Llangadock School Board	J. F. Morgan, High Gate, Llangadock	do.
House and Shop, Llanharan, Wales	.....	Jas. Smith, G. W. Cottages, Llanharan	do.
Additions to Asylum	Derby Corporation	B. S. Jacobs, Architect, Bowlalley-lane, Hull	do.
Church Tower, &c., Durrow, Queen's Co.	Canon Shortal	W. H. Byrne, Architect, 20, Suffolk-street, Dublin	do.
Show Buildings, &c., Enniscorthy, Ireland	.....	E. S. O'Brien, Architect, The Westgate, Wexford	do.
Extensions to Car Sheds, Lewes-road	Brighton Corporation	F. J. Tillstone, Town Hall, Brighton	May 12
Twenty-seven Cottages	Carlow U.D.C.	J. Byrne, Civil Engineer, Town Hall, Carlow	do.
Church and Schools, Padiham-road, Burnley	.....	J. B. Thornley, Architect, 45, Market-street, Darwen	do.
School, Offices, &c., Llanbedrgoch, Anglesby	.....	J. Owen, Architect, Menai Bridge, North Wales	do.
Additions to Offices, North-street	Bishops Stortford U.D.C.	R. S. Scott, Civil Engineer, North-street, Bishops Stortford	do.
*Water Supply Works	Faringdon R.D.C.	Council's Engineer, Abingdon	do.
*Wood Paving Blocks	St. Marylebone Borough Council	Council's Engineer, Town Hall, Marylebone, W.	do.
*Eight Transformer Chambers	West Ham Council	Council's Engineer, Town Hall, West Ham, E.	May 13
*Storage Reservoir at Barnattin	Drogheda Corporation Waterwrks.	G. N. Kelly, Civil Engineer, Gas and Water Offices, Drogheda	do.
Subway, &c.	Dublin Corportion	S. Harty, Civil Engineer, City Hall, Dublin	do.
*Hot-water Supply at Isolation Hospital, Stonebridge	Willesden U.D.C.	Engineer to the Council, Public Offices, Dyne-road, Kilburn, N.W.	do.
Road Works, Llanwern Hill	Magor R.D.C.	J. Thomas, Union Offices, Queen's Hill, Newport	do.
School, Mynyddcerrig	Llandebie U. D. School Board	D. Jenkins, Architect, Llandilo	do.
Shed, Pontypool-road	Great Western Railway Co.	J. K. Mills, Paddington Station, London	do.
*Concrete River Wall, &c.	Fulham Borough Council	Council's Engineer, Town Hall, Fulham	May 14
*Making-up and Paving Street	do.	do.	do.
*Lunatic Wards at Workhouse, Tooley-street	St. Olave's Union	Newman & Newman, Architects, 31, Tooley-street, S.E.	May 15
*Alterations to Lecture Hall, Royal Hill	Metropolitan Boro' of Greenwich	Town Clerk, Town Hall, Greenwich-road, S.E.	May 16
*Building Public Baths, Old Trafford, Manchester	Stretford U.D.C	Ernest Woodhouse, Architect, 88, Mosley-street, Manchester	May 17
*Engineering and Boilers, &c., Public Baths	do.	do.	do.
*Gatehouse Lodge and Four Cottages, near Horley	London County Council	Architect's Department, County Hall, Spring Gardens, S.W.	do.
Pipe Sewers, &c.	Penrith (Cumberland) R.D.C.	J. Graham, Engineer, Bank-street, Carlisle	May 19
*Extension of Asylum	East Riding Lunatic Asylum Com.	Board Room, at Asylum, Beverley	May 21
*Fog Signal House, &c., near Whitby	Trinity House Corporation	The Lighthouse, Whitby	May 22
*Erection of Schools	Lowestoft School Board	Clerk to Board, 115, High-street, Lowestoft	May 23
*Additions, &c., Higham Hill Schools	Walthamstow School Board	H. Prosser, Architect, Walthamstow	May 26
*Erection of Palace Theatre, Halifax	.....	R. Horsfall & Son, Architects, Halifax	No date
Two Houses, Higham Ferrers, Northants	.....	G. Hall, Architect, Higham Ferrers	do.
House, Waterloo-road, Hunslet	.....	Danby & Simpson, Architects, 10, Park-row, Leeds	do.
Bank Premises, Great Horton	Bradford Old Bank, Ltd.	Jackson & Priestman, Architects, Exchange Building, Bradford	do.
Rebuilding House, Parkstone, Dorset	.....	Hawker & Mitchell, Architects, Bournemouth	do.
Church, Dartnall, near Sheffield	.....	Moulds & Porritt, Architects, 77, King-street, Manchester	do.
Factory, &c., Chesterfield-st., Carlton, nr. Nottingham	.....	J. H. Savidge, Architect Wheelergate, Nottingham	do.
Schools, Apperley Bridge, Leeds	.....	Danby & Simpson, Architects, 10, Park-row, Leeds	do.
*Engineering and other Works	Malling Union	W. L. Grant, Architect, Sittingbourne	do.
shop, Chimney, &c., Long Eaton	Messrs. S. J. Claye, Ltd.	E. E. Ridgeway, Architect, Long Heaton, near Nottingham	do.
Alterations to Business Premises, 48, Highgate, Kendal	Messrs. T. Leighton & Son	J. Hutton, Architect, Kendal	do.
*Laundry Buildings, &c.	Dudley Union	A. Marshall, Architect, King-street, Nottingham	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Building Inspector	Hendon U.D.C.	150*l.*	May 12
*Clerk of Works	Kingsbury U.D.C.	Not stated	May 14
*Inspector of Buildings & Private Street Improvements	Beckenham U.D.C.	130*l.*	May 15
*Superintendent of Sewers and Drains	St. Marylebone Borough Council	150*l.*	May 16
*Road Foreman	Hornsey U.D.C.	2*l.* 5*s.* per week, &c.	May 17
*Assistants	London County Council	Not stated	May 19
*Chief Assistant	do.	400*l.*	May 22

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, p. lv. *Contracts*, pp. lv. vi. viii. x. & xxii. *Public Appointments*, xviii. & xix.

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TENDERS (*Continued*):—

BRENTFORD.—For the erection of schools, Ealing-road, for the Old Brentford Board School. Messrs. Nowell Parr & A. E. Kates, architects, 5, Brent-road, Brentford, W.:—

Kellet & Sons, Ltd.	£14,911 0 0	W. Wisdom	£12,051 8 4
J. W. Brooking	13,140 0 0	R. M. Hughes	11,974 0 0
Barker & Co.	12,650 0 0	B. E. Nightingale	11,933 0 0
Foster Bros.	12,638 0 0	F. G. Minter	11,907 0 0
Parsons & Co.	12,553 0 0	E. Chamberlain	11,763 0 0
R. L. Tongue	12,499 0 0	W. Blackburn	11,671 0 0
Soole & Son	12,454 0 0	Gaze & Son	11,594 0 0
Godson & Son	12,390 0 0	Gough & Co., Hendon*	11,534 0 0
F. & E. Davey	12,200 0 0	Braid, Pater, & Co.	11,408 0 0
Chessum & Son	12,054 0 0		

[Architect's estimate, £11,820.]

CHERRYHINTON (near Cambridge). — For the forming and making of new roads and paths, for the Chesterton Rural District Council. Messrs. Waters & Worrall, engineers, 2, Sidney-street, Cambridge:—

Bolton Bros.	£14,890 0 0
Swann Bros.	14,000 10 0
Ford	13,476 0 0
Coulson & Lofts	13,356 0 0
Trueman	12,345 0 0
Wallace & Innes	11,152 10 9
Jones & Sons, Neath and Cherry-hinton, Cambs.*	10,464 5 6
Saunders & Saunders	7,067 13 0

COLWYN BAY (Wales).—For supplying and laying tar or asphalt pavements, for the Urban District Council. Mr. Wm. Jones, C.E., Council Offices, Colwyn Bay:—

	per sup. yd. s. d.		per sup. yd. s. d.
D. Grundy	3 6	J. Inkerman Payton	2 3
Asphaltic Limestone Co.	3 6	F. A. Drake	2 0
Constable & Co.	2 8	North of England Asphalt Co.	1 11
W. H. & E. Stainsbury	2 6½	W. & A. Higginbottom, Manchester*	1 6½
East Acton Tar Paving Co.	2 6	F. Sheeren	1 6
W. Shepherd	2 6	Hughes & Evans	1 6
La Brea Asphalt Co.	2 3		

COLWYN BAV.—For laying a water main (1,850 yards), Conway-road to Rhos, for the Urban District Council. Mr. W. Jones, C.E., Council Offices, Colwyn Bay:—

B. C. Farmer	£369 11 6	Hughes & Rowlands, Colwyn Bay*	£206 14 0
W. Westwood	321 18 0	Thos. Rowland	204 9 0
R. D. Hughes	222 0 0	Calder & Evans	163 11 8
Mooney & Co.	216 10 6		
Parry & Jones	212 14 0		

FRIMLEY (Surrey).—For the erection of a sanatorium for consumptives for the Brompton Consumption Hospital. Mr. Edwin T. Hall, architect, 54, Bedford-square, London, W.C.:—

Higgs & Hill	£65,450 0	Laurence & Son	£57,362 0
W. Watson	63,193 0	Leslie & Co.	57,250 0
Foster & Dicksee	61,166 0	Shillitoe & Son	57,000 0
The Haslemere Builders	58,622 12	Holliday & Greenwood*	55,255 0

GLASHEEN (Cork).—For additions, &c., to Peterborough cottage, for Mr. R. Young. Messrs. W. H. Hill & Son, architects, 28, South Mall, Cork:—

John Kearns, Fish-street, Cork* £330

GRIFFITHSTOWN (Wales).—For the erection of road works, Windsor-road, for the Panteg Urban District Council. Mr. Jas. Wallace, surveyor, Sunny Bank, Griffithstown:—

P. Chapman, Wainfellan, Pontypool £150

HERTFORD.—For roadworks. Mr. John H. Jevons, Borough and Waterworks Engineer and Surveyor:—

Felkin & Watson	£991 7 7	A. Catley	£756 11 0
Norris & Son	931 13 0	Wallace & Inns	759 19 0
G. Tomlinson	869 0 0	Free & Sons	726 16 0
T. Adams	852 16 0	E. R. Kemp, Hertford*	707 18 6
S. Kitteringham	814 13 4		

HERTFORD.—For laying water mains. Mr. John Hy. Jevons, Borough and Waterworks Engineer:—

A. T. Catley	£793 5 6	Rayment & Son	£648 14 4
Soan	789 12 2	G. Tomlinson	644 13 3
S. Kitteringham	779 17 7	W. H. Hinkins	588 19 0
Ekins & Co.	687 15 3		

HUNSTANTON.—For new house at Hunstanton, for Mr. H. J. Finch. Mr. H. J. Green, architect, 31, Castle Meadow, Norwich:—

John Cracknell	£1,884 6 0	Chambers & Son	£1,670 0 0
F. Giddings	1,821 12 9	Reuben Shanks, Chatteris, Cambs.†	1,650 0 0
P. Bamyard	1,813 7 10		
F. Southgate	1,748 0 0		

ILFRACOMBE.—For St. Peter's New Church, Ilfracombe, Devon. Mr. Geo. H. Fellowes Prynne, architect, 6, Queen Anne's-gate, Westminster. Quantities by Mr. R. Henry Hale, 33, Old Queen-street, Westminster, S.W.:—

W. Wiffen	£10,796 17 0½	F. J. Reed	£9,866 5 7
Stephens, Rastow, & Co.	10,692 3 4	Willcocks & Co.	9,583 6 0
W. Dart	10,352 0 0	G. Bowen	8,814 17 1
Luscombe & Sons	9,992 0 0	Britten & Pickett, Ilfracombe*	7,531 8 8

KINGSBURY.—For Sewerage Contract No. 1, for the Urban District Council of Kingsbury (Middx.):—

	Wraggs or Suttons Pipes, of a thickness of ⅛th of the Internal Diameter.	Hamblette Ironware Pipes.	Wraggs or, Suttons Pipes of a thickness of ⅛th of the Internal Diameter.
Meston & Hale	£9,481 10 7	£9,253 0 4	£9,253 0 4
R. Ballard, Ltd.	9,059 0 0	8,947 0 0	8 897 0 0
T. Adams	9,031 12 3	8,852 12 3	8,852 12 3
J. Dickson	9,037 17 10	8,793 16 4	8,793 16 4
Killingback & Co.	8,302 11 2	8,044 7 11	8,044 7 11
John Jackson	7,828 18 7	7,653 16 1	7,653 16 1
Clift Ford	7,697 0 0	7,532 0 0	7.532 0 0
J. A. Dunmore	7,188 17 10	7,030 4 9	7,030 4 9
Green & Co.	7,063 0 0	6,930 10 0	6,877 10 0

[Engineer's estimate, £8,055 4s. 7d.]

LEEDS.—For alterations to the Priory, Cumberland-road, Headingley. Messrs. G. F. Danby and E. M. Simpson, architects, 10, Park-row, Leeds:—

Brick and Stone.—M. Wilson, Moor-road, Headingley*	£750 0
Joinery.—T. Harrod, Craven-road, Leeds*	455 0
Slating.—Atkinson & Son, Leeds*	57 0
Plumbing.—J. W. Vine, Leeds*	194 15
Plasterine.—Pennington & Sons, Leeds*	108 0
Painting.—Dykes & Son, Leeds*	31 14

LONDON.—For decoration, &c., in offices, 85, Gresham-street, E.C. Messrs. George Baines & R. Palmer Baines, architects, 5, Clement's Inn, Strand, W.C.:—

Battley, Sons, & Holness	£168	Lascelles & Co., 121, Bunhill-row, E.C.*	£137
Collingwood & Co.	148		

LONDON.—Addition of new vestries, heating chamber &c., to St. Peter's Church, Streatham. Mr. Geo. H. Fellowes Prynne, architect, 6, Queen Anne's-gate, Westminster. Quantities by Mr. R. Henry Hale, 33, Old Queen-street, Westminster, S.W.:—

Smith & Son	£2,394	Lorden & Son	£2,144
Goddard & Sons	2,200	F. G. Minter	2,127
J. & C. Bowyer	2,168	C. Ansell, Lambeth*	2,121

MAPPLEWELL (Yorks). — For the erection of two houses, shops, &c., Four Lanes End, for Mr. John Stevens. Messrs. Crawshaw & Wilkinson, architects, 13, Regent-street, Barnsley:—

Excavating, Masonry, and Brickwork.—Turton & Field, Stairfoot	£375 0 0
Carpentry and Joinery. — J. Hall, Stairfoot	119 5 0
Slating. — W. Scholey, Doncaster-road, Barnsley	33 2 0
Plumbing and Glazing.—B. S. Ledger, Staincross, Barnsley	19 14 4
Plastering.—Miss Fleming, Eastgate, Barnsley	30 5 0
Painting.—A. Turner, Mapplewell	10 0 0

NETHERFIELD.—For erection of three houses, Godfrey-street, Netherfield, Notts. Mr. H. Allcock, architect, Wheeler Gate, Nottingham:—

Fletcher	£890 0	J. Lewin	£775 0
W. & J. Simons	855 0	T. & W. Lee	765 0
Deabill	820 0	Geo. Tegerdine	700 0
Harper	808 0	Brooks Bros.*	621 16

NOTTINGHAM.—For the erection of stationers' warehouse, Woolpack-lane, Nottingham. Mr. H. Allcock, architect, Wheeler Gate, Nottingham:—

Dennett & Ingle	£1,400 0	F. Messom	1,278 0
J. G. Thomas	1,377 0	Crane & Co., Ltd.	1,277 0
J. Shaw	1,285 9	Williamson & Co.*	1,277 0

SALISBURY.—For new shop and premises, Blue Boar-row. Mr. Alfred C. Bothams, architect, Chipper-lane, Salisbury:—

Vincent & Follard	£2,230	Young Bros.	£2,035
Wort & Way	2,098	Dawkens	1,985
Kite	2,116	E. Hale, Castle-street*	1,980
Hains Bros.	2,075		
Mitchell	2,059		

S. COLOMB MAJOR.—For restoration of S. Colomb Major Church, Cornwall. Mr. Geo. H. Fellowes Prynne, architect, 6, Queen Anne's Gate, Westminster. Quantities by Mr. R. Henry Hale, 33, Old Queen-street, Westminster, S.W.:—

Willcocks & Co.	£6,198 7 4	J. Colliver	£4,119 2 7
J. C. Lang	4,545 7 11	Hobbs & Son	3,690 0 0
S. Trehane	4,486 13 4	W. Wiffen, Holsworthy*	3,615 1 3
W. Dart	4,188 0 0		

[The tower, and new vestry work not to be executed at present.]

SHEFFIELD.—For lych gate and boundary walling to the Brightside Churchyard, Brightside, Sheffield, for the Rev. B. L. Parkin, M.A., Vicar of Brightside. Messrs. Hall & Fenton, architects, 14, St. James'-row, Sheffield. Quantities by the architects:—

Martin & Hughes	£427 0	Wilkinson & Sons	£322 10
G. Malpass	380 15	W. Ainsley	293 4
A. Bradbury	373 0	J. S. Teanby*	286 0
T. Ireson	344 0	M. Hancock	267 0
T. Astling	334 0	M. A. Earl	265 0
H. White	328 0	[All of Sheffield.]	

SHEFFIELD.—For alterations and additions to Nos 50 and 52, Sheffield-moor, for Messrs. the Trustees of the late Jno. Spafford. Messrs. Hall & Fenton, architects, 14, St. James's-row. Quantities by the architects:—

Dyson, Son, & Gregory	£2,059 10	J. H. Lilleker	£1,954 0
J. Musson	2,025 0	C. H. Gillum	1,950 0
Ash, Son, & Biggin	2,015 0	T. Margerrison	1,870 0
F. Turner	1,979 0	G. Portass	1,810 0
Mastin & Son	1,959 0	G. Allen, Bolsover-street*	1,729 0

[All of Sheffield.]

SHEFFIELD.—For rebuilding "The Light Horseman" public-house, Penistone-road, Sheffield, for Messrs. the Directors of Thomas Rawson & Co., Limited. Messrs. Hall & Fenton, architects and surveyors, 14, St. James-row, Sheffield. Quantities by the architects:—

Dyson, Son, & Gregory	£1,255 0	F. Turner	£1,137 12
Mastin & Son	1,221 0	T. Margerrison	1,110 0
A. Bradbury	1,175 0	J. Masson	1,074 0
J. H. Lilleker	1,174 0	E. Moore	1,032 0
Abey & Son	1,144 13	Geo. Allen, Bolsover-street*	1,007 0

[All of Sheffield.]

SHENFIELD.—For residence at Shenfield, Essex, for Mr. H. H. Keddell. Messrs. George Baines and R. Palmer Baines, architects, 5, Clement's Inn, Strand, W.C.:—

S. T Scott	£2,450	Battley, Sons, & Holness	£2,193
G. T. Hosking	2,424	Brown & Son	2,192
T. Chessam & Sons	2,420	Hammond & Son	2,189
Turtle & Appleton	2,346	F. & H. F. Higgs	2,152
A. & T. Cross	2,314	E. West, Chelmsford*	1,983
Johnson & Co., Ltd.	2,279		

* Accepted with slight additions.

SWANSEA.—For the erection of house, Mirador Estate, Swansea. Mr. Glendinning Moxham, architect, Swansea:—

John Davies	£1,580	Lloyd Bros.	£1,450
David Jenkins	1,550	Walters & John	1,410
Bennett Bros.	1,550	Henry Billings	1,350
Griffith Davies	1,500	J. & F. Weaver*	1,330

SWANSEA.—For the erection of convalescent home, Cwmdonkin, Swansea. Mr. Glendinning Moxham, architect, Swansea:—

Goodridge & Son	£4,985	J. & F. Weaver	£4,655
Lloyd Bros.	4,909	Henry Billings	4,560
Thomas Richards	4,872	Walters & John	4,266
Bennett Bros.	4,777	Thomas Davies	4,266
D. Jenkins	4,735	John Williams	4,160
Marles & Son	4,715	Griffith Davies*	4,047
John Davies	4,672		

WEST HAM.—For the erection of a block of school buildings and appurtenances, to be known as the Napier road Schools, in the County Borough of West Ham, for the West Ham School Board. Mr. William Jacques, Architect to the Board, 2, Fen-court, E.C. Quantitie by Messrs. R. L. Curtis & Sons:—

Holliday & Greenwood	£29,297	W. J. Mattison	£27,158
W. Gladding	28,935	Stimpson & Co.	27,150
A. E. Symes	28,850	G. Sharpe	26,920
A. Reed	27,870	Gregar & Son, Stratford*	26,486
Battley, Sons, & Holness	27,772		

* Accepted subject to the approval of the Board of Education.

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect:—

* *Recommended for acceptance.*

GREENWICH.—"Slade" manual training centre for twenty (with extension to forty):—

F. & H. F. Higgs	£1,139 0	J. & C. Bowyer	£897 0
W. Downs	1,055 0	Marsland & Sons	893 0
Johnson & Co.	1,020 0	E. Triggs	583 0
Smith & Sons, Ltd.	964 0	Kirk & Randall	878 0
Bulled & Co.	957 0	Thomas & Edge	852 10
Garrett & Son	920 0	T. D. Leng*	824 0

GREENWICH (Haseltine-road).—Enlargement. Extending low-pressure hot-water apparatus to three new corridors on ground, first, and second floors:—

Werner, Pfleiderer, & Perkins, Ltd.	£153 6 6	J. Esson	£123 0 0
Kite & Co.	135 0 0	Palowkar & Sons	114 10 0
Knight & Sons	128 0 0	Bates & Sons*	99 10 0

[Provision of £117 included in contract for enlargement.]

HACKNEY (Chisenhale-road).—(Enlargement)—Boys, 48; girls, 48; infants, 48. Total, 144, with additional cloak-rooms for each department:—

Willmott & Sons	£2,725	Miskin & Sons	£2,522
Gregar & Son	2,677	F. & F. J. Wood	2,513
Chessum & Sons	2,651	Lawrance & Sons	2,491
Snewin Bros. & Co.	2,635	J. & M. Patrick	2,454
Shurmur & Sons, Ltd.	2,583	C. Cox	2,439

Treasure & Son, London and Shrewsbury* £2,387

MARYLEBONE (Haverstock Hill).—Special school; three rooms of twenty each:—

Gough & Co.	£4,264	C. Cox	£4,068
McCormick & Sons	4,245	Williams & Son	3,882
Dearing Son	4,217	Lawrance & Sons	3,843
Willmott & Sons	4,150	Simpson & Son	3,752
Grover & Son	4,142	Stimpson & Co.	3,714
L. H. & R. Roberts	4,135	Treasure & Son	3,692
Marchant & Hirst	4,118	E. Triggs*	3,553
Wall & Co.	4,118		

MARYLEBONE (Mansfield-road).—Special school for mentally defective children. Enlargement, two classrooms of twenty each:—

Wall & Co.	£1,480	C. Cox	£1,375
Marchant & Hirst	1,444	Dearing & Son	1,336
Treasure & Son	1,431	Willmott & Sons	1,312
General Builders, Ltd.	1,408	Williams & Son	1,306
McCormick & Sons	1,389	Lawrence & Sons*	1,270

[See also next page.

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Supply of TIMBER for use in Carving Classes, on a running Contract:—

Timber (planed on one side only).	Burton, Brine, & Read, Ltd.	G. & T. B. Cobbetts.	Hahn & Co.	J. F. & G. Harris	Ingram, Perkins, & Co.	W. J. Latchford	J. Latham, Ltd.	London School Furniture Co.	Mallinson & Co.*
	d.	d.	d.	d.	d.	d.	d.	d.	d.
1-in. Yellow Pine (in 8-ft. lengths).....per ft. super.	4½	5	—	6	5	—	6½	4½	4
¾-in. " " " " "	3½	4½	—	5	4	—	5½	3⅝	3
1-in. Bass or American Whitewood (good green colour) "	2¾	2⅞	†3½	5	3½	3½	3⅝	4	3½
¾-in. " " " " "	2½	2½	†3¼	4	2¼	—	3½	3½	3
1-in. Oak (not less than 6 in. wide) ..... "	4½	3½	‡6	11	4½	5	4½	4½	4½
¾-in. " " " " "	4	3½	‡5	8½	4½	—	3⅝	4	3½
1-in. American Walnut (not less than 9 in. wide) "	7½	7½	‡8	13	10	10½	9½	11	9
¾-in. " " " " "	6½	7¼	‡7½	10	8	—	8	9½	7½
1-in. Satin Walnut (not less than 8 in. wide) "	2½	3½	‡3½	—	3½	4	3⅝	4½	3½
¾-in. " " " " "	2½	3	‡3½	—	2½	—	3⅝	3½	3

† Planed on both sides. ‡ Unplaned.

HAMMERS (coal, small), DRAIN SCOOPS (old and new patterns), and TIN LANTERNS:—

—	Small Coal Hammers. per dozen.	Drain Scoops (old pattern). each.	Drain Scoops (new pattern) 5½ in. each.	Drain Scoops (new pattern) 5 in. each.	Drain Scoops (new pattern) 4½ in. each.	Drain Scoop (new pattern 3½ in. each.	Tin Lanterns. each.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Bird & Co.	12 0	*3 6	3 0	2 11	2 10	2 6	2 3
Braby & Co., Ltd.	—	4 0	*2 10	*2 9	*2 8	*2 7	—
R. H. & J. Pearson, Ltd.	*11 9	—	—	—	—	—	*1 8½

WEST LAMBETH (Stockwell-road).—Improvements. Providing and fixing complete low-pressure hot-water apparatus to three halls, nineteen classrooms, corridors, cloakrooms, and lavatories; also providing auxiliary apparatus to classrooms (all boys', girls', and infants'), including cutting-out and altering the existing low-pressure apparatus:—

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Comyn Ching & Co., Ltd.	697 10	Duffield & Sons ..	530 0
Turner & Co.	692 0	The Brightside Foundry and Engineering Co., Ltd.*	517 0
Price Lea & Co..	665 0		
Oldroyd & Co., Ltd.....	619 0		

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Cartwright & Son....	4 16 0	12 18 4*	3 0*
Cox & Son, Ltd.	5 14 0	14 11 8	3 9
Goodall, Lamb, & Heighway, Ltd.....	6 6 0	17 8 8	4 1 53/100
Lawes & Co.	6 12 0	17 10 0	4 3

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VOL. LXXXII.—No. 3092. MAY 10, 1902.

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Buccleuch Memorial, Edinburgh ..... Dr. Rowand Anderson, Architect.
"Foxcombe," Oxfordshire ..... Messrs. Ernest George & Yeates, Architects.
Oak Reredos, Church of St. Thomas-at-Cliffe, Lewes ..... Mr. Thos. Garratt, Architect.
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The Royal Academy.

It is not a comfortable reflection, to the patriotic mind, that we should be obliged to confess that what distinction there is in this year's Academy Exhibition is mainly owing to the work of an American-born artist educated in Paris. But so it is. As an English artist—not a painter—candidly observed, "Without Sargent, where would the show be?" Of Mr. Sargent's two trio portrait groups, that in Gallery II. and that in Gallery IV., the critics seem to have thought it right to express a preference for the indoor group in Gallery IV.; why, one cannot imagine, except that to express a preference for the less obviously striking of two pictures implies that the critic has a fine-drawn standard of his own, entirely apart from the judgment of the crowd. But in this case we think that the crowd, which unquestionably prefers the picture in Gallery II. "The Ladies Alexandra, Mary, and Theo Acheson" (89), is in the right. The picture is a triumphant success; it impresses one as Reynolds *redivivus*, with even something added. The three ladies are grouped, two standing and the centre one seated, around a stoneware vase of heroic proportions, from which springs an orange tree, some of the fallen fruit of which forms an incident of colour in the foreground. The ladies are in white, save that a striped sash of black and white plays around one of them; like the vase they are of heroic proportions (in height); they are certainly abnormally tall, but this may be accounted a noble error, since it adds to the grandeur of the picture. Painters complain that the faces of the standing figures could not show light against the sky; but we deny that they do so; they are quite sufficiently detached from the background. There is a great style about the whole work, such as perhaps no other portrait painter of the day can give; it may be admitted, perhaps, that for an open-air group it is not an orthodox *plein-air* picture; but we can forgive that, when we remember for what crudities of colour and texture *plein-air* has been responsible. The other portrait group, "The Misses Hunter" (229) shows three ladies seated in an interior, two in dark and one (the one in shadow) in white raiment; this also is a very fine picture, but not with the overpowering brilliancy of the other. Exceptionally beautiful too, is the same artist's single-figure portrait of "The Duchess of Portland" (323), standing by a sumptuous white marble chimney-piece, in evening dress with a crimson opera cloak; a portrait *de luxe*, more highly finished (in the superficial sense) than is usual with the artist, but quite captivating in its way. As a pendant to this is judiciously hung M. Carolus Duran's portrait of "Mrs. C. S. Henry" (327). It is curious to compare the two. The French artist undoubtedly paints hands and face with greater completeness and finish (though in the present instance Mr. Sargent has bestowed more trouble than usual on the hands of his sitter), but his colour is duller and more conventional—in this example at least; and in effectiveness and power there is no doubt that the American artist, who was we believe a pupil of the French one, forces his former master into the second place.

Though the great pictures of the year are portraits, beyond them portraits are neither more numerous nor more remarkable than usual. Mr. Fildes's large portrait of the King—a "State" portrait and hung in State surroundings, is necessarily too prominent to escape notice, but is not otherwise very noticeable. It is of course difficult to make anything very recondite out of a showy uniform and other trappings; there are painters, however, who could have made such a work less hard and commonplace than this; but the English court has almost always avoided employing artists of too independent genius, and this inherited prejudice seems to be kept up in the present reign. There are some very good portraits beyond those we have mentioned, but hardly any great ones. Mr. Orchardson's portrait of Mr. Asher (10) is in his best way; an ostensibly realistic portrait lifted out of commonplace by its subtleties of colour. M. Benjamin-Constant's portrait of Mrs. Walter Parrott (107), like the examples at the Grafton Gallery mentioned last week, is hard and brilliant in character, and more remarkable in the painting of the costume and accessories than in that of the face of the sitter. Sir L. Alma-Tadema's half-length of the High Sheriff of Surrey (171) is a highly-finished work in his peculiar and rather enamelled style in portraiture; Mr. G. F. Watts's head of General Baden-Powell (177), on the other hand, is one of those simple and unpretending portraits in which he seems nevertheless to give the essential aspect and character of the sitter. Mr. Sargent's full-length of Lord Ribblesdale (175) seems to have been suggested by Mr. Whistler's Comte Montesquieu-Fésenzac; and, like that curious though remarkable work, is too tall in its proportions. Mr. Shannon has given a charming air of poetic conception to his portrait of Lady Marjorie Manners (202), a picture rather than a portrait; while in his likeness of Mr. Phil May in hunting costume he seems, on the other hand, to have aimed at a prosaic realism which suggests a suspicion of caricature, or as if he wished to assimilate the likeness of the artist to the character of the studies of the lower order types for which he is famous; Mr. Phil May treated "*en* Phil May"; it is not an engaging work to look at. Mr. Ralph Peacock has painted a sufficiently faithful portrait of Mr. Holman Hunt—it hardly draws further praise; and Mr. Frank Bramley has struck an original vein in his *laissez-faire* portraiture of "Mr. and Mrs. Chalmers" (482), the gentleman blowing a match in his hat to light his pipe while the lady looks on; a clever picture which looks, perhaps, a little too humorous for a portrait, but is at all events full of life.

The President, Sir L. Alma-Tadema, and Mr. Orchardson may be said to divide the honours of the large room. Sir E. Poynter's small picture, "Storm Nymphs" (149), shows a wreck, around which and its spoils three nude nymphs are sporting, human in appearance, but we presume not to be taken as humans in any other sense. The picture

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is a masterpiece of figure drawing, the foreshortened figure of the recumbent nymph nearest the foreground especially; but it strikes one that the reflection from the rug on which she lies (part of the spoils of the wreck) has tinged her side with rather too heavy and heated a tone for nude flesh even in this light. However, the picture is a masterly piece of art; it means nothing, it tells no tale; it is *L'Art pour l'Art* simply, and from that point of view is a most complete and satisfactory production. Sir L. Alma-Tadema's one work, hung in the usual place, is even smaller in scale than usual; it looks as if the painter had been thinking of emulating Meissonier in minute finish. It represents "Caracalla" (201) entering possibly his great Thermæ, or it may be his palace, through an entry with bronze folding-doors whose patina is most subtly indicated; he walks over a mosaic floor not laid in any pattern, but still a joy to the eye from the perfect way in which it is represented; before him are kneeling couples of maidens to keep his path strewn with flowers; at the entry, in bright sunlight, are one or two gaily-clad figures of his suite; in the background a vista of marble columns, railings, &c. The whole is a perfectly finished momentary glimpse into the life of Imperial Rome; a revival in which not a detail seems forgotten. Mr. Orchardson's picture "The Borgia" (190) is a somewhat unusual one for him; the scene is that of an outdoor banquet in an Italian garden, under pines whose heavy masses of foliage fill up the top of the picture and seem to lower portentously over the scene below, where a guest falls forward on the table poisoned, "The Borgia" looking on; apparently the other guests have had the good taste to feel the incident an embarrassing one, and have fled the feast, or possibly they dreaded the further circulation of the poisoned cup. This is a remarkable picture, and grows upon one, although the story is but a commonplace; not only has it all the subtlety of colour which is never absent from Mr. Orchardson's works, but there is a kind of sinister terror about the whole aspect the scene which harmonises with the idea of the crime represented. There are many fine points in the execution of the details, and altogether it is a work worthy of the artist's high reputation.

Of other subject pictures there are not many to attract those who look at Exhibitions mainly from the point of view of art, though there are plenty for the public who go to look at pictures as anecdotes, and many of them indeed poor enough; pictures in which there is no recognisable motive except that of producing a marketable article. Among the few which may take a higher stand than this are Sir W. Richmond's stately picture of "Hera in the House of Hephaistos" (126), and Mr. Dicksee's "La Belle Dame sans Merci" (13), which is however a not very new rendering of a legend much hackneyed in painting; it is sufficiently expressive but rather heated in colour. Mr. Briton Riviere's "Aphrodite" (37) is mainly an excuse for painting a collection of animals following the goddess, who is no goddess, but a modern young woman of blonde Scottish type, masquerading as Aphrodite. Mr. Solomon's "Psyche" (118) is another example of the reduction of a poetic legend to materialism; his Psyche is merely a clever nude study, with no idealism of any kind about it. Mr. John Collier's "A Confession" (320), meant to be a moment of pathetic interest in modern life, does not tell its story; which of the two is confessing? It is impossible to say. Mr. Tuke's "The Run Home" (392) is but a feeble and thin representation of yachts and their navigators, but in "Ruby, Gold, and Malachite" (739), boys bathing in a sunlit sea, he is himself again, and has produced a bright and delightful picture. Mr. F. D. Millet's "Proclaiming the King" (468) is a scene in some loyal village, a large work painted to be popular during the present season, and which shows most careful and conscientious study of the various heads in a crowd of people; in this respect the work deserves all praise, but we cannot say that it interests us particularly. "Napoleon's Abdication" in the same room, by Mr. Eyre Crowe, is we should think about the worst Napoleon picture ever painted; there is not even the slightest suggestion of Napoleon in the figure which, according to the subject of the picture, must be intended for him; it might be labelled "Puzzle: To find Napoleon."

Among smaller and more unpretending works which have an intellectual or artistic interest a good many might be named; works which the general public pass over with little notice, but which are of more real interest than many of those dealing nominally with more important subjects. Among these are three of Mr. Wetherbee's idylls, in which a single figure or group gives the human note, as it were, to a landscape; these are numbered 354, 360, and 706; the latter, "When the Heart is Young," a little rural love scene in one corner of a quiet landscape, the sky crossed by a few thin trees, is a beautiful little work. Mr. Lybaert, in his "Madonna of Ghent" (22), repeats his experiment of last year, of a mediæval figure backed by a suspended curtain of very rich embroidery very realistically painted; but the scheme is less effective when repeated than it was at first sight. Mr. La Thangue, in "Goslings" (50), repeats also a former favourite incident of geese (or goslings) straggling through flecks of sunlight; but this is a touch of nature's picturesque which does not tire so much by repetition. Mrs. Hunter's "Seekers: Where Shall Wisdom be Found?" (94), an interior group of an old man poring over books and a child with her doll, besides being an effective piece of painting, is a picture which suggests a thought, as so many do not. Mr. Boughton's "Tanagræan Pastoral" (160) is pretty, but hardly antique in spirit. Mr. Robert Fowler shows a fine feeling for colour in his "Sleeping Nymphs Discovered by a Shepherd" (193). Mr. Orchardson's small scene "The Story of a Rose" (221), without telling the story, suggests a whole one-volume novel. Mr. John Collier's "The Plague," a large picture, in which a lady in rich attire lies apparently dead on the floor, does not sufficiently explain the action of the man in the scene, and is hardly interesting in an artistic sense. Mr. Dollman has hit upon a new kind of incident in "Kismet" (412), where a man with a staff has fallen dead or exhausted in the desert, and is watched by self-interested vultures; not a pleasant picture, but a somewhat tragic one. Miss Kemp-Welch, in "The Morning" (233), shows a trooper dead on the veldt, with his horse standing over him; here also the tragedy of the situation is well and seriously conveyed; her other horse picture, "Ploughing on the South Coast" (264), is not very interesting; nor is Mr. Stanhope-Forbes's "Lighting-up Time" (40) equal to the best mark of his previous works. Mr. Arthur Wardle's "A Sea-monster" (55) is a clever study of a sea-shore scene, especially in the treatment of the wet seaweed in the foreground.

There are many landscapes at the Academy; many pretty ones, several which give very good studies of special effects, such as Mr. Farquharson's snow scene on a winter's night, in Gallery I.; a very successful piece of realism. But realism is not landscape art. Mr. Leader continues diligently to paint his hard and carefully-finished scenes, which look (some of them) as if you could walk into them; dear are these to the public, for that is exactly the kind of landscape painting they can appreciate. Mr. David Murray began by being, or promising to be, a real landscape artist; we remember a wide field of his with a great expanse of sky over it, which represented some of the finest qualities of the art; it had scale, breadth, and concentration of purpose. But he has not carried out this promise; and without being as hard and mechanical as Mr. Leader, he paints only scenes as they are; pretty bits, in which all is scrappy and devoid of dominating motive. That is the weakness of English landscape painting at present; there is a great deal of pretty and picturesque painting, but an entire want of a great style in this branch of the art. Mr. Alfred East last year did rise to a style in one at least of his landscapes at the Academy, and in one that was at the Salon, but he has not kept up to the same level this year. Mr. Farquharson has got a striking natural scene in his "Mountains rough with Crags" (250), but it does not impress us more than with the feeling that it must be a very good and careful representation of the place; we do not get further than that. Mr. H. W. B. Davis belongs rather to the company of painters of pretty landscapes, but then he is never hard, and he puts a sentiment into them; nevertheless, his "Autumn Evening" (68) impresses one as somewhat weak in conception and execution: his "Chartley" (196), with some finely painted white cattle, is the better though perhaps the less generally attractive work. As to Mr. Parsons's "Poplars" (17), it is the type of conventional landscape painting; a made-up-effect, like a landscape in a play. The only landscape of the year which has really a great style about it is that by the last new Associate among landscape painters, Mr. Corbet. His "Sunrise" (418), seen among marshy ground in Italy, with the chain of the Apennines (we presume) as a distance, is not nearly so beautiful or striking in its natural features as many other landscapes in the gallery; it is the treatment that does it, and wherein this consists is indeed difficult to define in words; but it is to be felt by those can look at landscape as something more than a mere imitation of nature; it is a scene treated as a whole and with an eye to total effect, not to mere detail; it is a work with style. Among clever landscapes with a less serious aim are Mr. Macarthur's "Worcestershire" (298), an apple orchard dappled with sunlight, and Mr. La Thangue's "Marsh Marigolds" (74). Then there is

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Mr. Mark Fisher's "Wayside Pond" (103), which has all the fine characteristics of style that have always distinguished his work, but we wish he would bestow his fine talents and artistic sense on more important subjects, instead of almost throwing them away on angles of lanes and ponds.

In sea-painting things are very different; there the English school may rightly be proud of its productions, which are unequalled in any other country; the French, who perhaps beat us in every other field of art, are nowhere beside us in sea-painting. Mr. Hemy is at his best in his two principal works, "The Pilot" (178), and "The Crew" (326); the latter represents a boat in a heavy sea with those of the crew who have been able to escape from the foundering ship; apparently they have left two of their number to drown, but it is easy to understand that they cannot put their boat about when running with one sail before such a sea. What one does not understand so readily is the scale of those two figures in comparison with the wave coming after the boat; surely they are somewhat too small in scale. Mr. Wyllie has painted a large picture of pure sea and nothing else—"A Whole Gale of Wind" (239) showing its effect on the shore breakers: the sea has that greenish tint which another painter, Mr. Shaw, affected in all his paintings, and which is often seen in rough weather in the neighbourhood of sandy beach. We prefer however a picture from Mr. Wyllie with ships in it, because he understands them so well. Mr. Hook's "Where the Green Sea Meets the Shingle" (187) is beautiful and fresh in colour, but a little wanting in force in comparison with many of his former achievements. Mr. J. R. Reid may be classed among the sea-painters, for the real interest both of "A Baby Crab" (72) and "The Pilots Peepshow" (381) lies in the iridescent treatment of the sea surface—perhaps a little overdone, but at all events it is full of life and colour. Mr. Peter Graham's "Where Only Sea-birds Roam" (144) would of course take rank as one of the leading sea-pieces if we had not seen the same effect and colouring so often before. Painting, treated in this way, with constant repetition, becomes really a kind of acquired sleight of hand, and loses its quality of art.

Of the sculpture (not very remarkable this year) we will say something on another occasion.

RECENT FIRE LOSSES.

DURING the last fortnight London has been a scene of several catastrophes due to outbreaks of fire. Two of these involved loss of life, two solely loss of property. Regarding fires involving loss of life, we refer to the outbreak at Hackney and the outbreak at St. Luke's. Regarding fires involving loss of property, we refer to the serious loss at the Barbican on April 21 and at the Docks on May 5. From the architect's point of view the Hackney fire and the Barbican fire are the two of primary interest, the Hackney fire affording us an example of loss of life through deficient planning and construction, and the Barbican fire affording us an example of the additional risk incurred by a lack of preventive measures.

Dealing first with the Hackney fire, we find the unfortunate arrangement of a building set back from the frontage line of the thoroughfare with the intervening space covered by a shop. The approach to the house was by a passage on one side of the shop, separated only by a light, inflammable partition. Any outbreak of fire in such a shop necessarily makes this passage impassable and the house becomes a mere death-trap, for not even the ordinary accoutrements of the fire brigade, such as a fire escape, can be brought into use under circumstances of this description.

For new legislation it is imperative that precautionary measures should be insisted upon for the class of building involved in the Hackney fire. The entrance and exit of the house should be constructed of fire-resisting materials, and there should be no connexion whatever between the house and the shop, the upper floors of the house also being separated from the shop by a fire-resisting floor of substantial construction. Such safeguards are already law as far as new stables are concerned, but we believe the sanitary question was put forward for that class of structure rather than the risk from fire. There are also several other classes of building where partial separation is already compulsory. New legislation, however, should not only make these safeguards compulsory for a new building, but retrospective, and landlords should be compelled to protect their property in such a manner that the risk of loss of life is limited. The requirement of such protection being afforded in old buildings would not be at all unreasonable if ample notice were given and, say, a period of three or five years were allowed in which the additional protection would have to be provided.

In respect to the great Barbican fire, we will, in the first place, point to our previous articles in connexion with the Cripplegate fire of November, 1897, and at the same time mention that much that we suggested at the time has been taken up, not only by the British Fire Prevention Committee, whose business it is to put forward new ideas in respect to fire protection, but also by the London County Council and by some of the more progressive fire insurance offices. As a matter of fact, the Barbican fire of last month does not give us really any new features from an architect's point of view. There are no features to which we can point that were not already mentioned in connexion with the Cripplegate catastrophe. The character of the property was identical, the effect of the fire was identical, and perhaps the only point at which we would express our surprise is that the fire—no matter how exposed some of the windows of the buildings on the north side of Barbican may have been—was allowed to spread from the south side to the north side over a thoroughfare 47 ft. wide. Whether the wind had anything to do with this, whether the fire brigade was at fault (as many of the underwriters think), or whether a combination of unfortunate circumstances increased the severity of this fire, we know not, and it would perhaps be premature to say anything pending the fire inquest which has been ordered at a recent meeting of the Common Council.

One thing, however, was more evident at the Barbican fire than at the Cripplegate fire, and that was, in the first place, the large proportion of unprotected vertical glazing alluded to in a letter in a recent number, and the fact that, although of recent date, none of the buildings had their iron columns or girders protected by plaster or concrete.

One can hardly speak too strongly as to the neglect shown in the erection of factories and warehouses respecting the protection of ironwork. The fact that no protection happened to be specified in the Act of 1894 seems to be a serious omission. Even the more enlightened of architects have failed to apply this form of protection in modern buildings of the warehouse class. The exact form of the best protective coverings cannot, of course, be stated without due consideration and careful investigation, and we have scarcely sufficient data to go upon. We understand, however, that such data will shortly be forthcoming, as the committee of experts formed in Germany by representatives of the various engineering societies and others will be taking this matter up, and, by arrangement with the British Fire Prevention Committee, will particularly deal with such parts of the subject as have not yet been dealt with in this country. Similarly, a fire prevention committee in course of formation in the United States will be taking up this same question in consultation with the London body, with particular regard to protective coverings that shall be free from the effect of corrosion and rust—a most important point which has been too much neglected. Such investigations, whether conducted in London, Berlin, or Boston, will, of course, take considerable time, but it is to be hoped that the experience gained and the experiments made will be available by the time the Building Act is again under revision.

Regarding the large vertical surfaces of unprotected glazing, we think that the simplest and most effective manner of protection would be that adopted on the Continent of providing windows on the fronts of warehouse property with the ordinary rolled shop-shutter made in hard wood or metal, and it might be a subject for the various shutter-makers to put forward for investigation, to see which of the many forms of shutters on the market are most adaptable for this purpose. We have, of course, seen tests with asbestos blinds, water-screens, water-spray curtains, and the like, and in Scotland various forms of sliding shutters are frequently used, whilst a considerable amount of protection can be obtained from different forms of fire-resisting glazing for every-day practical purposes. The rolled shutter, however, will be found to be more practical for everyday use. There is no reason why the shutter should not have some ventilation-holes, as it is only the protection against drifting sparks that has to be primarily considered. The great fear of the fire brigade is that an incipient fire would be hidden too long in a house closed up entirely by shutters. This would be obviated if some loopholes were allowed in the shutter surfaces. Of course, the use of the shutter is to a great extent dependent on the owner's careful management, as it is liable to get out of order if not regularly used and properly attended to. We believe the insurance companies have already given a slight rebate for the equipment of shutters, and that they propose making the rebate a larger one for shutters facing areas as distinct from thoroughfares. There is no reason why there should not be the double

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protection of fire-resisting glazing as well as the provision of a shutter, inasmuch as many of the forms of fire-resisting glazing are particularly adapted to areas, seeing that, besides giving a fire-resisting surface of some durability, this glazing, if used in prism section (either in sheets or in small squares) is useful in affording additional reflected light.

Touching on the question of roofs, there is no doubt that the ordinary slate roofing, found in the warehouse districts, is a source of considerable danger. Slates crack immediately when affected by heat from a neighbouring fire; the slates fall off, and the boarding below, having all the qualities of tinder, soon catches a spark and is well alight. We think that this roofing question calls for most careful attention; and although we do not favour the flat roof of solid concrete or the like, we hold that the roofing materials should be improved upon, that iron trusses should be made compulsory in the warehouse class of building, and that matchboarding should be prohibited, whilst some of the many fire-resisting materials could be applied for roofing purposes with better results than the usual Bangor slate.

It is not our intention to enter into detail. The Barbican fire, as we have said, really only forms a repetition of the Cripplegate fire. There is one point, however, for those who may be preparing the draft of the new Building Act to heed, and that is, the Building Act of the future should distinguish between different classes of buildings and should distinguish between the various zones and districts of the Metropolis. At the present moment we only have to distinguish the "warehouse class." We shall in future require several distinct classes, separating the ordinary suburban shop from the West End shop, and the latter from the warehouse and office block—again, the warehouse and office block from the factory—and the factory from the great combined stores which at times combine the requirements of shops, warehouses, and manufactories all under one roof, and also hold at times large crowds of employees and customers. As to zones, it seems illogical to treat on identical lines shop property in Hampstead or Camberwell with shop property in the West End, or shop property in Cheapside and Aldersgate-street. We believe the zone system has been applied with considerable success in some of the American cities and also in Vienna, and it might be well to study the experience gained in other localities.

In closing these few remarks on the Barbican fire, we regret to say that as long as present circumstances exist, and as long as we have no retrospective legislation regarding our buildings of a dangerous class, and again, as long as our fire-brigade establishment remains undermanned and retains its organisation of thirty years ago, we must expect from time to time repetitions of the Cripplegate and Barbican fires. We must, in fact, congratulate ourselves that these fires have, so far, always occurred singly and in propitious weather. Given two fires of this description, starting approximately at the same time on a really stormy night, the fire loss of London would indeed be something terrible.

ST. PHILIP AND ST. JAMES, MILTON.—The new north aisle for this church, which has been in contemplation for several years, is now about to be built, through the generosity of Lord Norton. The architects are Messrs. Jones & Hilton, Burslem; and the builder is Mr. J. Moss, of Milton.

NOTES.

The Education Bill.

THE second reading of the Education Bill will have taken place before the publication of this number, but not in sufficient time for us to chronicle it here. That the second reading would be carried has long been foreseen by those even who are most opposed to the Bill. Nothing that has been said in the debate has, however, altered the view of disinterested educational reformers that it would have been far better to have dealt, in the present session only with secondary and technical education. It is the necessity of providing money for primary education which will largely starve higher education, nor have we any certainty that in the rural districts the policy of many County Councils will not be to spend as little on education as possible. Several speakers in the debate this week have not thrown any new light on the question, and as with so many measures of the present day, the most important part of its Parliamentary life will be the committee stage, in which we may expect many important amendments to be discussed.

London Water Bill.

WHEN we discussed the second reading of the London Water Bill it was pointed out that this part of the proceedings of Parliament was of little importance compared to subsequent stages. Last week we noted some of the decisions of the Committee; this week a very important amendment has to be considered, that of the elimination of the representatives of the London Municipal Councils, so as to reduce the size of the Water Board. From the time the Bill was introduced, it has been quite evident that from a business point of view there were far too many members on the Board, and the Committee has certainly acted in the public interest in deciding to reduce it; and we hope that they will not next week change their decision. Nothing can be more absurd than to say that the Committee had not power to take this step. When the House of Commons passed the second reading it did no more than affirm the principle that the water companies should be superseded by a public body. All the details as to the transfer of the undertakings and the composition of the new Water Board were left for criticism and revision, if necessary. During the several years' discussion of this question we have reiterated the opinion that the London County Council was the proper body to control the water supply of London, and we feel little doubt that even if a Water Board is constituted by Parliament its powers will ultimately, and perhaps at no distant period, be transferred to the London County Council.

High-Pressure Heating Apparatus.

WE have before us the Board of Trade Reports of the preliminary inquiries in respect of two boiler explosions. The first explosion occurred on November 17 last at the Long-lane Board School, East Finchley, and the second on December 17 at the Primitive Methodist Sunday School, Barnoldswick, Yorkshire. In each case the boiler consisted of coils of pipes, and was in connexion with heating pipes on the high-pressure system. The Finchley apparatus was about eighteen years old, and had been regularly inspected by the makers until the year 1896. The explosion probably resulted from the presence of air and the formation of ice in the circulation-pipes, the flow of water being thereby obstructed, and one of the boiler-tubes being consequently overheated and so weakened that it was unable to withstand the steam-pressure to which it was subjected. A safety valve was fitted at the highest point of each set of circulation-pipes, and was therefore in such a position as to be quite useless under the conditions which led to the explosion. The Yorkshire apparatus was about twenty-one years old, but the boiler was repaired thirteen years ago, a new tube being inserted in place of one that had given way owing to the pipes having been choked with ice. In the recent explosion one of the boiler-tubes yielded on account of imperfect welding, although at the time the apparatus appears to have been working under normal conditions. It is, of course, possible that the tube had been previously strained during frosty weather. A new apparatus of similar character was, at the date of the Report, being laid down, each section being fitted with a safety valve. The engineer surveyor-in-chief suggested that the valves should be placed "where they will always be operative, and where an escape of heated water will not cause injury to any person." These explosions are fresh proofs of the dangers attending high-pressure heating apparatus.

Buildings in Advance of Building Line.

THE of the Blackpool Corporation *v.* Johnson, reported in the "Law Reports" for this month, is one of very considerable interest to the owners of property. A certain shop, house, and cellar had been erected in the borough, which, without the written consent of the Urban Authority, projected further into the street than the main walls of the adjoining buildings. Johnson, the respondent in this case, had purchased the building from the owner and builder, who had become bankrupt. The Urban Authority then proceeded against the respondent under Section 3 of the Public Health (Building in Streets) Act, 1888, contending that under that Section he was committing a continuing offence by allowing the building so to continue, for which he was liable to the penalty of 40s. a day. The Court unanimously held that the magistrates had been right in refusing to convict the respondent in such circumstances, as by the terms of the section the only person liable to the penalties for continuing the offence was the person who had committed it, *i.e.*, who had erected or brought forward the house beyond the building line. Conversely under Section 158 of the Public Health Act, 1875, which makes the existence of works which infringe by-laws of Urban Authorities and which are erected without the approval of the Urban Authority a continuing offence, it has been held in "Welsh *v.* West Ham Corporation" that the person liable in respect of the continuing offence must be the person actually continuing it. In this case the builder, who was not the owner and who was not in possession of the building, was held not guilty of the continuing offence. It must be borne in mind, however, that these decisions are directed to the penal provisions only, and do not touch upon the powers of Urban Authorities to pull down buildings erected contrary to their by-laws.

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The East Boston Tunnel.

FROM a recent report it appears that this work, which is to connect Boston (U.S.A.) proper with East Boston, is now progressing at the rate of about 35 ft. per week, each foot run representing some 22 yds. of excavation, and 8 yds. of concreting. At the present time the material penetrated consists of dense blue clay containing very little gas or water, and operations are conducted by the aid of a shield working with compressed air at a pressure of 22 lbs. per square inch. The force required to advance the shield averages twenty-two tons, and it is frequently possible to effect three movements within the period of twenty-four hours. Concrete used for the tunnel is mixed in 16 ft. batches in a Carlin machine worked by an independent engine at the foot of the shaft, and each batch is received in a small car and run immediately to the heading. Concrete for the invert is carried in wooden cars having pivotted sides arranged so as to distribute the material as it is raked out, and material for the arch is taken in smaller steel cars running along an upper platform, one end of each car, instead of the sides, being hinged. Steel anchors are built into the arch concrete as the work proceeds, and the ends of the anchor plates, projecting into the tunnel, will form connexions for the support of the overhead ceiling of the ventilating chamber to be constructed after the tunnel is otherwise completed. Where concrete of spongy nature occurs in the lining, the practice is to fill up voids by the injection of thin grout through pipes inserted in the faulty material, and it is said that this expedient gives more satisfactory results than would be afforded by cutting out the defective parts.

The Turin Exhibition.

THE international exhibition of decorative art at Turin was to be opened to the public on the 10th, but at a visit paid to it last week it looked unlikely that it could be ready by then. Through the courtesy of Mr. Walter Crane, who is arranging the exhibits of the British section, we were allowed to walk round some of the buildings and to see the principal part of the British exhibits. The buildings show a good deal of originality, quite permissible in such temporary structures, and they look from the outside as though they are planned by one mind, while within the decoration is left to the taste of the country occupying the space. If the style without is fantastic, the style within of some sections, notably the Glasgow school and the German, is rich in all that is weird and ugly. Very few of the actual exhibits were to be seen, but we hope that the best work only of each country will be shown, and that the exhibition will be largely visited by artists and craftsmen as well as by the public. In jewellery and in carving England is much behind in the crafts, France and Italy respectively being ahead of us. In schemes for monumental buildings and public improvements we can learn much from our neighbours, but we have always held that decorative art applied to the comfort and beauty of town and country houses has been carried further and more successfully in England than in other countries. At Turin we are admirably represented by a selection of work made by the Arts and Crafts Society, and by a room devoted to the works of Mr. Walter Crane. Several frames of architectural photographs illustrate the progress of English architecture from Pugin to the present day. The younger school of architects and decorators is worthily represented by examples of Professor Beresford Pite's work, a model of a house by Mr. Prior, and photographs of interiors by Mr. Weir Schultz and Mr. Lorimer. One or two excellent pieces of furniture are sent by Mr. Sidney Barnsley and Mr. Gimson. In reliefs Mr. Frampton, Mr. Anning Bell, and Mr. H. Wilson are well represented. The jewellery, as well as many other exhibits, had not then been arranged.

Changes in the Strand (West).

RAPID progress is being made in the demolition of the Lowther Arcade and of the houses that constituted the central feature of the south and principal front of the block which extends from Agar-street to Adelaide-street. The houses we indicate were marked by their advanced fronts with a façade of engaged columns carried up the first and second floors and supporting a cornice and balustrade. The entire block—illustrated in the *Mirror*, of October 22, 1831—forms a portion of the new buildings that were erected for the improvement of that quarter of the Strand in pursuance of the Act 7, George IV., c. 77, Decimus Burton being architect of most of the new buildings (including Charing Cross Hospital), and W. C. Mylne acting as valuer on behalf of the Government. At that time, 1829-31, William, Lord Lowther, was Chief Commissioner of Woods and Forests; the Arcade, named after him, was built in 1830-2 for Jacob Perkins, the engineer, from designs by Witherden Young, who was architect also of the adjoining Adelaide Gallery, latterly absorbed in a well-known restaurant. The Arcade, having originally twenty-five shops, together with six in Adelaide-street and West Strand, covered a total area of about 16,000 ft. superficial, held under one lease from the Crown, of which twenty-seven and a half years are still unexpired, at a ground-rent of 1,270*l.* per annum. The interest in the lease was offered for sale at auction four years ago by the trustees under the will of the late Mr. William Bird, and was withdrawn from the projected sale at 30,000*l.* We gather that the property has recently been acquired by the proprietors of Coutts's Bank. The Arcade, measuring 245 ft., with a passage 20 ft. wide, and being 35 ft. high, was lighted by a row of small domes carried by pendentives, and presenting a very pleasing architectural effect. On the south side of the main street has been begun the pulling down of Beaufort-buildings and of two or three of the houses in the Strand at the two corners of Beaufort-buildings, preparatory to a clearance of the site, and a raising of the level, for an enlargement of the Savoy Hotel and other new works, which we briefly described in our "Note" of February 8 last, p. 128 *ante*, for the widening of the Strand between Terry's Theatre and the Hotel Cecil.

The Guards' Chapel, Wellington Barracks.

IT is stated that a committee of former and present officers of the four regiments of Foot Guards have approved of the general designs prepared by Mr. Clayton—with whom, we understand, Mr. Pearson will act as architect—for a memorial which shall commemorate the 700 guardsmen, including twenty-one officers, who have fallen in action or died of wounds or disease in the course of the present South African war. The committee intend to complete the decoration of the apse of the chapel with mosaic embellishment in front of the mosaic memorial, to the late General Philip Smith, in the half-dome, and to replace the white stone columns of the arch of the apse with columns in alabaster. The apse forms the only sign, as visible from without, of what is practically the beautiful basilica which G. E. Street constructed within the pseudo-Greek shell of the chapel.

The Grafton Gallery.

AT the Grafton Gallery is a double exhibition of two very different classes of portraits; highly finished oil-paintings by one of the most accomplished of French artists, M. Benjamin-Constant, and pencil heads by an English amateur, the Marchioness of Granby. These latter, which are numerous, are very simple and unpretending pencil sketches, on a small scale, mostly of heads only. The portraits of ladies, with some few exceptions, are rather deficient in marked character; it may be said that Lady Granby, unlike most lady artists, succeeds better with the portraits of men than of women. The likenesses of a good many public men—Lord Salisbury, Mr. Balfour, the late Mr. Rhodes, and others, are good and energetic, and show a great facility in catching a likeness. The portraits by M. Benjamin-Constant are twenty-five in number, and include some of his most sumptuous performances: several of them we remember at the Salon from time to time. A collective view of this painter's portraits suggests something wanting in them, in spite of their effectiveness; partly it is, we think, a want of sympathetic feeling in the artist for his sitter; partly a hard and cold manner in flesh painting. Some of the most sumptuous portraits of ladies impress one as if the effect of the costume were the principal object; the countenance is the least important thing in them; and there is a certain hard glitter of effect which arrests the attention, no doubt, but which is not one of the highest qualities in portrait painting. Some of the portraits of men—that of M. Schneider, for instance, are characteristic and energetic enough; and when the artist can lay aside his desire for glitter and concentrate his attention on the countenance we find him at his best, as in the very fine portrait of an old lady, Mme. Laugier, in which the head is painted with the greatest power, and the simple and dark-coloured dress leaves it free to assert itself without the distraction of minor details. This is perhaps the best thing in the gallery.

"Mr. Punch in Bond-street."

THIS is the title given to a most interesting collection, at the Woodbury Gallery in Bond-street, of original drawings by various artists on the staff of *Punch*. Without finding any fault with the manner in which the *Punch* engravings are produced, one cannot but feel that we get a much more just appreciation of the talent and force of many of these drawings from seeing them in their original form and on a larger scale than the engraved illustrations. Among the best in the collection are those of Mr. Bernard

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Partridge, which show also that he can succeed in very different classes of subject. "The Curate," which is one of the few brush drawings in the room, is quite pathetic in feeling, as well as an admirable drawing; equally good is another in the same manner of execution, "A Window in Thrums," the portrait of the old dame who observed her neighbours' doings through that celebrated casement. In contrast to these are such admirable line drawings as the "Frontispiece to the *Punch* Almanack 1902," and "Paws Off," an admirable imitation of the characteristics of Chinese drawing. Besides these, the honours are perhaps divided between Mr. Phil May, who holds the top of the room, Mr. Reed, and Mr. Sambourne; among the drawings of the latter artist may be specially mentioned the "Return of Queen Victoria from Ireland," with the beautiful figure of Hibernia wafting her farewell, and the spirited drawing "History Repeats Itself," where Lord Kitchener is interviewed by the shade of Dryden. Mr. Harrison's archaic study of the scene where the "Roads were always up in Ancient Egypt" is a masterpiece of humour and burlesque antique; Mr. Ralph Cleaver, in the drawing entitled "These Parents," may claim to be the successor of Mr. du Maurier in the neat delineation of the Society young woman; and Mr. Stampa shows charmingly his sympathy with the boy, in "Youthful Gallantry" and "A Lesson in Geography." Mr. Partridge, by the way, contributes what, as far as we noticed, is the one architectural drawing in the room—a sketch of "Les Halles" at Malines.

Pastels by M. Simon Bussy.

AT the Dutch Gallery, 14, Brook-street, is a small collection of pastels, chiefly landscape studies, by M. Simon Bussy, which deserve attention, though we think their claims are somewhat exaggerated in the preface to the catalogue. The artist handles the medium of pastel with a thorough acquaintance with its special character and its limitations; he does not attempt to do too much with it, but uses it mainly for studies of effect. In this respect his study of the lakes of the Engadine in twilight, the Bernese Alps at sunset, and some others of the same class, are fine and effective indications of the spirit of landscape. The bright sketch of Villefranche-sur-Mer is a very successful study of another type of effect. There is not, however, much of daylight or sunshine in the sketches, the general effect of which is rather depressing; but they are at all events not commonplace work.

Abergavenny New Workhouse.

A CORRESPONDENT sends us an advertisement from a local paper, in which the Abergavenny Union request architects to state the terms on which they will furnish plans, specifications, and quantities for a new workhouse, and supervise the building. It is really disgraceful that such an advertisement should be addressed to the architectural profession. Abergavenny is not such a small or out-of-the-way place that the Guardians might not be expected to know the world better than that. If they wanted the services of a solicitor, would they venture to insert an advertisement to the legal profession asking them to state their terms for acting? And if not, why do they insult the architectural profession in this way? They may be certain of one thing—they will not obtain the services of any respectable architect in that manner.

MAGAZINES AND REVIEWS.

THE two first articles in the *Art Journal* both refer to the Wallace collection, the first being on the collection of armour at Hertford House, by Mr. G. F. Laking; the second, No. 5 of Mr. Claude Phillips's articles on the pictures in the Wallace collection. Mr. Phillips is still dealing with the French pictures; those of Marilhat (whom he compares with Decamps), Couture, Horace Vernet, Meissonier, Corot, and Rousseau. Though we quite agree that it is possible to overrate Meissonier—that this is in fact no uncommon error, we think Mr. Phillips is somewhat harsh in his judgment of him. Though it is true that Meissonier had, as far as pictures go, no soul whatever—they are pieces of brilliant execution and nothing more — this execution was so wonderfully fine, and was the product of so much honest and unshrinking application and study, that it merits a rather less grudging acknowledgment than we find here given to it. Occasionally too, Meissonier did rise above mere execution. His small picture of Napoleon on horseback under the title "1813," is really a wonderful summary of the fateful side of Napoleon's career. The article is accompanied by full-plate illustrations of the two grand landscapes by Corot and Rousseau respectively—"Macbeth and the Witches" and "A Glade in the Forest of Fontainebleau," which are among the most precious treasures of the Wallace collection. Mr. Phillips notes the fact that no example of Millet found its way into this collection. One can hardly be surprised at that, however; neither Hertford House nor Bagatelle were quite the atmosphere for a Millet. We read with sympathy an illustrated article on that rarely gifted painter and charming man C. R. Leslie, written jointly by his son and by the secretary of the Royal Academy. Leslie was stronger even in technique than is quite recognised nowadays—witness his "Mother and Child," illustrated here, and seen not long since at one of the Burlington House loan collections; but beyond that he was a painter of the most remarkable and delicate faculty of inventive humour, and in this sense he was, as an illustrator of literature, an artist of quite exceptional insight. His "Katherine and Petruchio" is one of the best Shakespeare illustrations ever made; they are Shakespeare's own people brought to life on canvas.

The *Magazine of Art* is chiefly devoted to the works of various rising artists who have exhibited original talents and evolved a line of art of their own. The most interesting of these to us is Mr. Lynn Jenkins, whose admirable symbolical metal and ivory frieze for the decoration of the hall in Lloyd's Registry buildings we noticed with appreciation when it was in the sculpture-room of the Royal Academy last year. The article is accompanied by an illustration of his very good design for a Victoria Monument for Liverpool; the treatment of the pedestal and its attendant figures is especially praiseworthy. The article is by Mr. Spielmann, the editor. Another illustrates the work of a very clever and original lady artist, Miss Gloag, and another is devoted to the works of the new painter of Dutch life, Mr. Jungmann. Mr. W. Roberts contributes an interesting paper on "Copies" of pictures, one of a series on "Curiosities of Art." We could furnished a story which is not included—that of Muller, the landscape-painter, mistaking for one of his own works a surreptitiously made copy of it. Muller thought he had found his own landscape at a house where he was visiting; but a friend who had been with him when he painted it, said suddenly "Muller, this cannot be *your* picture; do not you remember there was a sketch of a waterfall on the back of it"; a fact which the artist did remember. The canvass before them was clean on the back, and until this discovery, the artist had himself taken the copy for his own work. *Sic vos non vobis, &c.*

The *Architectural Record* (New York) for this quarter has a cover beautified with part of a colonnade shown in silhouette, and a decorative lawn, fence, and landscape beyond. The number is entirely devoted to the illustration of the works of one American architect, Mr. Ernest Flagg; a very successful architect, as we had long been aware, though we did not gather that, in the artistic sense, his works were quite worth a special number of a magazine. Mr. Flagg evidently has an immense practice, and there is a great deal of cleverness in the numerous designs illustrated here, but except in one case we should say that cleverness is more prevalent than refinement of design. The one exception is the façade of the Corcoran Gallery of Art at Washington; a very suitable treatment founded on Greek lines, and well carried out in detail. But we do not think the best of our English architects will have anything to learn from the general illustrations of Mr. Flagg's work, important as it is in a sense.

In the *Berliner Architekturwelt* the competition designs for the Berlin Exhibition continue to find place, and show one or two wild architectural dreams. Herr Hartmann shows a circular domed hall resting on a low order of Doric columns at the base, with a ribbed treatment of the dome and a series of colossal heads above the entablature of the colonnade; but the dome quite crushes the Order. A design, No. 74, without the architect's name, shows a treatment of a circular central hall which is more reasonable in its notions of architectural proportion. A house in the Bellevue-Strasse, by MM. Cremer and Wolfenstein, has an original but too "fidgetty" façade, and an effective hall interior. The designs for Bismarck monuments which continue to appear — there is one this month by Herr Bruno Schmitz — seem inspired by a desire to represent a kind of dream of the world before the Flood, of the kind of monuments men might have designed in the infancy of the human race—cyclopean, unhewn, rock-built rather than sculptured; they remind one of some of Blake's sketches of primeval architectural conceptions in his poems. There is no doubt something grand about this kind of thing, but it strikes one as rather a conscious acting of primeval grandeur, which is only a fashion of mind of the moment, and will pass away again, leaving another generation rather critical on the aspect of these apparently antediluvian monuments. The Ullstein house in the Kochstrasse, by MM. Hart & Lesser, is a sober Classic composition with a certain individuality of treatment; the main block, with a cornice and an order dividing it into four bays, is symmetrical, but the actual division of the block into two occupations is indicated by a more decorative treatment of detail on one half than on the other. The details, of which larger illustrations are given, are however, rather coarse in character, and the small full-length figures in the caps of the pilasters flanking the principal entrance strike one as being completely out of scale with all the rest of the ornament.

The *Architektonische Rundschau* gives the view, plan, and section of the Prince Regent Theatre at Munich, a finely-planned house in which the curve of the auditorium is expressed (as we think it always should be) in the exterior architectural treatment. The plan of the auditorium and of the concentric foyers or corridors spreads outwards like a fan from the stage line. We give a reduction of the plan, from which it will be seen that the approaches, exits, and surroundings are planned with a liberality which we never meet with in an English city. The exterior is in a classic treatment of severe and sufficiently dignified character. MM. Heilmann & Littmann, of Munich, are the architects. There is nothing specially to be remarked in the other illustrations, except that in the interior from a villa in Grunewald the gallery shows a suggestion for a new treatment of a balustrade — ingenious, though perhaps a little too pretentious.

The *Art-Workers' Quarterly* contains much useful practical description of processes in industrial art, and illustrations of various classes of work which are all in a good style. One of the most interesting and useful articles is that on "The Construction of an Iron Gate," by Mr. Harold Smith, with sketches of the attachments of the various parts. Other articles are on "Hand-weaving as a Craft," by Mr. Joseph King, and "Stencilling" by Mr. George R. Rigby. He refers to and explains the *modus operandi* of the Japanese in making their wonderfully elaborate thin paper stencils, and strengthening them where necessary afterwards. Three pages of very fine specimens of Italian lettering of the fifteenth and sixteenth centuries are among the other attractions of an excellent number.

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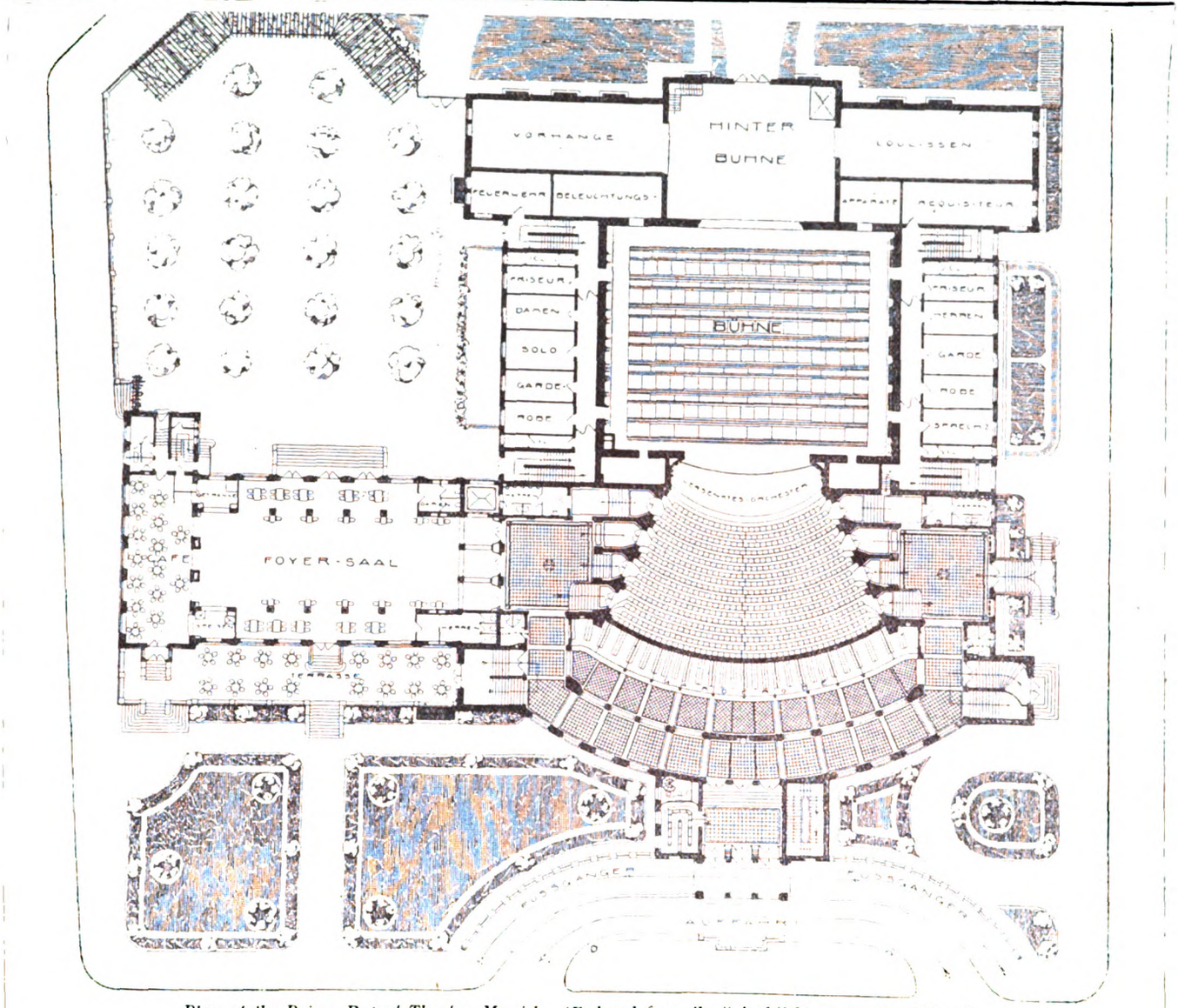

Plan of the Prince Regent Theatre, Munich. (Reduced from the "Architektonische Rundschau."

In *Feilden's Magazine* an article by Mr. Twelvetrees on "The Manufacture of Portland Cement" contains a detailed description of the various processes followed in the production of cement, and the precautions that must be taken to secure uniform results. We quite agree with the statement that calcination to the proper degree is a matter most difficult of control. It is, at the same time, one of the most important to the user, for underburning means weak cement, and overburning means inert material. An account is also given of the tests commonly made in cement works. These are usually confined to the examination of neat cement, a practice which, it is correctly remarked, is not entirely free from objections, especially when tensile tests are concerned. The most interesting part of the article is that descriptive of the new "rotary" plant now in course of erection at the Wickham Works, Rochester. Rotary kilns are in almost universal use in the United States, and although similar plant has previously been adopted in this country, it has not hitherto proved to be an entire success. The improved apparatus described in the present article is said to have been practically tested for a period of two years, and it certainly appears to possess advantages not enjoyed by the ordinary form of rotary plant.

In the *Engineering Magazine* we notice an instructive article on "The False Witness of the Test Bar," by Mr. Robert Buchanan, a foundry manager of considerable experience. The essential questions considered by the author are whether cast-iron test bars give a true indication of the quality of the castings they represent; and if not, to what extent do they mislead. Two most important factors influencing the character of iron are the casting temperature and the rate of cooling. Some remarkable examples are given of the differences in strength and chemical constitution obtained by casting bars separately, and by running them from the casting itself. In one case the bars are cast "hot" and cool quickly, and in the other they are cast "dull" and cool at a slower rate along with the casting. The result, as the author points out, is that bars cast separately are stronger than those cast on, and that the nearer the test bar is to the main casting, the weaker it must be. The writer fears that the ambition of founders in the past has been less the making of strong castings than the production of satisfactory test bars, and he suggests that test bars should invariably be run from the casting so that a truer indication of quality may be obtained. This is very candid advice, and its universal adoption is certainly to be desired. The article on "The Factory Office" is a very practical one, suggesting the best methods of administering the work of a factory.

In the *Nineteenth Century* Mr. A. Higgins writes a thoughtful article on "Dante and the Fine Arts," which will be interesting to students of the "Divina Commedia." The special object of the article is to rebut a theory of Mr. Berenson that we should find in the illuminators and painters of the fourteenth century the key to much of Dante's imagery; that he wrote from the suggestions and conceptions of contemporary art. This seems, even at first thought, a most unlikely origin for conceptions so entirely transcending the range and powers of painting of that period, and Mr. Higgins, in pursuing the subject in detail, shows we think conclusively that there are conceptions in Dante for which no parallel whatever is to be found in early Italian art.

In the *Monthly Review* Mr. Cook's phantasy, as we should call it, in regard to the staircase at Blois having been built by Leonardo as a suggestion from the spiral of a shell is concluded, and may seem all very interesting and subtle to the general reader, but is no more conclusive than the reasoning of the people who used to think that the Gothic vault arose from the imitation of the boughs of trees. Architectural problems of this kind *solvuntur ambulando*; once make use of a spiral staircase (no very recondite idea in itself), and the further development of its architectural structure and decorative treatment is only, like the mediæval vault, a series of steps in practical experiment in construction and design, to which Nature in reality offers no analogy; nor do the author's specimens of shells afford any hint for the detail of the Blois staircase, though he labours hard to make the reader think so. Articles of this kind do nothing to advance the public comprehension of architectural design. Mr. Roger E. Fry's article on "Art and Religion" contains a high enthusiasm and some fine thoughts. His special point is the radical difference between painting for the church, as artists did in bygone days, and painting for exhibitions, as they do now. There is a great gulf, certainly, between the two, as modern painting is generally practised, but after all what is wanted is not so much the Church as a high and spiritual aim in art, which may exist quite apart from the Church, as Mr. Watts's pictures, among others, do testify. Nor can we quite admit Mr. Fry's argument that the treatment of only a few well-known and popularised subjects, such as the Church legends, led to people thinking more of the art and less of the subject; probably the general crowd who saw religious paintings in the good old days thought of them simply as telling a story, just as the general crowd of Academy visitors do now. And if they had thought more of the art and less of the subject, that was exactly what the Church did not want! Browning's "Filippo Lippo" is the best comment on that argument.

In the *Century* Mr. W. H. Pickering treats the question which Mr. Maunder recently treated in the *Pall Mall Magazine*—"Is the

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Moon a Dead Planet?" His conclusions are rather different from Mr. Maunder's. The drawings of certain craters as seen at various times are very interesting, and seem to support the writer's view that there are actual changes going on upon the moon's surface, appearances which are not the result of mere changes of lighting. He even shows reason to think that the effect of sunrise on the moon's surface (her day being of course a month long) produces changes which can be observed and recorded. In the same number Mr. Sylvester Baxter writes an article "For Civic Improvement: what to do and how to do it," a subject which seems to be gaining increased attention in the United States. This article deals with the subject in a large spirit, suggesting the consideration of the whole landscape around a town. In some cases the recommendations seem rather to verge upon the dangerous art (so-called) of artificial landscape-making; but the view of a promontory from which all the trees had been gradually removed, contrasted with the possible appearance of the same site when the trees were there, is a pointed argument in favour of the preservation of trees. Some of the illustrations fail of their point because, while we are shown, for instance, what is said to be "An Improved Lakeside," we have no illustration of it before it was "improved," and therefore can hardly judge of the beneficial effect of the operation. The following is worth quoting as a practical argument in favour of the commercial value (even) of city improvements:—

"The great value of a recreatively developed water-front to a city is illustrated by the work undertaken by Cambridge, which, in its scheme of park improvement, has devoted its chief attention to reclaiming and beautifying the banks of the Charles River throughout almost its entire course along the borders of the city. The community thus gains, at the cost of the work upon a comparatively narrow strip of land, the benefit of many hundreds of acres of free water-space for public enjoyment. This river bank, under public ownership, takes the shape of a magnificent esplanade, a riverside drive and promenade, and two waterside playgrounds with bathing beaches. The profitable character of such an investment for a municipality is shown in the fact that the increased taxes upon merely the first piece of improved property abutting upon the esplanade were more than enough to pay the whole interest and sinking fund charges for the entire park work on the river front."

In *Scribner*, under "The Field of Art," Mr. W. H. Low contributes an interesting article on the decorative painting of Galland, Baudry, and Puvis de Chavannes. While recognising the latter as the greatest decorative painter of his time, he does justice to Baudry's paintings at the Opera House, which have been rather unduly depreciated in recent days. Galland was a lesser painter but with an admirable decorative sense, and it was he who was called upon to design the border which was to separate and (if possible) harmonise the works of the different artists employed at the Panthéon, a task in which Puvis de Chavannes had failed.

Harper contains an article on "Amateur Art in Early New England," by Miss (or Mrs) Grace Brownell Peck, which gives us a glimpse into a curious and little-known chapter in artistic history. The *Mayflower* brought over the goods and chattels of about one hundred English settlers, but nowhere is there any mention of pictures. "This omission from her cargo was due . . . . largely no doubt, to the disapproval with which our pious forefathers viewed all works of art, especially those religious masterpieces in which the great artists of the old world had excelled." But when life in the new world had a little developed, and Boston had become a thriving little city, the innate desire for pictorial representation began to show itself in the humble beginnings of a home-made art. Very curious, almost pathetic in a sense, are the *naive* efforts, of which some illustrations are given here; pictorial paper-cutting ("papyrotamia"), painted engravings, clock-case decorations, &c. The account of them is written in a pleasant vein, half of sympathy, half of good-natured satire. Mr. Abbey's illustrations to the "Deserted Village" are continued, but we cannot say we get to like them any better as they go on.

To the *Gentleman's Magazine* Mr. W. Bradbrook contributes a historical and topographical article on "Watling Street in Bucks."

The *Pall Mall Magazine* has been fortunate enough to obtain reproductions of the figure studies for Sir E. Poynter's fine little picture in the Academy, "Storm-Nymphs," and Mr. G. A. Story contributes a vivacious article on "Recollections of the Royal Academy" as regarded from the artist's point of view. The following is characteristic, and what artists and designers of all classes will understand:—

"The first feeling on entering the galleries on the varnishing days is one of humility. A furtive and rapid glance round the rooms too often results in a kind of shock when you come upon your own performances. I remember one veteran member, seeing me looking at my work with gloomy aspect, told me not to be downhearted about it. 'We all feel like that,' he said, 'and if it is any consolation to you I may tell you that I think my own pictures look beastly.'"

It is pleasant to find an old Academician speaking with love and enthusiasm of the works of some artists whom it is now the fashion to regard with indifference or contempt; on the other hand, one is struck by the rather cold terms in which he refers to the most beautiful of all Millais' pictures, which he calls "Nuns digging a grave," depriving it of the poetry of its accepted title, "The Vale of Rest." It is interesting to read of the elder Leslie being offered 1,000*l.* by Lord Egremont to paint a picture of Sancho and the Duchess, and agreeing to paint the picture (perhaps his best work), but declining to accept more than 500*l.* for it, as he "did not feel justified in taking so large a sum as 1,000*l.* for the work in question." Successful painters are hardly so shy about money in these days. Mr. Philpott contributes a short article on the alterations in Piccadilly—one of a series on the rebuilding of London; an article of a popular, not of an architectural character; and Mr. H. W. Brewer contributes historical notes on the Tower, illustrated by his own admirable and suggestive sketches.

The *Revue Générale* includes an article on "Le Projet de Loi Scolaire Anglais;" those interested in the subject of education may like to see how this new attempt at settling our educational system is regarded by a foreign critic. The author, M. Alfred Nerincx, seems to be of opinion that the County Councils ought, by law, to replace the School Boards and take up their work; and that the omission to make this compulsory will destroy all the good that might otherwise be expected from the proposed reform.

The quarterly issue of the *Church Builder* contains an account of the interesting church of Ashton, Devonshire, and of the repairs which have been carried out under the safe direction of Mr. Ponting. "So little has been done in the way of restoration," we are told, that "passing into the church is like passing into the fourteenth century"; an unfortunately rare experience in these days. Mr. J. T. Micklethwaite, in his tenth article on "Church Furniture," writes some remarks on stained glass which represent both artistic feeling and sound common-sense.

In the *Antiquary* Mr. Evelyn White contributes some supplementary notes on the interesting subject of Thatched Churches. Among the curious facts mentioned is the imposition, in more than one instance, of a fine of so many *tiles* (2,100 in one case) for laxity in the observance of the Sabbath, the nature of the fine being obviously an indirect attempt to promote the manufacture and use of tiles as against what was considered the dangerous employment of thatch for roofs. An article and illustration are devoted to an unpublished MS. map of the river Hull, recently added to the collection of the Hull Municipal Museum. It is dated 1668. Canon Raven contributes an article which aims at a new identification of the principal sites or towns in the British Section of Antonine's Itinerary.

The most important paper in *Knowledge* is one on "Clouds," by Commander Wilson Barker, with numerous illustrations from photographs of different types of cloud. The paper is written rather with a scientific than an artistic object, more especially with the view of forecasting the weather from the appearance and form of clouds.

BOULOGNE CEMENT.—Mr. Vice-Consul Farmer reporting on the trade of Boulogne-sur-Mer, records that the exportations of cement from that port in 1901 amounted to 23,047 tons, as compared with 15,204 tons in 1900, and he remarks that "the increased export of cement, of local manufacture, is due to the greater quantity taken by the United Kingdom—9,048 tons in 1901, against 743 tons in 1900."

ANTIQUARIAN DISCOVERIES IN SOUTHWARK.

IT is conjectured that the fragments of ornamental terra-cotta work recently dug up in the graveyard of St. George's Church, Southwark, are relics of the fabric of Suffolk House. Similar fragments of elaborately moulded terra-cotta, together with several crucibles, apparently for use in coining money, and what were believed to be portions of the foundations of that mansion, were discovered *in situ* ten years ago; those remains were described in a paper read by Mr. Earle Way at a meeting of the British Archæological Association, and briefly noticed in our columns of March 12, 1892. We may here state that Suffolk House stood on the west side of the main road, on the site latterly occupied by Pidgeons' distillery, near where is now Great Suffolk-street, at a short distance south from St. George's Church. It is delineated in the foreground of Wyngaerde's view of London and Greenwich, drawn in or about 1550, as an imposing structure with five or six octagonal turrets capped with ogee-shaped cupolas. The house, also known as Suffolk Place, was built by Charles Brandon, Duke of Suffolk, for his wife Mary, widow of Louis XII., and sister of Henry VIII. King Henry exchanged the house with Brandon for the Bishop of Norwich's "inn" near Charing Cross, and established a Mint there, in the re-named Southwark, or Duke's, Place. Queen Mary bestowed the Mint property in the King's Manor upon Nicholas Heath, Archbishop of York, in recompense for York Place, Whitehall, which Wolsey had yielded to her father. In 1557 Heath sold the property. The purchasers disposed of much of the materials of the house, and built many mean tenements on the estate (about 18 acres), but they left enough of the original house to serve as a residence for Sir Edward Bromefield, elected Lord Mayor in 1637, who lived there until 1650. His son John, created a baronet on March 20, 1661, settled "Suffolk, otherwise Southwark, Place" upon his daughter Joyce on her marriage with Thomas, son and heir of William Lant, of London, merchant—whence the neighbouring Lant-street. In 7th Anne an Act was passed for making improvements on the estate, which included Duke and Suffolk-streets, and comprised 600 dwelling houses sold at auction in 1811, after the death of Mr. J. Bullock, of Faulkborne Hall, Essex, M.P. for the shire, whose father had married Elizabeth Lant in 1772. Until our own day the Mint formed one of the most notorious quarters of the town; it ranks as one of the sanctuaries scheduled in the Act of 8 and 9 William III., for the relief of creditors; the debtors' privileges were declared to be abolished by the Act of 9 George I., c. 29 (1723), for the more effectual execution of justice in "Suffolk Place or the Mint." Some silver coins issued in 1551, from Henry VIII.'s Southwark Mint bear a mint-mark "Y" for John Yorke, under treasurer, whom in 1540—being then Sheriff of London—Edward VI. knighted at Suffolk Place. In 1743, Robert Lant, of Putney, leased to the vestry a piece of ground known as Hangman's Acre, which afterwards became the site of the Bridewell, in Great Suffolk-street, built from the designs of George Gwilt the elder.

A LONDON THEATRE *TEMP.* QUEEN ELIZABETH.

AN interesting collection of maps and views of London in the sixteenth and seventeenth centuries, and models of playhouses as in Shakespeare's time, were exhibited recently at the Hall of Clifford's Inn. The maps and drawings were lent by the Topographical Society of London for purposes of what was in effect the inaugural meeting of the Shakespeare Commemoration League. Of the models one is a half-section of the Fortune Theatre in Golden-lane; another model, lent by Mrs. Mond, is a valuable piece of work, representing the first Globe Theatre, which stood in the Liberty of the Clink on Bankside, Southwark. The model was executed, to a large scale, and in accordance with authentical *data*, under the superintendence of Mr. Poel, a leading member of the Elizabethan Stage Society, and is sufficiently big to contain a number of dolls, about 3 in. high, which represent the players and their audience.

The Globe was originally built in the winter

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of 1598-9 by Peter Street, carpenter, and his twelve men, who removed to Bankside the materials of The Theatre which, being the first after its kind, had been built of wood, in 1576, for James Burbage over a portion of the site of Holywell Priory, in Shoreditch. Of the Globe the only extant drawing is that by Hondius, made in 1610, three years before its destruction by fire. Polygonal on plan, it consisted of a wooden "frame" raised upon a substructure of brick and roofed with thatch, which contained three galleries—the ground or "yard" being open to the sky. The part of the frame opposite the main entrance was carried up higher; it had a thatched gable carrying the flagstaff, and contained the actors' "tiring-house," a curtained recess in which were two doors for the actors' entrance on to the stage, a staircase, and a gallery or balcony for scenic uses. The stage, extending into the open area, had a roof, known as the "heaven" or "shadow," carried upon two columns. A portion of each of the upper two galleries was subdivided into private "rooms" or boxes; the players provided stools at a charge of 6d. each for their friends upon the stage; the "groundlings" paid 1d. for standing-room in the pit; the "rooms" cost 1s. apiece; and a charge of 2d. was made for "quiet standing" below the first gallery and for seats in the galleries above. The performances began at three o'clock in the afternoon and lasted about two hours. The new Globe as rebuilt in 1613-4, and the Bear Garden or Hope, both being octagonal on plan, together with the Swan, polygonal on plan, are delineated in the foreground of Visscher's large bird's-eye view of London, published in 1616. The Globe, finally demolished in 1644, stood, it seems, within what is now the north-western angle of the Anchor Brewery (covering the site of Thrale's business residence), that is, south of the new Park-street and east of Southwark Bridge-road. At that spot stood as late as 1799—see Horwood's survey—a Globe-court and a Globe-walk; a Globe-alley there is plotted in Wallis's map of 1808. Francis Langley, draper and aulnager, built the Swan, near Paris Gardens-stairs, in or about the year 1596.

We can gather a general idea of the structural features of the Globe from the numerous references thereto contained in a document preserved amongst the Alleyn muniments at Dulwich College. It is the contractor's portion of an indenture executed between Philip Henslowe and Edward Alleyn, of St. Saviour's parish, and Peter Street, citizen and carpenter, on January 8, 1599-1600, for erecting a new house and stage [the Fortune, already cited] upon "a plot near Goldinge-lane" for the sum of 440*l*. An extract from the indenture may be of inetrest to our readers—we modernise the spelling, a few words excepted:—

"The frame of the said house to be set square and to contain fourscore foot of lawful assize every way square without and fifty-five foot of like assize square every way within, with a good sure and strong foundation of piles, brick, lime and sand both without and within to be wrought one foot of assize at the least above the ground; and the said frame to contain three stories in height, the first or lower story to contain twelve foot of lawful assize in height, the second story eleven foot of lawful assize in height, and the third or upper story to contain nine foot of lawful assize in height, all which stories shall contain twelve foot and a half of lawful assize in breadth throughout, besides a jutty forwards in either of the said two upper stories of ten inches of lawful assize; with four convenient divisions for gentlemens rooms and other sufficient convenient divisions for two-penny rooms, ... and with such like stairs, conveyance, and divisions, without and within, as are made and contrived in and to the late erected playhouse on the Bank in the said parish of St. Saviours, called the Globe; with a stage and tiring house . . . . within the said frame; with a shadow or cover over the said stage; . . . . and which stage shall contain in length forty and three foot of lawful assize and in breadth to extend to the middle of the yard of the said house; . . . . and the said stage to be in all other proportions contrived and fashioned like unto the stage of the said playhouse called the Globe; with convenient windows and lights glazed to the said tiring house . . . . [further references to the Globe] . . . . savi g only that all the principal and main posts of the said frame, and stage forward, shall be square and wrought palaster-wise with carved proporcions called satiers to be placed and set on the top of every of the same posts."

The indenture is executed by Street in a monogram of his initials and is endorsed "Peater Streat for the building of the Fortune." With it may be compared the contract by Gilbert Katherens, and John Browne, of St. Saviour's, bricklayer, 1613, to build the Hope for Henslowe, master of the bears, and Meade, a "sculler" or waterman, which twice stipulates that the Hope shall be made in all things and in such form and fashion as the Swan [in Paris Garden]. The contract is given in full by Malone; we extract the following particulars of it from Mr. T. Fairman Ordish's book, "Early London Theatres (in the Fields)":—

"Katherens covenants to replace the Bear Garden with a gamehouse for bull and bear baiting, and also available as a playhouse with a tire-house and a removable stage to stand upon trestles. Two staircases without and adjoining the playhouse. Heavens (our modern 'flies') to have no supports on the stage; leaden gutters for the same. Two boxes in the lowermost story; partitions between the 'rooms.' Principals and fore-front of oak; all binding-joists to be of oak. Inner principal posts of first story 12 ft. high, 10 in. square, of middle story 8 in. square, of upper story 7 in. square; other posts 8 in., 7 in., and 6 in. square, according to story. Bressumers in lowermost story 9 in. by 7 in., in middle story 8 in. by 6 in. Brick foundations to be at least 12 in. above ground. 'A louvre or storie over the said house.' Browne to lay brickwork for 80*l*.; Katherens to supply all the materials. A bull-house for six bulls and three horses."

In 1606 Peter Street had agreed with Henslowe and Alleyn, masters of the King's game of bears, bulls, and dogs, to reconstruct, for 65*l*., a part of the foreside of the Bear Garden, using good sound timber of oak.

The collection we describe comprised also an enlarged copy of the drawing of the interior of the Swan which Dr. Karl Gädertz discovered fourteen years ago at the Utrecht University Library in a Latin MS. album or "stammbuch" of Arend van Buchell. The drawing is lettered "Ex observationibus Londinensibus Johannis de Witt," and the album contains a brief account of the Rose, the Swan, two other theatres, and a bear-garden. It is supposed that De Witt visited London in 1596, and that the notes by Van Buchell are derived from a now lost MS. of his friend De Witt. The drawing delineates the interior of a circular playhouse with an attic story rising above the "tectum," the "porticus" (second floor), "sedilia" (first floor), and "orchestra" with "ingressus" (ground floor). Into the "planities sive arena" projects the "proscœnium," resting upon large blocks so that it could be removed to leave the amphitheatre free for bull and bear baiting. The inner half of the "proscœnium" is covered with a lean-to and apparently tiled roof extending from the base of the attic and supported by two massive columns rising from the stage. The lean-to roof shelters a raised gallery, "mimorum ædes," divided into partitions in which some of the actors and people of quality are seated to view a performance in which three players are engaged; in the lower part of the "ædes" are two doors which open on to the "proscœnium" or stage. At an opened door of the attic stands a trumpeter calling the audience. The flag on the gable bears the device of a swan. The account says the house was built of flint stone ("constructum ex coacervato lapide pyrritide"), with wooden piers coloured in imitation of marble. De Witt manifestly over-estimates its capacity in writing "quippe quod tres mille homines in sedilibus admittat." Nevertheless we have in that faded pen-and-ink drawing a fairly trustworthy picture of a London playhouse as it appeared at or just about the time that Shakespeare was living, *teste* Malone, as actor and playwright near the Bear Garden in Southwark.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

ANNUAL GENERAL MEETING.

A SPECIAL general meeting of the Royal Institute of British Architects was held on Monday evening, Mr. John Slater, Vice-President, occupying the chair.

The Chairman moved: "That, subject to his Majesty's gracious sanction, the Royal Gold Medal for the promotion of architecture be presented this year to Mr. Thomas Edward Collcutt, for his work as an architect."

The motion was carried by acclamation, and the special meeting terminated.

The annual general meeting was then held, and the report of the Council for the official year 1901-1902 was agreed to. The Report stated that:—"Since the publication of the last annual report the Council have held nineteen meetings, of which the Council elected in June last have held fifteen. The losses by death have been as follows:—Fellows: E. W. Barnes, R. Isaac Bennett, James Brooks, J. McKean Brydon, Arthur Cates, W. G. Doolin, E. Gregg, W. J. Hopkins, C. J. Innocent, G. Judge, J. Littlewood, J. Mackland, E. H. Martineau, W. G. Penty, F. W. Porter, J. Stevens, W. Larner Sugden, H. R. Yeoville Thomason; Associates: W. Bassett-Smith, W. Chastel de Boinville, Goymour Cuthbert, T. Gordon, J. L. Hodgson, J. A. Russel Inglis, H. R. Lloyd, H. T. Porter; Hon. Fellows: The Marquis of Dufferin, Sir Richard Temple; Hon. Associates: Hugh Leonard, A. T. Osmond, E. W. Smith; Hon. Corr. Member: Victor Schroeter. While recording the above, the Council again express their deep regret at the loss of their old and valued colleagues, James Brooks, Arthur Cates, and J. M. Brydon. To Arthur Cates the Institute owes the present development of the Examination scheme. James Brooks was always a wise counsellor and loyal friend. J. M. Brydon, taken away in the midst of his work for the Institute as Vice-President, and in the early tide of his fame as an architect, before he could see one stone of his life's principal work placed upon another, will always be a memorable and pathetic figure. . .

The following tabular statement shows the present subscribing membership of the Institute, compared with that at the corresponding period last year:—

Year.	Fellows.	Associates.	Hon. Associates.	Total.
1901	621	1,028	46	1,695
1902	617	1,071	44	1,732

During the official year, since the last annual general meeting, twenty-five Fellows have been elected, and seventy Associates. Three Hon. Corr. Members have been elected: Sainte-Marie Perrin (Lyons), Enrique Mariá Repulles y Vargas (Madrid), M. Alberto de Palacio (Madrid).

The usual Progressive Examinations were held in June and November, 1901, and, as last year, the Council have to report a steady increase in the number of candidates for each of the examinations. The Preliminary was held in London, Birmingham, Bristol, Cardiff, Dublin, Exeter, Leeds, Manchester, Newcastle, York; the Intermediate in London, Bristol, Leeds, Manchester, Newcastle, York; and the Special examination for colonial candidates was held in Montreal. The very cordial thanks of the Council are due to the hon. secretaries and examination committees of the various Allied Societies and of the Institutes of Quebec and Ontario for their ready and valuable assistance. The Final and Special examinations were held in London. . . . The total number of candidates examined during the year was 674, as against 603 in 1900. The number of Probationers of the Institute now stands at 1,699, and of Students at 402.

Owing to the death of the donor, there were no Arthur Cates prizes available for award as a result of the examinations last year. But now the Council, having invested the sum of 1,500*l*. bequeathed by Mr. Cates to the Institute for the purpose of endowing a prize to bear his name, have instituted such a prize under the general conditions regulating the prizes and studentships, and have thought they were best carrying out Mr. Cates's wishes by drawing up the conditions as nearly as possible on the lines of those laid down by Mr. Cates for the prizes he awarded during his lifetime. The Ashpitel Prize was awarded to Mr. Charles Thomas Adshead, who passed the Final examination in November. A special prize of books to the value of ten guineas was awarded to Mr. F. Dare Clapham, a special candidate at the June examination, who made the highest number of marks recorded in the Final examinations. The "special" examination will be held this year in Montreal and Melbourne. . . .

One of the most interesting events of the year was the Institute visit to Glasgow in October. According to recent custom the annual dinner of the Institute is held at a non-metropolitan centre every third year; it was held in 1895 in Manchester, in 1898 in Birmingham, so that in 1901 came the turn of a non-metropolitan gathering. The Glasgow Institute, taking advantage of the fact that the International Exhibition would be a great attraction to their city, invited the Council to hold the annual dinner in Glasgow last year. The dinner took place at the Windsor Hotel, on Thursday, October 4, the attendance being larger than at any previous Institute dinner, with the exception of that held in 1900 in

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London, when H.R.H. the Duke of Cambridge was present. On Friday, the 5th, the Institute was publicly entertained by the Glasgow Institute at lunch, the Glasgow University at tea, and the Corporation of Glasgow at a large evening reception. The hospitality shown to the Institute as a body and to members individually gave a social charm to a most interesting visit. The annual dinner will take place this year at the Hôtel Métropole, on Thursday, June 19.

Messrs. W. M. Fawcett and W. H. Seth-Smith have been elected as representatives of the Council on the Council of the Architectural Museum. The vacancy on the Board of Directors of the Architectural Union Company caused by the death of Mr. Arthur Cates, has been filled by Mr. P. Gordon Smith. The vacancy on the Tribunal of Appeal (London Building Act 1894), caused by the death of Mr. Cates, has been filled by Mr. E. A. Gruning. The President attended, as the delegate of the Institute, the Jubilee of Owen's College, Manchester, celebrated on March 12 and 13. Messrs. Thos. Blashill and John Slater have been appointed to represent the Institute at the annual Congress of the Sanitary Institute to be held at Manchester in September.

The Council regret to say that the action they have taken with regard to the execution of Mr. J. M. Brydon's design for the new Government buildings in Parliament-street, and the amended conditions for the Liverpool Cathedral Competition, has been fruitless of result. In June last, on the recommendation of the Art Committee, a letter was written to the Dean of St. Paul's urging the public exhibition of the designs for the decoration of the drum of the dome. An acknowledgment of receipt of the letter was received from the Dean. . . .

At the request of the Master of Magdalene College, Cambridge, and with the permission of Mr. Sargent, R.A., the portrait of Mr. Penrose has been copied for Magdalene College by Mr. C. N. Newton. The portrait of Professor Aitchison by Sir L. Alma-Tadema, R.A., was lent by the Council to the Royal Birmingham Society of Artists for their annual autumn exhibition.

The Council have been in correspondence with the Ulster Society of Architects, a new Society admitted into constitutional alliance with the Royal Institute of Architects of Ireland, with regard to the Belfast Corporation Bill now before Parliament. Certain clauses giving the control over the design, elevation, and height of buildings in Belfast were strongly opposed by the Ulster Society. The Council gave the Society their unconditional approval and promise of active support if needed. The objectionable clauses have been dropped in Committee of the Lords, and the Society, being successful, have withdrawn their opposition.

The resolutions passed at the general meeting on December 2, 1901, with reference to Rural District By-laws, to the effect that provisions in a model set should be made to enable Rural District Councils to regulate party walls as distinct from external walls, and also with reference to extending the regulations as to party walls laid down in the London Building Act to the whole of the United Kingdom, have been forwarded to the Local Government Board. The Board has not yet communicated its decision on these matters to the Council.

The Council, hearing of the proposed colossal building to be erected by an American syndicate on the "island site" of the Holborn to Strand improvement scheme, and seeing an illustration of the design published in a periodical, sent a protest on the subject to the London County Council, from whom they received a sympathetic and satisfactory reply.

The Joint Committee of the Royal Institute and the Surveyors' Institution have drafted a "Bill to amend the Law relating to Easements of Light," which has received the approval of the Councils of the two bodies. It has now been referred back to the Joint Committee with powers to take steps to have it brought before Parliament as soon as possible.

As the necessity of obtaining new premises is year by year growing more pressing, owing to the gradual expansion of the various interests with which the Institute is occupied, the Council have turned their serious attention to the matter. The sum of 1,000*l.* has been invested in Indian Government stock and appears on the balance-sheet appended to the Report as the nucleus of a building fund, which will be allowed to accumulate practically at compound interest. Without wishing at the present moment, when no specific building scheme is before them, to open a formal subscription-list, the Council beg leave to draw the attention of members to this fund, to the increase of which they would be very glad to receive any donations. The movement towards obtaining new premises has, however, gone so far as this :—A Joint Committee of the Council of the Institute and the General Committee of the Architectural Association have met and have reported that it is desirable for the two organisations to combine in one building scheme. The Council have approved this report, and have agreed with the General Committee of the Architectural Association that while it was desirable that they should occupy one site and have some of the accommodation in common, yet the respective premises should be to all intents and purposes separate buildings. The Joint Committee having thus reported on the desirability, are now considering the other point of their reference, *i.e.*, the possibility of the two bodies uniting in such a scheme. This can only be decided when definite sites have come under discussion. Two members of the Joint Committee have been commissioned to take steps to find a suitable site. A rough estimate has shown that the requirements of the Institute will need some 10,000 ft. super., and those of the Architectural Association 5,000 ft. super. The Council will gladly receive information as to available sites from members. The present premises are leased to the Institute until March 24, 1920, but the lease can be determined at Midsummer, 1904, by giving six calendar months' notice. Owing to the need of more accommodation the Council have had the basement-room of the Institute premises converted into an office for the assistant secretary. They have also arranged for bookcases for octavo books to be fitted along the wall of the Meeting-room, and are considering a scheme for the treatment of the wall behind the President's chair so as to allow for more picture space. In accordance with a suggestion made at the last annual general meeting, the Council have taken measures to secure more comfort and better lighting in the Meeting-room.

In order that the Institute should to some extent co-operate in their useful work with the Coal Smoke Abatement Society, the Council have arranged for one of their number to have a seat on the Committee of the Society, and Mr. W. D. Caröe has consented to serve as the Council's representative. The Council have contributed a donation of five guineas to the funds of the Society. The Council have granted a donation of fifty guineas to the Cretan Exploration Fund (Knossos Excavations). The Council have also voted a grant of twenty guineas per annum for five years to the British School at Rome.

The question of the appointment of assessors has been brought to the notice of the Council, first through the discussion at the business meeting on December 2, and again by a set of resolutions passed at an informal meeting of London architects interested in competitions. These resolutions are of a far-reaching character and demand serious consideration from the Council, who have referred the matter for report to a Select Committee of their number. . . .

The Council have great pleasure in drawing attention to the prosperous financial condition of the Institute, as shown by the facts that the balance of income over expenditure for the year is 1,300*l.*, and that during the current year 1,000*l.* has been invested in Indian Government stock and 500*l.* in Queensland Government stock, thus bringing the total amount of the invested capital of the Institute up to 11,500*l.* A statement of income and expenditure and balance-sheet for the year ending December 31, 1901, and an estimate of the income and expenditure of the present year are appended."

Reports of the various committees were also submitted. The report of the Science Standing Committee stated that the supporting power of rocks and soils is still under inquiry. The Committee are collecting particulars from various sources. The Committee have had under consideration the proposed standard sizes of steel sections. The Committee's suggestions have been forwarded to the Standard Committee of the Institution of Civil Engineers. The Committee have under consideration the subject of cement concrete in flats and floors, and are waiting the result of some further experiments to make a report on the behaviour of concrete.

The report of the Practice Standing Committee stated that: "As anticipated in our last report, the new book on 'Dilapidations' to be issued by the Institute was completed in proof at the close of last session. Copies were sent to the Council with a request that one should be sent to the Surveyors' Institution and another to the Institute solicitors asking their kind perusal and suggestions for improvement. Valuable suggestions were received from each, and these are now receiving the careful attention of the committee, who hope to complete the book by the end of this session. It is proposed to send a copy through our solicitors to the Incorporated Law Society, asking for any suggestions they may wish to make as to the purely legal parts of it. On the suggestion of the Council the committee have proposed alterations in the Institute form of contract and conditions to fit them for use when quantities are to form a part of the contract. A letter from the Bristol Society of Architects suggesting a new clause in contracts having reference to prime costs and discounts was referred to the Committee by the Council. The Committee reported that the proposed clause was not satisfactory and would introduce many difficulties, and that Clauses 27 and 28 of the Institute conditions should be generally accepted. . . . The special attention of the Council has been called to the case of 'Hobbs *v.* Turner,' tried in the Court of Appeal in January last. In giving judgment the Master of the Rolls said that in the absence of a special contract between the general contractor and sub-contractors the building owner, and not the general contractor, is responsible to the sub-contractors for payment, as under the general scope of a contract 'privity of contract' exists between the building owner and all sub-contractors. The Committee have requested the Council to ascertain whether this decision will interfere with the conditions of contract as now published."

Scrutineers for the annual election of the Council and Standing Committees having been elected, Messrs. Louis Ambler and H. S. East were nominated as auditors.

The following gentlemen were then appointed to form the Statutory Board of Examiners under the London Building Act, 1894, and other Acts of Parliament: Messrs. Lacy W. Ridge, J. Douglass Mathews, Arthur Ashbridge, Thomas Blashill, Arthur Crow, F. W. H. Hunt, R. P. Notley, Professor Roger Smith, H. D. Searles-Wood, B. Tabberer, T. H. Watson, W. Grellier, W. E. Clifton, F. E. Eales, and F. Hammond.

The following candidates for membership were then elected: as Fellows: Mr. J. G. Sivewright Gibson, London; and Mr. H. W. Chatters, Cheltenham. As hon. Associate, Mr. A. A. Hudson, Wendover.

New Form of Building Contract.

At the same meeting the Institute was asked to sanction the issue of a form of agreement and schedule of conditions for building contracts for use where quantities form part of the contract, the document being based on the form now in use with such variations as are necessary to meet the requirements of the proposed new form. The following are the clauses of the existing form which have been modified by the Practice Standing Committee to adapt them to the new purpose, the alterations and additions being printed in italics :—

1. The works shall be carried out in accordance with the directions and to the reasonable satisfaction of the architect, in accordance with the said drawings and specification *and bills of quantities*, and in accordance with such further drawings, details, and instructions in explanation of the same as may from time to time be given by the architect. . . . The contract drawings and specification *and the priced Bills of Quantities* shall remain in the custody of the architect, and shall be produced by him at his office as and when required by the employer or by the contractor.

3. The contractor shall on the signing hereof furnish the architect with *the fully-priced bills of quantities* for his use or that of the Surveyor appointed as in Clause 13 hereof, and for the purposes only of this *contract*.

Clause 13.—The penultimate sentence to read :—

The variations shall be valued at the rates contained in the *priced bills of quantities*, or, where the same may not apply, at rates proportionate to the prices therein contained.

27. The words "prime cost" or the initials .C. applied in the specification *and bills of*

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quantities to goods to be obtained and fixed by the contractor, shall mean, unless otherwise stated in the specification *or bills of quantities*, the sum paid to the merchant after deducting all trade discount for such goods in the ordinary course of delivery, but not deducting discount for cash, and such sum shall be exclusive of special carriage, the cost of fixing, and contractor's profit.

28. The commencement of the clause to read :—

The provisional sums mentioned in the specification *and bills of quantities* for materials to be supplied or for work to be performed by special artists or tradesmen, &c., &c.

The proposals were agreed to, two members dissenting.

The meeting then terminated.

PHOTOGRAPHY AS APPLIED TO ARCHITECTURAL MEASUREMENT AND SURVEYING.*

MOST people are in the habit of looking upon photographs as more or less artistic or unartistic pictures destined to convey impressions more or less accurate or inaccurate of what things look like. Comparatively few people have yet acquired a habit of regarding photographs as accurate measurable records of external facts. The impressions which a picture yields may be, and often are, misleading ; while the relationship which exists between the picture and the objects whose images are depicted is always definite, and a little careful attention in arranging the conditions under which a picture is taken will suffice to make easy the correct interpretation of the picture. What those conditions should be, and how to interpret the picture, will be best understood if we begin by trying to understand what is the geometrical nature of a photograph.

The first fact to notice about a picture is that it is a surface. A photographer can generally arrange to adjust the surface on which to take his picture in almost any position he pleases with reference to the objects he wishes to depict, and within limits he can modify the character of the picture surface.

For most practical purposes it is best to use flat surfaces only, because a flat surface is the simplest possible kind of surface to obtain and to use. Other surfaces such as the inside of a hollow sphere or of a cylinder, might be used for special purposes, but even if such surfaces could be easily obtained and readily adjusted in correct position with reference to the lens at the time of exposure, and to the eye when under subsequent examination, the advantages of such surfaces would be much more than out-balanced by those of the ordinary flat surface for nearly all ordinary purposes.

As regards irregular surfaces there is nothing to be said in their favour. We will therefore consider flat surfaces only.

The first important generalisation we can arrive at is that the picture surface can only be an exact copy of the thing depicted when that also is a similar surface, and only then when the picture surface was parallel to the object surface at the time when the picture was taken.

Before going further it is necessary to have a clear appreciation of this generalisation and of some simple consequences which follow. Most people know that handwriting, manuscript, type-printed matter, and drawings can be copied exactly by photography, and we continually see photographic enlargements which we can perceive at a glance and prove by measurement are proportional in all directions to the originals from which the copies were made.

To illustrate the first elementary principles of our subject, let us first examine a photographic picture of straight lines and right angles arranged to form a set of regular squares. The lines whose images are now shown on the screen were originally ruled with a pen and ink on a flat sheet of paper which is here. That sheet of ruled paper was photographed in the ordinary way, due care having been taken to secure that the paper was fixed flat at the time of exposure and the sensitive plate surface parallel to the paper. A lantern slide was made in this way, and that slide is now in the lantern by which this picture is being projected on the screen. The plans of the slide in the lantern is now vertical and parallel to this screen on which the image is received. There have thus been two photographic operations with different lenses, but the result in each case has been to show all the straight lines as straight lines and all the right angles as right angles. The original ruled drawing was made up entirely of squares, so is the lantern slide picture, so is the picture now on the screen. The squares in the slide are smaller than in the original drawing. Those on the screen are larger, but except in the matter of size all three are alike. There is no perceptible binding of any of the lines, no perceptible enlargement or diminution of any of the angles. This means that there has been no perceptible distortion in any part of the picture. With any good modern lens of the rectilinear type it is the rule that the picture is true and free from any perceptible actual distortion. We will find different degrees of brightness of illumination, and, perhaps, difference in sharpness of definition between the marginal and central regions, but no straight lines will be bent, and no angles altered, and, therefore, no positions wrongly depicted. If the distance of the picture plans from the lens is changed, the size of the squares will change, but not the shape, provided the surfaces are always parallel to each other. For sharp definition the focussing adjustment of the projecting lens may have to be altered, but no distortion will result. By simple measurement with a tape it can be shown that the length of the side of any square will vary in direct proportion to the perpendicular distance from a point inside the lantern lens to the receptive screen, assuming the relative positions of the slide and lens to remain constant, and therefore the area of any square will vary as the square of the distance.

This is the ordinary rule, applicable to all rectilinear radiation from a point, whether it be light, heat, electricity, or any other form of radiant energy. We may, therefore, conveniently regard a photographic picture as a radiant production, every point of which is at the end of a straight line coming from an apical point somewhere in front of the picture. Generally that point is somewhere inside the body of the lens, but it may be outside, and either before or behind the lens, and it is called the station point.

The picture yielded by the lens is the same as would be obtained by a simple pin-hole at the station point. A good lens gives a brighter and more sharply defined picture than a pinhole, but otherwise the pictures are the same in size and outline.

The geometrical relationship between objects and photographic images of the objects can be most easily appreciated if this lens is supposed to be replaced by a pinhole in the right position. It is then evident that the pin-hole aperture will be at the apex of a double cone of rays, the cone on one side of the aperture being made up of rays travelling from the object points to the hole, and the cone on the other side will consist of a prolongation of those rays beyond the hole until they meet the picture surface. (As a matter of fact, with lenses, the apex of the cone of incoming rays is not coincident with the apex of cone of picture rays, but the two cones are similar, and usually the distance between the apices, as not to affect materially the results, except under unusual conditions.)

With this conception always in mind that a photographic picture is a collection of points at the ends of straight lines radiating from the station point in the same directions as corresponding straight rays of light which have originally travelled from the objects depicted to that point or its adjacent counterpart, a correct understanding of many of the problems of photographic geometry becomes simple and easy. It becomes clear at once that when the true position of a picture is known with reference to its station point, any number of direction lines from the station to points on the objects depicted can be ascertained with ease, because they will be the same as the direction lines from the station to the corresponding points on the picture. To fix the actual positions of the object points it is sufficient to know their several directions from a known point and the distances of those points along the direction lines. Generally it is not convenient or easy to determine directly the distance of a point along a radius of direction. The most convenient and best way for general purposes is to find the horizontal distance first, then the altitude, when the actual line or distance will be the hypotenuse of the right angle triangle of which the horizontal distance and altitude are the sides containing the right angle. To find the horizontal distance a method of intersection similar to the plane table method of land surveying is used. Photographs of the same objects are taken from different stations. The direction rays to any point whose position is required are observed and projected on a ground plan, when the intersection of the projected rays will mark the position of the point on the ground plan.

The altitude can then be ascertained by determining from the picture the angle of elevation, and then computing the height which would subtend the observed angle at the distance already ascertained on the ground plan. Also the altitude will be a fourth proportional to three lengths, which can be measured directly. These are :—1. The distance from the station to the projection of the image point on the horizontal trace of the picture plane. 2. The horizontal distance of the point from the station measured in scale feet on the plan. 3. The measured height of the image of the point on the picture above or below the horizon.

Or it may be determined by substituting values in a general formula $h = d \tan, a$ where h is the altitude above or below the station, d is linear horizontal distance, a is the angle of elevation observed from the station and tan, and is $\sqrt{\frac{y^2}{f^2 + x^2}}$ where f is focal distance, and x and y are abscissal measured from the centre on the horizon and principal vertical lines as rectangular co-ordinates.

In practice there are no considerable difficulties, provided we have enough accurate information about the pictures which are used.

Most of the troubles which were experienced in former years in practical photographic survey work (apart from purely photographic difficulties and uncertainties, which were considerable in early days) have been connected with the ascertainment of the essential facts about each picture necessary to be known or ascertained somehow before the picture could be practically used for accurate survey work.

Professors Schiffner, Steiner, Hanck, and other Continental geometricians have published, from time to time, very able, original, and learned investigations of the more intricate geometrical properties of photographs ; and it has been shown how, by aid of the five-point and three-point problems, and other geometrical and analytical methods, it may be possible to ascertain enough necessary facts about a picture to be able to make use of it for defining positions, even though the information, to start with, was defective in various ways ; but for ordinary purposes it is necessary to obtain the requisite information by quicker and simpler means.

The essential information needed may be arranged under a few heads :—First, it is necessary to know from what spot the view was obtained ; in other words, the exact position of the station point. This should be noted when the picture is taken.

Secondly, the position of the plane of projection, or the picture plane, with reference to the station. To define this position with accuracy, we need to know—(*a*) The inclination of the plane to the horizon ; (*b*) the orientation ; (*c*) the distance of the picture plane from the station point.

(*a.*) Is generally vertical. There are many and great advantages in working with truly vertical pictures only for nearly all purposes.

(*b.*) The orientation may be found by reference to images of known points whose images appear in the picture, or the compass bearing may be automatically recorded at the time of exposure.

(*c.*) Is the focal distance or distance line of the perspective. The focal length of the lens used is generally a known and constant quantity for all distant views. For enlargements it has to be computed, and it is generally advisable that the picture should bear on its face marks from which the computation can be easily made.

Thirdly, the traces of the horizon and principal vertical plane intersecting at the centre. In practice there are very great advantages in having these lines automatically traced on the picture. Evidently, also, it is not sufficient to know only the position of the

* A paper read by Mr. J. Bridges Lee, M.A., before the ordinary meeting of the Society of Arts, Wednesday, April 16, 1902. Some portions not intelligible apart from the diagrams are omitted.

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plane of projection with reference to the station, it is necessary to know also the position of the picture in that plane.

The centre and the principal horizontal and vertical lines fix that position. The horizon line in every case marks the level of the station right across the picture, and forms the base from which all altitudes can be measured above or below the level of the station. If the points bisected by a horizon line be plotted on a plan, a line through those points will be a contour line of the same altitude as the station. By moving a station a known number of feet up and down, other contour lines can be obtained at any desired distances apart.

The methods so far considered and explained in outline, relate only to the fixing of points on a ground plan by the methods of intersections and of elevation by the particular methods described. These methods are almost universally applicable, and with moderate care they yield very accurate results with much less expenditure of time and money and effort than would be needed for an ordinary survey of the same ground with a plane table, or any of the other known methods of surveying. In Canada this method has been largely used, and it has been found that the actual money saving from using the photographic method was then two-thirds of the computed cost of a plane table survey. A similar saving has been computed as the result of using this method for the survey of the Trans-Baikal Railway in Siberia, and it seems reasonable to believe that with the improved instrumental appliances of the present time, and others perhaps to follow, that the saving of expense for surveys hereafter will be from 80 to 90, or perhaps even 95 per cent. of the cost of similar surveys in the past by old-fashioned methods.

When dealing with landscapes it is necessary to work for the most part by plotting selected points only, and sketching in details between the plotted points. Photographs from different stations over the same area give to the surveyor in his office the general aspect of the region, as seen from different points, for immediate comparison. They help him very much to fill in details by estimation, and provide him with ready means for checking his own or others maps by setting off any number of rays he may please to points whose positions may be in any doubt.

Existing maps cannot be checked, or corrected, or amplified by any other means without the necessity for first sending an expedition to the place, which is not always possible for military or other reasons. If a set of good survey photographs is obtained they can be brought into use at any time and anywhere, to yield just any topographical information which is wanted at the time when it is wanted, including, among other things, reliable information about the appearance and general character of the ground, which is often very important to know.

Sometimes, in landscape views, there are to be found level and perpendicular surfaces, and straight lines and rectangles, which may be conveniently dealt with on principles of perspective, a few of which it may be convenient to refer to now in connexion with the interpretation of photographs of buildings.

In the early part of this paper it was shown how a surface parallel to the picture plane gives an image similar to itself in all directions and proportions, the scale being the only variable; and it has been shown that the scale is simply the ratio of two measured distances—(1) from the picture station to the picture plane which is the same thing as the working focal distance; (2) from the object station to the object plane. When dealing with buildings, it is often possible for the photographer, without difficulty or much loss of time, to measure directly with a tape the perpendicular distance from the diaphragm of his lens to the wall of the building to be photographed. This distance can be noted on the picture. The scale can then be calculated and constructed in a few minutes, and all distances on the surface elevation can be measured directly with a pair of compasses and that scale.

Distances on parallel surfaces nearer or further away, such as projections, porches, or deep set windows or other recesses, will require different scales of measurement according to their distances in advance of or behind the principal surface, or the same scale can be used for measurement, and the results divided or multiplied by a constant computed for the difference. Another way to get the scale is to place a rod of known length in close contact with the surface where its image will be entirely included in the photograph.

Sometimes it is not convenient to walk up to a building to measure the distance to it or to place a measured length against it. A very efficient plan then is to shift the camera a measured distance to the right or left parallel to the face of the building, and take a second picture, when if due care has been taken to set up the camera perfectly square in both instances the images of the vertical hair on the face of the building will include between them a slice exactly as broad as the measured distance between the two camera stations. [This plan for obtaining regular slices of views bounded by parallel vertical planes may be used with advantage sometimes when dealing with landscape. It is, however, very necessary to be extremely careful about the orientation to secure exact parallelism.]

If the ground on which the camera stands is level with the base of the building, the height of the lens above the ground will be the same as the height where the horizon line cuts the building. This method is not often very satisfactory in practice, because of uncertainty in so many cases about the identity of the ground level.

One way to investigate flat-surface areas is to apply what is known as the method of squares. If we imagine a plane area to be entirely made up of small squares, then the position of any point in the area is sufficiently determined if it is known in which square it is located and what is its position in the square. When dealing with a front view it is sufficient to superpose on the picture a sheet of glass on which have been ruled or photographed a network of regular squares in elevation.

If the focal distance of the picture be known it is a very simple matter to compute the scale value of the squares for different distances of the object surface. When free access can be had to the building and its surroundings it should be easy in most cases to obtain pictures of such dimensions that the measuring squares shall cover definite, convenient, integral areas.

Next in order of simplicity of measurement to a simple frontal view of a plane surface will be a horizontal surface or plan. [The image was thrown on the screen of a perspective view of a ground plane divided into regular squares. This diagram was originally drawn by hand on a flat sheet of paper, in accordance with the well-known rules of perspective, and it had been photographed for projection.]

A photographic picture on a vertical plate of a regular horizontal square-tiled pavement would present a similar appearance. On a ground plan, all the small units of area included between the lines represent squares of equal dimensions, and it is evident that if an object is seen to be based in any particular square, its position is known, and can be plotted on square-ruled section paper without any trouble. The degree of accuracy will depend largely upon the size of the squares in perspective. In practice it is not convenient to make the squares excessively small, because of the additional difficulty of identification which may result. It is best to work with fair-sized squares; and having ascertained in which square a point lies, to take special care to ascertain its exact position in that square. For practical work regular series of perspective squares may be engraved or photographed on flat sheets of glass to make what are called perspectometers, which can be laid in position on the photographs with the scale surface next the picture face.

These perspectometers need to be specially constructed with precise reference to the focal length of the lens in each case. The image now thrown on the screen shows what a perspectometer is like. A study of the perspectometer is instructive also in the way of showing the general nature of photographic distortion of objects whose outlines lie in receding planes.

Time will not permit of the discussion of the interesting subject of so-called photographic distortion to-night. It must suffice for the moment to say that whatever the apparent distortions may be, they are all in strict accord with the regular law and principles of geometric perspective.

If a camera is equally constructed, and a flat surface is squarely faced, there will be no apparent distortion at all in the image. If there are receding surfaces in the object they will be fore-shortened in the picture, and distant objects may appear too small, and near ones too large in proportion. These are facts which an experienced photographer learns by practice, and which he must bear in mind when seeking to produce pleasing or artistic pictures. The laws on which these facts depend are of universal application, and if rightly understood and applied with judgment, they enormously enhance the value of photography as a means of collecting and recording information about objects, and at the same time enable us correctly to read and interpret photographs as condensed accurate records of facts such as few other documents and no mere written descriptions can rival.

The method of squares which has been spoken of as applicable to the measurement and plotting of elevations and plans can be applied also for the measurement of other receding flat surfaces such as the roofs or walls of buildings . . .

If neither a specially-prepared room nor screens are available for practice study, a level roadway between parallel brick walls or regular flat-fronted houses will answer very well for early experiments, which will soon lead to a clear perception of the fact that photographs are, in reality, true perspectives. It will soon be found, by experiment, that the image of every identifiable point is located where theory indicates that it should be, and where, indeed, it must be in obedience to immutable law, and it will be realised that just as it is possible to predict the exact arrangement of image points on a picture, from the known position of the object points, so conversely, it is possible to reason back from the picture to the object. Sooner or later the time will come when photographic projection will be systematically employed for teaching perspective, and it will be employed practically, on a large scale, for projecting images from one plane to another. Frontal planes or elevations can be directly projected in angular perspective, and *vice versâ*: and vertically inclined planes can be directly projected in plan or elevation.

If we have a perspective surface to measure, then squares in similar perspective, superposed in correct position upon the picture image, afford, in many cases, convenient means of measurement, and, provided sufficient careful attention be given to necessary details, fairly accurate measurements and approximately correct outlines of objects can be thus obtained, but in a general way, unless the dimensions to be ascertained are in planes parallel to the picture plane, and at known or easily ascertainable distances from the station. It is not wise to depend on one picture alone for working out dimensions by perspective rules. One chief reason for this caution is that the elements available on a single picture for determining depth or distance are not sufficient to secure accuracy except for very near distances. The angles between visual direction lines and the reference planes of a single perspective, are much too acute or obtuse to yield trustworthy intersections for distance.

For fixing positions by the intersection of direction lines a base is required whose length must bear some reasonable relation to the distance of the point to be fixed, and two photographs at least from different stations should be used for fixing positions. In practice a third view from a third station should be used when possible to check the results. Rectangular intersections are best and least need checking. These considerations are not at all new. Far from it. The reason for re-introducing them now is to correct possible misapprehension of what has been said before. Perspective is a fascinating and instructive subject for study, and it is quite legitimate to employ its principles for the investigation of external objects as depicted by photography, and no doubt the appropriate application of those principles will reveal to the accomplished student a much larger proportion of the geometric truths recorded by photography than will be revealed to the uninitiated, but expectation must not be pitched too high or in unreasonable directions or it will certainly lead to disappointment and discouragement. We must not expect to obtain full knowledge of unknown objects of three dimensions by aid of a single photograph, or even a number of photographs from a single point of view. To study unknown objects thoroughly we need to be able to examine them from several different points of view, and to compare the views.

The use of photography does not obliterate this necessity, though it helps very decidedly towards correct final conclusions because it records faithfully, and in obedience to definite

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exact laws which can be ascertained, the appearance observed at every station, and these views from different stations can be brought close together and directly compared.

THE ARCHITECTURAL ASSOCIATION: MEMBERS' SUPPER.

THE General Committee of the Architectural Association decided some time ago to substitute an informal supper for the usual full-dress dinner, and on Friday last week the innovation was given effect to at the Hotel Great Central, Marylebone-road, Mr. W. H. Seth-Smith, President, occupying the chair. Among those present were Messrs. Wm. Emerson, President of the Royal Institute of British Architects, G. H. Fellowes Prynne, H. T. Hare, F. R. Farrow, Cole A. Adams, E. T. Hall, A. T. Bolton, W. A. Pite, H. Lovegrove, Louis Ambler, F. G. F. Hooper, R. H. Weymouth, G. B. Carvill, R. S. Balfour, H. P. G. Maule, and F. T. W. Goldsmith.

The substitution of a supper for the annual dinner was not the only innovation, for it had also been decided to dispense with toasts and speeches, the desire being, as the Chairman stated in a few words after the repast, to have a Bohemian dinner. "We are all artists," said the Chairman, "but unfortunately our art is of a practical nature; yet, for all that, we are Bohemians at heart; for the time being we are going to revert to our nature and become Bohemians."

There was one toast, however, which it was decided to have, *i.e.*, "The King," and this was briefly proposed by the Chairman and heartily honoured.

The Chairman also briefly and heartily welcomed the guests and Mr. H. Passmore, who has recently returned from the South African war. He also referred to the absence of Mr. H. A. Satchell, the editor of the "Notes," owing to a domestic bereavement, and complimented that gentleman on the able way in which he conducts the journal. Continuing, the Chairman said they specially welcomed their guest, the President of the Institute, and they felt honoured that he had come amongst them that evening.

Mr. Emerson said the Chairman had placed him in a wrong category. He was a member of the Association, and he was very glad to be present, and he hoped to have the pleasure of being with them at many more of their festive gatherings, which were amongst the most pleasant he ever attended.

Musical and other selections were given during the evening by Dr. F. Byrd Page and Messrs. Dalton Baker, F. D. Clapham, C. J. Draper, and Harrison Hill.

In the course of the evening Mr. G. H. Fellowes Prynne said it was impossible not to have one toast, and that was "The Chairman," and he desired to propose it very heartily.

The toast having been received with musical honours,

The Chairman suitably replied. He said he appreciated the assistance the Association had given him, and especially the Committee to whom much of the success of the Association was due. It was only within the last few weeks, during his absence from the work of the Association, that he realised how easily everything went along. It had been a great pleasure to him to do what little he had done for the Association, and he cherished their kindly feeling and sympathy.

On the motion of the Chairman, hearty thanks were accorded to Mr. G. B. Carvill and his friends for organising the excellent entertainment that was given during the evening.

The attendance was larger than at previous dinners of the Association, and those present spent a very pleasant evening. The General Committee should feel satisfied with the result of the innovation.

The Soirée.

The annual members' soirée (smoking) will be held at St. George's Hall on Wednesday, June 4, at 8 p.m. A musical play will be performed, entitled "Arctia: A Legend of the Far North," written by Mr. Gervase Bailey, music by Mr. Leonard Butler. A dress rehearsal (ladies' night) will be given on Tuesday, June 3, at 8 p.m.

DEVONPORT DOCKYARD ORPHANAGE.—For the new home, the Board of the Devonport Royal Dockyard Orphan Asylum have secured a site in Milehouse-road. The work has just been commenced. Mr. Snell is the architect.

PROVISION OF MEANS OF ESCAPE IN CASE OF FIRE.

THE Building Act Committee of the London County Council brought up the following report at their meeting on Tuesday, the recommendation being agreed to:—

"By the provisions of the Factory and Workshop Acts, 1891 and 1895, the duty was imposed upon the Council of seeing that each factory or workshop situated within the Administrative County of London, in which more than forty persons were employed, was provided on the stories above the ground floor with such means of escape in case of fire for the persons employed therein as could reasonably be required in the circumstances of each case. With a view to assisting owners (1) of new buildings in making applications for the Council's certificate that their premises were provided with proper means of escape in case of fire; (2) of old buildings in submitting proposals to comply with the requirements of the Council, it was found desirable to draw up a statement as to the means of escape that would in general be required. Such a statement was adopted by the Council on June 13, 1899, but, in consequence of the passing of the Factory and Workshop Act, 1901, it is necessary to make certain alterations in it, the principal one being that means of escape are now required to be provided from all floors instead of from all floors above the ground floor. The other alterations are in the main rendered necessary by the substitution of the Act of 1901 for the earlier Acts. We recommend that the Council do approve the following statement with reference to its requirements in respect of the means of escape in case of fire from factories, workshops, &c., in accordance with the provision of the Factory and Workshop Act, 1901":—

"By the provisions of Sections 14, 103 (1) (*d*) and 153 (1) of the Factory and Workshop Act, 1901, the duty is imposed upon the London County Council of seeing that each factory, workshop, or laundry situated within the Administrative County of London in which more than forty persons are employed, is provided with such means of escape in case of fire for the persons employed therein, as can reasonably be required in the circumstances of each case.

The Council approved the following statement with reference to the requirements in respect of the means of escape in case of fire to be provided in accordance with the provisions of the above Act, with a view to assisting factory owners and others in making application for the Council's certificate, or in submitting proposals to comply with the Council's requirements in respect thereof. 'This statement must not, however, be taken as binding upon the Council, but only as a general guide or indication, since each case is, after full consideration of the varying circumstances, dealt with upon its merits; and nothing herein contained must be taken as in any way interfering with or derogating from the powers of the Home Office, the Council, the district surveyors, or of any other authority whatsoever under the Factory Act, the London Building Acts, or any other Act, or under any by-laws that may be made under section 15, section 153, sub-section 3, of the Factory and Workshop Act, 1901, or under any by-laws or regulations relating to the construction of buildings or otherwise, or as constituting any consent, sanction, allowance or permission under any such Act, by-law or regulation, but all such Acts, by-laws and regulations may be fully observed and complied with notwithstanding anything herein contained.'

Applications.

1. Applications for the Council's certificate in respect of the means of escape from new buildings, and applications with proposals to meet the Council's requirements in respect of the means of escape from old buildings should state:—

(*a*) The number of persons employed or to be employed on the premises, specifying the number of males and females employed or to be employed on each floor.

(*b*) The trade carried on or to be carried on on each floor, with particulars of machinery, power, &c.

(*c*) In the case of existing buildings used as factories, whether the premises were erected before January, 1892, and in the case of workshops and laundries, whether erected before January, 1896.

(*d*) The name and address of the owner.

(*e*) Particulars of the occupation of the building if existing, and if any part is used otherwise than as a factory or workshop or laundry, particulars of the tenancy of such part should be furnished.

2. Applications should be accompanied by complete plans and sections drawn on the unglazed side of tracing linen to ⅛-in. or ¼-in. scale (½-in. scale preferred), and by a block plan to a small scale showing the premises and the surrounding buildings and thoroughfares, such block plan to have the north point indicated.

Means of Escape.

3. The number of staircases required depends, *inter alia*, upon the following circumstances:—

(*a*) The area of the building.

(*b*) The number of persons employed or which could be employed.

(*c*) The disposal of the workpeople.

(*d*) The alternative means of escape which may be available.

4. It may, however, be laid down as a general principle (subject to the exceptions hereinafter mentioned) that distinct and separate alternative means of escape, exclusive of windows, loop-hole doors, &c., are required from each floor, by one of the following means:—

(*a*) A second staircase in the same block.

(*b*) A proper staircase in another block, to which access is available on all the floors by proper openings in the party or division walls, or by external communication.

(*c*) Open iron bridges where the blocks are not adjoining each other.

5. The means of escape from each of the floor levels should be placed as far apart as possible.

6. In all cases where practicable, some means of escape from the roof of the building to the roof of adjoining premises should be provided.

7. In small and inextensive premises, and in some cases where it is possible to provide a staircase in a central position, one properly inclosed staircase, constructed of incombustible materials, may be accepted; but in all cases where only one staircase is provided, some means of escape from the roof to the roof of adjoining premises, *must* be provided.

Internal Staircases.

8. Staircases should be placed next to an outer wall, and must be so arranged as to deliver by means of a doorway, not less than 4 ft. 6 *in.* wide in the clear when the doors are open, direct into the outer air at the ground level into a public way or thoroughfare or some large open space. Staircases must also be so arranged that persons enter them from any floor level in the same direction as persons descending the staircases.

9. Staircases must be properly lighted and ventilated by windows.

10. Staircases, including landings and passages from one flight to another, must be inclosed with newel and inclosing walls, not less than 9 in. thick, carried up above the roof and ceiled with iron and concrete.

11. Staircases must be constructed of incombustible materials, with solid square or spandrel steps, arranged in straight flights, without winders; each flight must consist of not more than fifteen steps, which must be supported at both ends on brickwork, and landings must be provided at the top and bottom of each flight and between the flights. The steps and landings must be of the same width as the staircase (*see* No. 14) and not less than 6 in. thick. In the case of spandrel steps, however, the thickness at the smallest part may be set out as in No. 16.

12. The treads of the staircases must be not less than 10 in. wide clear of nosings, and the risers not more than 7½ *in.* high.

13. Staircases must be provided with handrails fixed upon both sides thereof and continued round the landings and chased into the ends of the newel walls.

14. The width of the staircases is to be regulated as follows:—

(*a*) Where the premises are adapted for the employment of less than 200 persons on the floors above the ground floor, the staircases must be not less than 3 ft. 6 in. wide.

(*b*) Where the premises are adapted for more than 200 persons on the floors above the ground floor, or where more than 100 persons are employed on any one floor above the ground floor, the staircases must be not less than 4 ft. 6 in. wide.

15. Staircases must in all cases be connected with all floors and the roof by means of doorways of the same width in the clear when the doors are open as the staircases.

16. Spandrel steps, where used, must be of the following thickness:—

(*a*) For 3 ft. 6 in. staircases, not less than 3 in. thick in the smallest part.

(*b*) For 4 ft. 6 in. staircases, not less than 4½ in. thick in the smallest part.

17. All doorways to staircases must be fitted with doors of fire-resisting materials (solid teak or oak 2 in. thick or other approved material) in two folds, hung so as to open in the direction of exit or to swing both ways clear of steps, landings, passageways, and footways; such doors must be fitted with springs, weights, or other approved appliances to close them after use, and, if required to be fastened during the time the workpeople are upon the premises, be fitted during such time with automatic bolts only, so that the doors open by pressure from the inside.

18. In the case of old buildings* (in respect of which the Council is not required to issue a certificate) where there is a distinct and separate alternative means of escape provided to the satisfaction

* By the term "old buildings" is meant those of which the construction was begun before—
In the case of factories, January 1, 1892.
In the case of workshops and laundries, January 1, 1896.

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of the Council, from each of the upper floors, the inclosed staircase may be constructed of teak or oak, not less than 2 in. thick, including the treads, strings, carriages, bearers, landings, joists, and floors, the risers to be not less than 1 in. thick, but no fir or pine must be used; and the inclosure to the staircase may be a solid partition of incombustible material at least 3 in. thick; but such staircase must, in all other respects, be formed and arranged as required for a staircase for a new building as regards width, going, treads, risers, doors, handrails, &c. (see Nos. 8-17).

External Staircases.

19. In cases in which external iron staircases are accepted by the Council as means of escape they must be constructed with dead bearings and without cantilever work.

20. They must comply with the requirements Nos. 8-17 as regards width, going, width of treads, height of risers, doors, handrails, &c.

21. They must deliver into the outer air at the ground level into a public way or thoroughfare, or some large open space.

22. Where an iron staircase is in general use the treads must be of approved non-slippery material, as distinguished from perforated iron or chequered iron plates.

23. All windows and similar openings by, or near, any such staircases must be protected with kiln wire, or glazed with a combination of glass and wire or other approved fire-resisting glazing.

General.

24. Proper guard rails must be provided to the routes of escape on roofs, &c, where necessary, to the satisfaction of the Council.

25. Clear gangways, at least 3 ft. 6 in. wide, must be kept up to, and between, all staircases, bridges, and exits on all floors.

26. All doorways, and all passageways, must, where of a less width than 3 ft. 6 in. be increased to that width.

27. All doors usable as means of exit must be made so as to open in the direction of exit, or to swing both ways clear of steps, landings, passageways, &c.

28. All such doors must, if required to be fastened during the time the workpeople are upon the premises, be fitted during such time with automatic bolts only.

29. Lifts should be inclosed all up with brickwork 9 in. thick, or with incombustible material of approved quality and thickness, and fitted with iron or other fire-resisting doors, unless, with the approval of the Council, such lifts be inclosed with fire-resisting materials to a height of 4 ft. above each floor level, and above this with stout wire-mesh guard.

30. Lifts must be kept at some distance from staircases, and must in no case be connected directly therewith by means of openings or otherwise.

31. All windows on the floors above the ground floor, facing the public way, street, thoroughfare, or open space, must be made to open easily at sill level to a sufficient height and width to allow a full-grown person to pass through in case of need."

COMPETITIONS.

WESLEYAN METHODIST CHAPEL, ROTHERHAM.—The building committee of the new chapel of the Wesleyan Methodists of Rotherham met recently to adjudicate on competitive plans which had been prepared by four architects. After a long examination the committee proceeded to vote by ballot, when it was found there was a majority in favour of the design of Messrs. Morley & Son, of Bradford. The second place, according to vote, was assigned to the plan of Mr. J. E. Knight, of Rotherham. The third in order of preference was the design of Mr. J. Smith, of Sheffield.

DESIGNS FOR WALL PAPERS.—In the illustrations of these given last week, the "Japanese Rose" design should have been given as "by A. F. Vigers," not "A. F. Rose." The mistake was not ours; the name was written so on the example sent to us.

BATH ELECTRIC LIGHT WORKS.—On the 1st inst. Mr. Bicknell, Local Government Board inspector, held an inquiry at the Bath Guildhall into the application by the Bath Corporation for power to borrow 25,000*l.* in respect of electric light works. Mr. J. Allsebrook Simon appeared for the Corporation, and explained that 12,000*l.* of the amount in question was money already expended, but admitted this was a serious excess of sanction, which had arisen owing to the Corporation having to meet the constantly increasing demands. Mr. Teague, electrical engineer, said the new plant would probably carry the city through next and the following winters, but expected that in a year or eighteen months they would have to come for a loan for further plant. Mr. Manville, electrical expert, said it was proposed to introduce continuous current for the whole of the centre of the city, and to lay extensions in the suburban areas with the alternating current, which was better adapted for that purpose. It was not with any idea of making the plant suitable for electric trams that the continuous current was being introduced.

Illustrations.

ENTRANCE TO THE SCOTTISH NATIONAL PORTRAIT GALLERY.

THIS view represents the principal entrance to the Scottish National Portrait Gallery and Museum of Antiquities, erected by the Board of Manufactures from funds generously given by the late Mr. John Ritchie Findlay, of Aberlour.

In preparing the designs for this building special attention was given to the desirability of bringing sculpture into a closer alliance than hitherto with architecture.

The designs were prepared by Dr. Rowand Anderson, and the sculpture of this part of the building was executed by Mr. Birnie Rhind with the exception of one of the figures, which was executed by the late Mr. John Rhind.

In the quatrefoil panel over the doorway the sculpture represents the Royal Arms of Scotland as adopted by the Board of Manufactures, and in the cusped panels in the spandrels of the principal arch are shown busts symbolical of "Peace" and "War." In the three panels under the sill of the main window, the centre contains the "Fine Arts," on the right hand are the "Ruder Arts," and on the left the "Sciences." In the large panel above the windows on the gable the subjects represent "Scotland Enthroned," supported on the right by a figure symbolical of "Industry," and on the left by one representing "Religion." In the quatrefoil panel in the main gable above is an early rendering of the "Royal Arms of Scotland," and the figure forming the finial is that of "Fame," inscribing the names in the book of history. In the upper two niches, that on the right holds the figure of "Malcolm Canmore," one of the early Kings of Scotland, while the other shows his Consort, "Queen Margaret," who holds in her hand a model of Dunfermline Abbey, indicative of what she did for the Christian faith in Scotland. In the lower niches, that under King Malcolm is "Sir William Wallace," and on his left "King Robert the Bruce."

THE BUCCLEUCH MONUMENT, EDINBURGH.

THIS monument was erected by friends and fellow-countrymen of the late Duke of Buccleuch. It stands in the open space at the west end of St. Giles Cathedral, Edinburgh.

The figure, by the late Sir Edgar Boehm, is in bronze. The architectural detail of the monument is also in bronze. The sculptured panels represent incidents in the history of the Buccleuch family, and are by various artists. The bucks surrounding the principal pedestal support shields displaying the heraldry of the family.

The monument was designed by Dr. Rowand Anderson, of Edinburgh.

FOXCOMBE, NEAR OXFORD.

THE illustration shows a country house not entirely new, for the plan incorporates a small house now occupying a beautiful position on Boar's Hill.

The scheme provides a large hall, with open timber roof and mullioned windows, the staircase and screen being at one end of this hall. At the other end are the billiard-room and morning room, with bedrooms above. These latter are approached by their own turret stairs as well as by a gallery in the hall. Bachelors' rooms are provided in the upper part of the tower, the lower stage of which forms a gateway or carriage porch. The building is to be roofed with Colleyweston stone.

Messrs. Ernest George & Yeates are the architects; and Messrs. Hayward & Wooster, of Bath, are the contractors.

The drawing is exhibited at the Royal Academy.

OAK REREDOS, LEWES.

THE drawing shows the oak reredos in the Church of St. Thomas, at Cliffe, Lewes, Sussex, together with the panelling round the sanctuary. The space at the east end of the chancel being somewhat contracted, advantage was taken of the recess of the east window and the reredos was set back into the recess, the treatment being continued at the sides. Under these conditions the "eastward position" in celebrating became a necessity.

The brattishing, cornice, and diaper work was very carefully carried out, the general effect being richness and delicacy. Mr. Hems, of Exeter, was the carver responsible for the work, the cost of the reredos proper and side wings being 80*l.* The altar, though it formed part of the complete design, was delayed for want of funds, and has not yet been executed. At the time several structural alterations in the church were considered more necessary. The side of the chancel arch had given way, and it was entirely reconstructed. Later the chancel was decorated with colour. The design for the reredos was supplied, and the several structural works and decoration carried out, by Mr. Thos. Garratt, architect, Kingston Hill.

BATTERSEA WORKING MEN'S DWELLINGS COMPETITION.

THIS is No. 1 of the five sets of plans, by Messrs. G. T. Smith & Weald, to which the first premium in the above-named competition was awarded.

We have been unable to get any information from the architects in regard to it, and must refer the reader to our own remarks on the competition drawings in our issue of April 26.

METROPOLITAN ASYLUMS BOARD.

THE fortnightly meeting of this Board was held on Saturday, Mr. Henson presiding.

The Works Committee submitted an amended statement showing that the expenditure incurred in respect of the erection and fitting up of the new laundry, boiler-house, and rain-water reservoir at the North-Eastern Hospital had been 15,323*l.* 17s. 10d., including balances of 200*l.* due to Messrs. McCormick & Sons, 100*l.* to Messrs. Bradford & Co., and 176*l.* 19s. 4d. to the architects. Of the total sum of 15,323*l.* 17s. 10d. thus expended, 9,955*l.* 8s. 10d. had been in respect of Messrs. McCormick & Sons' contract for the building work, and 4,586*l.* 19s 6d. in respect of Messrs. Bradford's contract for laundry machinery. The amount of expenditure sanctioned by the Local Government Board was 14,801*l.*, but in the course of carrying out this contract, certain extras were ordered and reported to the managers from time to time—such extra works consisting of 328*l.* for improving the airing room accommodation, 451*l.* for extra concrete foundations, and other matters connected with the laundry machinery, and 394*l.* for a new trolley road between the old and new buildings. A provision for contingencies in the contract partly met the cost of these extra works, but on making up the final statement of account, it appeared that the amount sanctioned by the Local Government Board has been exceeded by 522*l.* 17s. 10d.

The Board adopted the report.

The Ambulance Committee reported that, pursuant to authority, they had obtained the following tenders for the erection at Leavesden Asylum of a boot-room and a building comprising a hair-picking room and accommodation for a steam disinfector, in accordance with plans approved by the Managers of the Local Government Board:—

Building Work.—Tonge, R. L., Watford, 1,620*l.*; Wiggs, G., Watford, 1,692*l.*; Tyler & White, Watford, 1,712*l.* 15s. 2d.; Dupont & Co., Watford (first tender 1,842*l.* 4s. 5d.), 1,746 10s. 7d.; Gardner & Hazell, Islington, N., 1,763*l.* 12s. 9d.; Watkins, H. B., Watford, 1,791*l.*; Clark Bros., Watford (first tender, 1,873*l.* 11s. 4d.), 1,807*l.* 10s. 8d.; Wall, E., Lower Tooting, 1,866*l.*; Payne, J., Hemel Hempstead, 1,963*l.*; Moscrip, S. W., Willesden Junction, 2,061*l.* 1s. 11d. The first advertisement for the building work produced only three tenders, the lowest of which was Mr. Tonge's at 1,620, who subsequently stated that he saw no reason to alter it. For engineering work the tenders were:—The Watford Engineering Works, Watford, 188*l.*; Werner, Pfleiderer & Perkins, Ltd., Regent-square, W.C. 214*l.*; May, J. & F., London, W.C., 216*l.*; Dawson & Co., Ltd., Stalybridge, 261*l.*; Joel & Potter United, Ltd., South Moulton-street, W., 260*l.*; Paragon Heating Co., Birmingham, 270*l.*; Beavan & Sons, Victoria-street, Westminster, S.W., 270*l.*; Crittall & Co., Noel-street, W., 313*l.*; Haden & Sons, Trowbridge, 318*l.*; Herring & Son, Chertsey, 320; Greenwood & Co., Dobeross, near Oldham, 340*l.*; Fairbrother & Co., Fann-street, E.C., 347*l.*; Brightside Foundry & Engineering Co., Ltd., Victoria-street, Westminster, S.W., 387*l.*; Crowe, R. A., Manchester, 402*l.*; Reed & Sons, Ltd., Brighton, 445*l.*; Thomas & Taylor, Ltd., London, N., 450*l.*; Williams & Sons, Cardiff, 460*l.*; Esson, C., Fetter-

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lane, E.C., 545*l.*; Clarke, R., Featherstone-street, E.C., 551*l.*

One of the reasons that induced the Committee to re-advertise for tenders for the building work was the fact that the Engineer's estimate of cost was 1,550*l.*, made up as follows :—1,150*l.* for hair picking building and 400*l.* for bootroom, or 1,370*l.* for building work and 180*l.* for engineering. It would, therefore, be seen that the lowest tender for building work was 250*l.* higher than the Engineer's estimate of 1,370*l.*, and in view of the fact that the Local Government Board had limited their sanction to an expenditure of 1,550*l.* on the buildings in question, viz., 1,150*l.* for the hair-picking building and 400*l.* for the bootroom, which estimated amounts included engineering work, they thought that before any tenders were definitely accepted, the Board's consent should be obtained to the increased cost. They, therefore, submitted the following recommendations :—

"That, provided the Local Government Board consent to authorise the expenditure of an additional sum of not less than 258*l.* in the provision of a hair-picking building and a boot-room at Leavesden Asylum, the following tenders be accepted and the seal of the Managers affixed to the contracts :—Mr. R. L. Tonge, for building work, 1,620*l.*; the Watford Engineering Works, for engineering work, 188*l.*"

The recommendation was agreed to.

ENGINEERING SOCIETIES.

THE INSTITUTION OF CIVIL ENGINEERS.—At the annual meeting of the Institution of Civil Engineers, held on Tuesday evening, Mr. Charles Hawksley, President, in the chair, the result of the ballot for the election of officers was declared as follows :—President, Mr. J. C. Hawkshaw, M.A.; Vice-Presidents, Sir William White, K.C.B., Mr. F. W. Webb, Sir Guilford Molesworth, K.C.I.E., and Sir Alexander Binnie ; other Members of Council, Mr. James Barton (Dundalk), Mr. Horace Bell, Mr. B. Hall Blyth (Edinburgh), Mr. Cuthbert A. Brereton, Mr. John Brown (Cape Town), Mr. R. Elliott Cooper, Colonel R. E. B. Crompton, Mr. Cecil West Darley, Mr. George F. Deacon, Mr. W. R. Galbraith, Mr. E. P. Hannaford (Montreal), Mr. G. H. Hill, Mr. J. C. Inglis, Mr. G. R. Jebb (Birmingham), Dr. Alexander B. W. Kennedy, Sir William Thomas Lewis (Cardiff), Mr. J. A. McDonald (Derby), Mr. William Matthews, C.M.G., Mr. William Shelford, C.M.G., Mr. Alexander Siemens, Mr. Henry C. Stanley (Brisbane), Mr. John Strain (Glasgow), Mr. John I. Thornycroft, Professor W. C. Unwin, B.Sc., Mr. F. R. Upcott, C.S.I., Sir Leader Williams (Manchester).

SOCIETY OF ENGINEERS—At a meeting at the Royal United Service Institution, Whitehall, on May 5, Mr. Percy Griffith, President, in the chair, a paper was read on "Recent Blast-Furnace Practice," by Mr. Brierley D. Healey. The author dealt *seriatim* with the plant and machinery of an ironworks from the blast furnace to the pig-bed and slag-removal appliances, and drew comparisons between old and new methods of working, showing what great advances had been made during the past forty years in blast-furnace practice. For instance, the average output of British furnaces forty years ago was about 200 tons of pig-iron per week, but now it is not difficult to obtain 200 tons per day, and as much as 305 tons has been smelted in one day, and 1,735 tons in one week, at a modern works. The author pointed out that the production of pig-iron in Great Britain in 1901 was 7,385,198 tons, whilst in the United States during the same year it was 15,878,354 tons. In the year 1885 Great Britain produced 7,415,469 tons, and the United States 4,044,526 tons. The author described the latest improvements in blast-furnace plant, including the Ford and Moncur and the Stevenson and Evans hot-blast stoves ; the Gjers and Harrison temperature equaliser ; the Thwaite-Gardner blast-furnace gas-engine and gas-treatment plant ; the Foster tuyère cooling system ; the author's furnace hoist and charging hopper ; the Thwaite blast-furnace bell-top ; the Hawdon pig-casting machine ; and the Dewhurst slag ladle. He then made some very practical references to the need for utilising the by-products, and particularly to the use of the gases from the blast furnaces for driving gas-engines for blowing purposes and for electric lighting and power for the minor machines. He mentioned a case where the gases would not burn in the steam boilers without the help of solid fuel, but which were used in the gas blowing engines at the same works without any difficulty whatever. The author showed the importance of securing more uniform temperature for the hot blast by the use of equalisers, and of increasing the output of strongly built existing furnaces by slight alteration of crucible, and an increased volume of blast obtainable from their own gases. He stated that the gas from a 1,500 ton per week furnace working on coke, after allowing seven-twentieths for heating the blast, 900 i.h.p. for gas-driven blowing engines, and 100 i.h.p. for charging the furnace and clearing away the slag, left a surplus of 5,000 i.h.p. for electrical energy. That would be more than sufficient to drive the whole of the machinery of an adjoining steel rolling mill of equal capacity to the blast-furnace output, and also to provide for lighting the works, offices, and workshops. From calculations submitted by the author it was assumed by him that 6 i.h.p. per hour was obtainable for every ton of iron produced per week in coke-fed furnaces. From the total power thus ascertained provision has to be made for heating and compressing the blast and for working the plant, as shown in the 1,500-ton example. He stated that designs were being prepared for the rebuilding of one works in Staffordshire, where a very special feature will be the absence of steam boilers, the power obtainable from the furnace gases being fully utilised.

ARCHITECTURAL SOCIETIES.

LEICESTER AND LEICESTERSHIRE SOCIETY OF ARCHITECTS.—The twenty-ninth annual Report of this Society shows that the Society now numbers 104 members, consisting of eleven honorary members, forty-six full members, thirteen associates, twenty-one assistants, and thirteen pupil members. The very excellent address given by the President, Mr. S. Perkins Pick, on September 19, 1901, is given in full, and contains much advice that is well worth the attention of young architects. The Report is accompanied by some measured drawings of old buildings in Leicester. In type and make-up it is a model pamphlet of its kind.

EDINBURGH ARCHITECTURAL ASSOCIATION.—On Saturday last week the members of the Edinburgh Architectural Association visited the Broch of Tappoch, situated on the summit of the Torwood, about three miles north of Larbert. It is one of the few existing in the south, their chief locality being the four northern counties of Scotland, where they exist in some hundreds, while in the southern counties there are only about six or eight. The Tappoch is one of the strongest of the brochs, having walls about 22 ft. thick, and an external diameter of about 80 ft., and its ground floor is absolutely of solid masonry, while it was surrounded by two strong walls, of which considerable remains still exist. All knowledge of this ancient structure was lost till about forty years ago, when its ruins, then a grassy mound, were explored and laid open to view. The period of the erection of the brochs has been assigned to the four or five centuries following the withdrawal of the Roman troops from Britain. After spending nearly an hour at the Tappoch, the party proceeded across the fields to visit the ancient castle of Torwoodhead, built by the Baillies, descended from the Baillies of Castlecary, in 1566, as is shown by the figures on a finely carved stone found in one of the field dykes. The castle is a very pleasing example of the kind of house erected by a Scottish laird four or five centuries ago, and would even yet, with a few alterations and improvements, make a most charming residence.—*Scotsman.*

LONDON BUILDING ACT, 1894 :

TRIBUNAL OF APPEAL CASE.

THE Tribunal of Appeal under the London Building Act, 1894, sat at the Surveyors' Institution, Westminster, on Tuesday, to hear an appeal by Mr. A. Cameron Corbett, M.P., under Sections 9 and 19 of the Act, against an order of the London County Council, dated March 25, refusing to sanction the formation or laying out of a street for carriage traffic in continuance of Westmount-road, Eltham Park, Eltham, and in connexion therewith the abandonment of the formation of a portion of Westmount-road, as sanctioned by the Council on October 10, 1899. The members of the Tribunal present were Messrs. J. W. Penfold (Chairman), A. A. Hudson, and E. A. Gruning.

Mr. Cunningham Glen and Mr. Bethune were for the appellants, and Mr. Andrews for the respondents.

The case for the appellants, as outlined by Mr. Glen, showed that Mr. Cameron Corbett is the owner of the fees simple of an estate known as the Eltham Park Estate, Eltham, which estate he is gradually developing for building purposes. Upon such estate is a public carriage road or street, formed and laid out for carriage traffic, known as Westmount-road, and upon land adjoining the estate of which the appellant is the owner is another street, which it was contended had been formed and laid out for carriage traffic. In February last, the appellant, through Mr. Stewart, applied to the London County Council for their sanction to lay out a new street upon the appellant's land, to be 50 ft. wide throughout, and which would directly communicate at its southern end with Westmount-road, and at its northern end with the other unnamed street on the appellant's land. The extension of Westmount-road to the Woolwich-road in the manner proposed by the new street would, it was urged, provide the occupiers of the houses on the Eltham Park Estate with a means of access to Woolwich, where the majority of such occupiers are employed. The grounds of the appeal were—first, that the proposed new street would, at and from the time of its forming and laying out, afford direct communication between two streets formed and laid out for carriage traffic ; secondly, that if the new street would not afford such communication, it was nevertheless unreasonable on the part of the respondents to withhold their sanction to the formation and laying out of the new street.

For the respondent, it was contended that the new street would not afford direct communication between two streets formed and laid out for carriage traffic. Mr. Andrews urged that the unnamed street which the appellant relied upon as forming the connexion was not a public thoroughfare, but a mere right of way.

After hearing evidence and investigating plans, the Tribunal dismissed the appeal, with three guineas costs.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Mr. M'Dougall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Woolwich Borough Council 4,280*l.* for additional plant in connexion with dust destructor ; and 1,090*l.* for street improvement and erection of mortuary ; Battersea Borough Council, 1,460*l.* for sewerage works ; Hammersmith Borough Council, 6,000*l.* for erection of working-class dwellings ; Poplar and Stepney Sick Asylum District Managers, 15,300*l.* for buildings and electric light ; Guardians of St. Olave's Union, 17,280*l.* for works at workhouse ; and Guardians of St. George's Union, 27,700*l.* for various purposes.

Housing : Rye and Sandwich Buildings.—The Housing of the Working Classes Committee reported as follows, the recommendation being agreed to :—

"On July 30, 1901, the Council authorised our chairman (Mr. Waterlow) during the summer recess to accept the lowest satisfactory tender for the erection of a portion of Winchelsea-buildings, Swan-lane site, for the accommodation of persons to be displaced by the construction of the Rotherhithe and Ratcliff tunnel. In pursuance of this authority our chairman accepted the tender of Messrs. Holloway Brothers, amounting to 8,122*l.* (including the comb-graining of internal wood work), and on October 8, 1901, we reported this fact to the Council. Winchelsea-buildings will provide accommodation for 200 persons. The plans of two further blocks of buildings to be erected on the Swan-lane site (Rye and Sandwich Buildings) have now been prepared and have received the approval of the Secretary of State. These buildings will provide accommodation for a further 400 persons in forty tenements of two rooms and forty tenements of three rooms, and the plans are exactly similar to those of Winchelsea-buildings. It is important that the work of erecting these dwellings should be proceeded with as rapidly as possible, so that the accommodation may be available before displacements are actually made in connexion with the tunnel

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works. The architect advised us that it was unlikely that better terms would be obtained for the erection of these buildings than those on which Messrs. Holloway Brothers had undertaken the erection of Winchelsea-buildings. We therefore entered into communication with Messrs. Holloway with a view to ascertaining whether they would be prepared to undertake the erection of the dwellings at the same schedule of prices as that contained in their contract for Winchelsea-buildings. The architect has now submitted to us bills of quantities priced by Messrs. Holloway, and that firm have intimated their willingness to build Rye and Sandwich buildings for a sum of 8,021*l.* for each block, or 16,042*l.* in all, or including the comb-graining of the internal woodwork, 16,184*l.* This is a reduction on the tender for Winchelsea-buildings of 30*l.* for each block of buildings. The architect's estimate of the total cost of the buildings amounts to 16,750*l.*, including 460*l.* for architect's expenses, supervision, quantity surveyor's and other fees and incidentals. We recommend :—(*a*) That the estimate of 16,750*l.*, submitted by the Finance Committee, in respect of the erection of Rye and Sandwich buildings, Swan-lane site, for the accommodation of persons to be displaced by the construction of the Rotherhithe and Ratcliff tunnel, be approved. (*b*) That the offer of Messrs. Holloway Bros. to erect Rye and Sandwich buildings for a sum of 16,184*l.* be accepted. . . ."

It was also agreed, on the recommendation of the Parliamentary Committee, that that Committee be instructed to seek powers in the present session of Parliament to enable the sum of 50,000*l.* to be charged to the cost of carrying out the Westminster improvement, in respect of providing re-housing accommodation on the Millbank estate for persons of the working class displaced in connexion with the improvement.

New Technical Institutes.—The Technical Education Board reported as follows :—

"We are glad to report that the plans for the proposed new institutes at Poplar and Brixton belonging to the Council have at last been completed. The drawings, specification, and bill of quantities for the Brixton building have been referred to the Works Committee. The plans and specification for the Poplar building are now in the hands of the quantity surveyors. The exact scheme of work at each of these institutes is under consideration, but we may say it is contemplated to make the L.C.C. Brixton Technical Institute a centre for practical instruction in the various branches of the building trades, especially in such branches as require more room than can usually be assigned in a polytechnic. The L.C.C Poplar Technical Institute is intended to serve chiefly the needs of a district largely devoted to engineering in its several branches, and to the mercantile marine. We hope that both institutes may begin work in October, 1903."

List of Rates of Wages and Hours of Labour.—The Works Committee reported as follows, the recommendation being agreed to :—

"The Council's list of rates and wages and hours of labour requires revision as regards the rate of pay for overtime for wood-sawyers and wood-working machinists, so as to make it agree with the overtime rates included in the revised working rules for those trades. We recommend that the rate of pay for overtime for wood-sawyers and wood-working machinists in the Council's list of rates of wages and hours of labour be amended as follows :—From 6 p.m. to 10 p.m., time and a-quarter ; after 10 p.m., double time ; Saturdays, noon to 4 p.m., time and a-half ; Saturdays, after 4 p.m., and Sundays, double time."

Means of Escape in Case of Fire from Factories, Workshops, &c.—The Building Act Committee reported that :—

"The Council on December 10, 1901, gave authority for the employment, until the annual revision of salaries, 1902, of three additional surveyors on the unestablished staff in the factory and workshop branch of the Architect's department for the purpose of expediting the progress of the work of seeing that factories and workshops are provided with proper means of escape in case of fire. In view of the approaching termination of the period for which the employment of these three surveyors is authorised we think it desirable to report the progress that has been made in the work on which they are engeged. Shortly after the passing of the Factory and Workshop Act, 1891, a list was received from the Home Office of 1,370 factories which it was thought necessary the Council should inspect, with a view to ascertaining whether any, and if so, what requirements should be made in respect of the provision of means of escape in case of fire. In addition to this number there had been notified up to March 25, 1901, 442 other cases, making a total at that date of 1,818 cases. Of this number, 798 had then been, or were being, dealt with, leaving the very large number of 1,020 cases to be inquired into. Having regard to the serious responsibility devolving upon the Council in this matter, the Building Act Committee in October, 1901, considered what steps could be taken to hasten the completion of the work, and to ensure that the more serious cases should be dealt with as quickly as possible. With this object it was thought desirable to have a preliminary survey made of all cases on the Home Office lists that had not been dealt with, and with the information thus obtained to classify them under three heads, viz. (1) 'dangerous cases ;' (2) 'cases requiring early attention ;' (3) 'cases not immediately urgent.' The services of the three surveyors whose employment was authorised by the Council on December 10, 1901, were therefore utilised for this work, and a beginning was made by dealing with the cases in the City district. Of these all on the original Home Office list, together with a few additional cases subsequently reported, have been inspected, with the result that out of a total of 212 cases sixty have been classed as 'dangerous,' thirty-six as 'requiring early attention,' and seven as 'not immediately urgent.' In 109 cases it was found that the premises did not come within the scope of Section 14 of the Factory and Workshops Act, 1901. Of these, ninety-one cases may be taken off the list of places to be dealt with, but eighteen will require to be watched. There still remain 816 cases to be inspected with a view to classification, 613 of these being cases on the original Home Office list, and 203 being cases outstanding from those subsequently notified to the Council. The time spent on the classification of the 212 cases in the City district has been seven weeks, the inspections having actually commenced on February 18 and finished on April 11, 1902. It is anticipated that a considerably faster rate of progress will be attained as the result of the experience that the officers engaged on the work have acquired, but in order to complete the classification and make good progress with the work of dealing with the urgent cases, we are of opinion that the services of the three temporary surveyors at present engaged on the work should be retained for at least a further period of six months from the revision of salaries, 1902, and we have sent a memorandum to the Establishment Committee to this effect."

Tenders.—It was agreed to accept the tender of Messrs. Mayoh & Haley (1,255*l.* 5s. 6d.) for constructing camp sheeting and a grid at Pageant's Wharf, Rotherhithe.

The tender of Messrs. J. G. White & Co. was accepted, at prices set out in the schedule, for laying stoneware ducts for electric cables in connexion with the reconstruction of the Council tramway between Westminster and Tooting.

It was also agreed to accept the respective tenders of Messrs. Seimens, Bros., & Co. (31,743*l.* 17s. 6d.) and the British Insulated Wire Co. (49,499*l.* 12s. 6d.) for the supply, delivery, and laying of (*a*) the high-tension cables and (*b*) the low-tension cables required in connexion with the reconstruction, for electrical traction, of the Council tramways.

Tramways.—The following recommendation of the Highways Committee was agreed to :—

"That the supplemental estimate for 11,000*l.*, submitted by the Finance Committee, be approved ; and that the expenditure be authorised of that sum, in addition to that of 70,000*l.*, authorised by the Council on February 25, 1902, on the recommendation of the General Purposes Committee, for the acquisition, for the sum of 80,000*l.*, by the Council, as a site for an electricity generating station in connexion with its tramways, of the Gas Light and Coke Co.'s interests in the property known as the Pimlico Gasworks, as offered for sale by auction on February 27, 1902."

Housing, Poplar. — The following recommendation of the Housing of the Working Classes Committee was agreed to :—

"That the tender of Mr. J. O. Richardson, amounting to 13,720*l.*, for the erection of Ottawa and Baffin-buildings, Preston's-road site, Poplar, be accepted ; that the offer of Mr. J. O. Richardson to build the remaining four blocks of buildings on the Preston's-road site at a reduction for all six blocks of 5 per cent. on the prices contained in his tender for the erection of Ottawa and Baffin-buildings be accepted. . . . ."

The Council adjourned at seven o'clock.

A PHOTOGRAPHIC SURVEY OF SURREY.—A provisional Committee has been formed for the purpose of carrying out a photographic survey of the county of Surrey, with the object of taking and preserving permanent photographs of the scenery, geology and natural history, antiquities, buildings, streets, social life, and public events of the Surrey of to-day, as well as the reproduction of old prints, maps, and records of the Surrey of the past. The value and interest of such a record cannot be questioned, especially in the case of Surrey, than which no county is changing more rapidly, and in none, therefore, is the need for such a survey more urgent. A meeting was announced to be held in the lecture-room of the Central Public Library, Town Hall, Croydon (by permission of the Libraries Committee), on Friday, May 9, at 8 p.m., to consider the best means of carrying out this scheme, to which we wish every success.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Whitechapel.—A one-story addition, at the first floor level, at the rear of the Crown and Seven Stars public-house, Royal Mint-street, Whitechapel (Messrs. Shoebridge & Rising for Mrs. A. Vinall).—Consent.

Lines of Frontage and Projections.

Norwood.†—Houses on the northern side of St. Louis-road, Auckland-hill, West Norwood, between St. Bernard's-road and St. Gothard's-road (Mr. R. Pippette).—Consent.

Clapham.—Wood and slate porches at the entrances to six semi-detached houses on the north-west side of Rodenhurst-road, Clapham Park (Messrs. Douglas Young & Co.).—Consent.

Greenwich.—That the application of Messrs. Johnson & Phillips for an extension of the period within which the erection of a one-story addition to the Electric Cable Works, Victoria-road, Charlton, was required to be commenced, be granted.—Agreed.

Greenwich.—A one-story shop on part of the forecourt of No. 491, Woolwich-road (formerly known as No. 1, Anchor-terrace), Greenwich (Mr. E. E. Wood for Mrs. E Mills).—Consent.

Hampstead.—Bay-windows to three houses on the eastern side of Finchley-road and six houses on the north-west side of Platt's-lane, Hampstead (Mr. C. H. B. Quennell for Mr. G. W. Hart)—Consent.

Lewisham.—A house, with a shop on the ground floor, on the east side of Ardgowan-road, Hither-green, Lewisham, to abut upon Dowanhill-road (Mr. A. C. Baker for Mr. J. Horwood).—Consent.

Wandsworth.†—A one-story shop on the south-eastern side of Streatham-hill, Streatham, at the corner of Leigham-court-road (Mr. C. M. Quilter for Messrs. Willoughby & Co).—Consent.

Westminster.†—A stone portico in front of Stafford-mansions, on the east side of Stafford-place, Buckingham-gate (Mr. G. H. Gordon)—Consent.

Battersea.—A temporary one-story addition to the hospital, Prince of Wales-road, Battersea, to abut upon Albert Bridge-road (Mr. A. Parnacott for the Trustees and Board of Management of the National Anti-vivisection Hospital).—Refused.

Lewisham.†—A house, with a shop on the ground floor, on the north side of Sydenham-road, Lewisham, to abut upon Sunnydene-street (Mr. E. W. Evans).—Refused.

Strand.—That the request of Mr. J. E. Chevers for permission to retain for a further period an iron and glass sign at the Savoy Palace public-house, Savoy-street, Strand, extending beyond the general line of buildings in that street be not acceded to.—Agreed.

Strand.†—A steel and glass shelter at the entrance to the buffet and grillroom at the Grand Hotel, Charing-cross, to overhang the footway of the Strand (Mr. W. Woodward for the Gordon Hotels, Ltd.).—Refused.

City.†—An oriel window at the Cripplegate Institute, Golden-lane, to abut upon Brackley-street (Mr. F. S. Hammond for the Governors of the Cripplegate Foundation).—Refused.

Width of Way.

Westminster.—Retention of a portion of a new building erected on the site of No. 7, St. Ann-street, Westminster, upon part of St. Ann-court (Mr. E. Dru Drury for Mr. J. S Burroughes).—Consent.

Greenwich.—Two-story cottages on the north side of Trevithick-street, Watergate-street, Deptford (Mr. D. Young).—Consent.

Rotherhithe.—A building at Bellamy's Wharf, Rotherhithe-street, Rotherhithe (Mr. W. Burrell for the United Kingdom Temperance and General Provident Institution).—Consent.

St. George-in-the-East.—A two-story workshop building, on the site of Nos. 15A, 17, and 19, Great Hermitage-street, Wapping (Mr. J. Parrish for Mr. A. W. Birt).—Consent.

Width of Way and Line of Frontage.

Kensington, South.—A four-story addition at No. 39, Victoria-road, South Kensington, to abut upon St. Alban's-road (Messrs. C. Saunders & Son for Mr. J. C. Eno).—Refused.

Line of Frontage and Construction of Building.

Hackney, Central.—A play-shed in the boys' playground of the Enfield-road Schools, Kingsland, to abut upon Hertford-road (Mr. T. J. Bailey for the School Board for London).—Refused.

Formation of Streets.

Battersea.—An extension of the period within which the roadways of new streets on the north side of Sheepcote-lane, Battersea, were required to be clearly defined throughout by posts and rails, or so otherwise as the Council might permit, and be thrown open to the public as highways, be granted (Mr. W. M. Wilkins, for the Council of the Borough of Battersea).—Consent.

Kensington, South.—That an order be issued to Messrs. Rolfe & Matthews, sanctioning the forma-

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tion or laying out of two new streets for foot traffic only, to lead from Addison-road to Abbotsbury-road, Kensington (for Messrs. Jones Bros.).—Agreed.

Clapham.—A deviation from the plan sanctioned for the formation of three streets on the Springwell Estate, Clapham Common, so far as relates to a diminution in the width of a portion of Meteor-street, near its southern end (Mr. J. Stanbury).—Refused.

Buildings for the Supply of Electricity.

Marylebone, East.—The steelwork of part of an electricity generating station in course of erection on a site on the east side of Grove-road, Marylebone, between the Regent's Canal and Lodge-place (Mr. C. S. Peach for the Central Electric Supply Co., Ltd.).—Consent.

Wandsworth.—A two-story addition to the generating station on the south side of The Causeway, Wandsworth (Mr. C. Thompson for the County of London and Brush Provincial Electric Lighting Co., Ltd.).—Consent.

*** *The recommendations marked † are contrary to the views of the local authorities.*

THE SURVEYORS' INSTITUTION.

A GENERAL meeting of members was held on Monday, the 28th ult., for the purpose of confirming six resolutions duly submitted to, and passed by, a previous general meeting held on Monday, the 14th ult.

In the result the meeting confirmed the Resolutions II., III., IV., V., VI., but decided that the confirmation of Resolution I., relating to the title "Chartered Surveyor," be not submitted to the meeting, and that the question involved in this resolution remain in abeyance until steps had been taken for ascertaining, by means of a circular letter, the views of all the members throughout the country.

The next ordinary general meeting will be held at the Guildhall, Cambridge, on Thursday, May 22, at 10 a.m.

PROFESSIONAL EXAMINATIONS, 1902.

The following Student Candidates have passed the examination for the Professional Associateship :—

L. H. Allen, London; C. E. Amoore, Streatham; §A. W. Ashton, Oswestry; R. H. Barclay, Clapham; J. D. Bastable, Morecambe; C. J. Berry, Wandsworth Common; F. E. Blunt, Liverpool; †B. A Boyton, Old Fulham; R. W. Brealey, Leek; S L. Broad, Woolwich; C. V. Chilwell, London; H. F. Cobb, Higham, Kent; R. H. Coker, London; H. C. Cole, London; J. B. Densham, Purley; C. H. Dinwiddy, London; C. H. Donne, Bury St. Edmunds; F. A. Drake, Woking; C. J. Elgar, Dover; F. Fletcher, London; C. G. French, London; P. F. Gleed, London; H. Hanson, Huddersfield; R. V. Heathcott, Chapel-en-le-Frith; R. C. Holbeche, Birmingham; H. How, London; G. P. Inslev, Bournemouth; R. S. Jackson, Sittingbourne; F. W. Jeffery, Hastings; R. C. Jonas, London; L. N. Knox, London; F. B. Lang, Plymouth; R. B. Lees, Congleton; M. L. Lyon, London; *E. Meacher, Salisbury; C. P. Moss, London; P. W. Mullins, London; J. Murtough, Portsea; F. I. Neame, Faversham; A. D. Orchard, Ashby-de-la-Zouche; H. B. Owen, Newcastle, Staffs; M. H. D. Parsons, Exeter; W. H. M. Pattison, Witham; H. W. Pavitt, London; D. W. Perkin, Tavistock; H. de L. Reany, London; C. C. Reed, Driffield; H. T. Richardson, London; A. H. Rippengal, Croydon; W. S. V. Sansom, Colchester; L. E. Shone, Whitchurch, Salop; C. H. Smith, Calne, Wiltshire; S. A. Smith, Monkseaton; E. C. Steere, Richmond; W. C. Symes, London; V. A. Taylor, Croydon; E. T. Taylor, Lytham; H. G. Tidey, London; S. G. Turner, London; W. A. Walker, Long Ashton; E. J. Ward, London; A. H. Wells, Ashby-de-la-Zouch; F. C. Wheeler, London; A. V. White, Portsmouth; H. W. Witton, Towcester; J. L. Whytehead, Warminster; C. A. Young, London; H. O. Young, Rock Ferry; J. G. Wood, Warlingham.

The following non-student candidates have also passed the Examination for the Professional Associateship :—

G. M. Adams, London; H. C. Amies, Exeter; J. H. J. Appleby, Fareham; W. H. Bamford, London; J. J. Banks, Kendal; H. F. Berry, Southend-on-Sea; C. G. Blore, Canterbury; H. J. Boazman, Penrith; C. V. Boulton, London; H. C. Bradshaw, Eve; F. H. Bramley, Sheffield; C. H. Brown, Walton-on-Thames; J. C. Brown, Kendal; W. H. Brown, London; J. Burnett, Atherstone; W. E. Candy, Wareham; A. B Carr, Bramall Park, near Stockport; A. W. Champernowne, Totnes; J. Chandler, Edenbridge; E. S. D. Cocke, London; P. Crabtree, Mytholmroyd; L. W. David, Llandaff; A. J. Dawkins, London; A. C. Driver, London; E. G. Drower, London; M. C. Duchesne, Slough; S. Fitch, High Wycombe; C. J. Fowler, London; K. G. Gairdner, London; J. J. Gillies, Carlisle; R. H. Goodchild, East Dereham; A. T. Groves, London; F. E. Hale, Salisbury; ‡J. T. C. Hazledine, Shrewsbury; J. L. Heath, Newbury, Berks; F. G. Hennell, London; P. W. Home, London; E. A. Huskinson, Epperstone, Notts; H. H. James, Fen Ditton, Cambridgeshire; A. F. Johnstone, Eastbourne; A. E. Jones, Newcastle, Staffordshire; J. R. Jones, Swansea; R. C. Jull, Tunbridge Wells; J. D. Keele, London; A. J. Lambert, London; R S Lander, London; H. N. S. Langton, B A, London; C. P. Lawrence, Nuneaton; A. P. Lunn, Pontefract; W. V. Lush, Croydon; T. E. Marks, Keighley; G. E. Marshall, Sheffield; H. W. Mason, Barnes; P. T. Maw, Nutfield; P. J. May, Saxmundham; W. F. Merritt, Blackheath; P. Millar, Southampton; H. J. Moody, Folkestone; D. W. Morse, London; J. N. Neill, Leeds; B. Newman, London; C. R. K. Newington, Lewes; S. Parkhouse, London; H. Parkinson, London; A. E. Parry, London; T. G. Pearson, Barrow-in-Furness; G. F. J. Peters, Great Bookham; H. E. Pollock-Hodsole, Hollesley Bay; H. Pritchard, Cardiff; F. W. Randell, Swansea; B. A. Rhodes, Kirkburton, near Huddersfield; H. Richardson, London; G. W. Ruddle, London; W. C. Sainsbury, London; I. Sanders, Southampton; E. Simm, Osbaldistone, near Blackburn; A. J. Slater, Ipswich; W. Smalley, London; A K. Smith, London; A. T. Smith, Bradford; C. P. Smith, London; F. E. Spalding, London; O. F. Stenning, London; J. E. H. Stooke, Hereford; P. J. Symmons, London; E. F. Terry, Ashstead; P. H. Thomas, Lordon; R. W. Thomas, Exeter; L. Tysoe, Richmond; A. C. Vickers, London; E. W. Watt, Hollesley Bay; A. R. Watts, Edenbridge; R. R. Waugh, Hollesley Bay; H. Whitaker, Farnham; A. Whittington-Cooper, London; C. Wilks, London; F. W. Williams, Wallington; F. Willoughby, Merstham; C. Worden, Plymouth; A. E. Wright, Kingston-on-Thames.

Scottish Candidates.

T. Canch, St. Andrews; D. McLean, jun., Golspie, Sutherlandshire; G. W. Orr, Kilmarnock.

The following Professional Associates have passed the Fellowship Examination in Division IV. :—

W. R. Baldwin-Wiseman, Chorlton-cum-Hardy; G. Beken, Jun., London; W. R. Bingham, Richmond; T. S. Bliss, Bicester; H. Bowden, London; H. C. Brierley, Troy, Mon.; F. Brown, London; S. J. Chesterton, London; L. E. Clarke, Falfield, Gloucestershire; R. Cobb, Higham, near Rochester; C. N. Cook, London; G. A. Cooper, London; J. R. Corbett, Manchester; G. E Cragg, Manchester; J. G. M. Davies, Preston; R. H. A. Delves, Dublin; R. A. E Every-Clayton, Hanley Castle, Worcester; A. C. S. Fowler, Chingford; E Fox, Bournemouth; R. F L Freeman, Ramsgate; W. Hider, London; E. R. Hinchsliff, Barry, Glam.; M. P. Holmes, London; H. C. Hood, London; P. R. Hopkins, London; M. Hoskins, Swansea; A. F. Howland, Amersham; J. W. Humphreys-Davies, London; A. R. Kelly, London; W. F. Langridge, Tunbridge Wells; H. Lisney, London; A. W. H. Loveless, London; H. D. Lynes, Corwen, N. Wales; A. W. Martin, London; D. B. Maxwell, Ipswich; S. G. Meacher, Collingham, near Newark; S A. Parnwell, London; J. S. Petch, Leyburn; A. E. Petter, Bristol; F. W. H. Pinsent, London; G. Pinson, Birmingham; G. L. Pottier, Walthamstow; S. L. Sandell, Bromley; J. K. Stephens, Holywood, co. Down; E. R. Stoneham, Erith; A. E. Terry, London; A. F. A. Trehearne, London; F. M. L. Walsh, London; T. J. Walter, Bournemouth; H. P. Ward, Redhill; G. F. Weatherill, Otley; H. S. Webber, Maidenhead; A. S. West, London; ¶‖ M. L. Wheldon, York; G. J. Whitten, Tenby; E. J. Wilson, London; W. B. Wright, London; A. Wyatt, Portchester.

Scottish Candidate.

J. C. Peace, Falkirk.

The following candidates have passed the direct Fellowship Examination in Division V. :—

S. Coope, Farnworth, Lancashire; A. J. Cooper, Curragh Camp, Kildare; J. W. V. Hibbert, London; R. H. Thorp, Hull.

Eight candidates not included in the above list passed the examination in Divisions II. and III. as a whole, but failed in their typical subject.

Sixteen candidates who passed the examination as a whole in Divisions IV. and V., also failed to pass their typical subject.

Eight out of thirty-nine candidates in the various divisions who came up for re-examination in their typical subject have failed again this year.

* Institution Prize. † Special Prize. § Beadel Prize.

‡ Driver Prize and Penfold Silver Medal.

¶ Penfold Gold Medal. ‖ Crawter Prize.

TRADE CATALOGUES.

MESSRS. G. & T. EARLE, of Hull, send us a pamphlet describing the standard methods of testing cement adopted in the testing-rooms in connexion with their works. After details of the tests adopted, we find a few pages setting forth the various pitfalls besetting the path of the inexperienced investigator. A good deal of useful and interesting information is given in the book, which is quite worthy of a permanent place on the bookshelf of the architect's office.

Messrs. Adams & Co. send us their 1901 catalogue of sanitary fittings, &c. It is well printed, and contains upwards of a hundred excellent illustrations (reproduced from photographs) of baths, lavatories, sinks, single and multiple water-closets, urinals, flush-tanks, disconnecting and intercepting traps, and other sanitary apparatus. A word of praise must be given to this firm for the artistic character of the designs for lavatories, closets and other fittings. Printed ornament is conspicuous by its absence. The pottery is plain glazed, but a certain amount of distinction is obtained by graceful outlines and by simple broadly-designed conventional patterns in very low relief. Among the novelties we notice some divisions for closet-compartments; these have cast-iron pillars, grooved to receive marble, slate or "opaline" slabs, and are supplied with or without dwarf wood doors. Water-closets form an important part of the catalogue, and include single closets and latrines of various kinds; wash-out and valve closets, are not shown, and this elimination of obsolete and obsolescent apparatus is a commendable feature. The "Insular" enclosed tip-up lavatory deserves mention; it is made entirely of glazed "titanite," and is in shape very similar to a pedestal water-closet; other lavatories have standing wastes and overflows placed in recesses at the back of the basins, so that every part can be easily cleaned. We cannot notice all the interesting fittings illustrated, but may say that nearly all bear evidence of careful thought and intelligent design. The catalogue is one to keep and use.

We have received from Messrs. John Bolding & Sons their apparently-new but undated catalogue of sanitary fittings, drainage apparatus, and plumbers' goods. Valve-closets occupy the place of honour, and are followed by siphonic and wash-down closets of various kinds, some having lead traps. A good assortment of closet-cisterns is shown. Among the lavatories are some interesting examples, such as the independent hexagonal marble lavatory with six basins, but the illustrations scarcely do justice to the fittings; all the overflows appear to be of the secret standing-waste type, or the ordinary porcelain grate. The woodwork of some of the cabinet lavatories is fussy and inappropriate, and the cast-iron standard lavatories with mirrors are extremely ugly. A special feature is made of copper baths for houses and hospitals, but there is nothing particularly novel. Among the other contents are sinks for houses and hospitals, slop-sinks, "urinettes" for women's use in public conveniences, water taps, steam fittings, pumps, lead traps, dustbins and shoots, and rainwater goods. The drainage section contains some good grease traps of the flushing-rim type, and a valuable series of illustrations on cast-iron drainage. The manhole-channels and many of the stoneware and iron gullies are also well adapted for their purpose. The catalogue is of the ordinary trade kind, but will prove useful as a work of reference for architects and plumbers. It is furnished with a complete index, and is well printed.

A catalogue of a much more heterogeneous character is that of Messrs. O Brien, Thomas, & Co. It is divided into three parts. The first part (containing 492 pages) includes stoves, fire-grates, mantels, and cooking ranges; the second (272 pages) deals with "sanitary goods," "rain-water goods," stable fittings, railings, and gates, and "builders' sundries": and the third (280 pages) comprises ironmongery, brass foundry, bells, workmen's tools, paints, varnishes, &c. In all these pages it would be strange if something of interest could not be found. Among the mantel-registers and chimney-pieces are some good designs, but they are almost lost in the crowd of bad and indifferent specimens. How is it that ironfounders are content with such a low standard of design? Their one desire appears to be to cover every square inch with ornament, however debased or meaningless it may be. It is only fair to say, however,

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that in many cases the illustrations in this catalogue are more like caricatures than true representations. The sanitary fittings are, almost without exception, of commonplace character. In the section on builders' ironmongery no fewer than twenty-three pages are devoted to descriptions and illustrations of the "Coburn" patent door-hangers—a meritorious American invention for sliding-doors and partitions. Space would fail us to mention even a tithe of the articles illustrated in this catalogue. Suffice it to say that there are few fittings required in a building of which some examples cannot be found within its covers, but it is a trade catalogue of ordinary type, suitable perhaps for the firm's purpose, but entirely lacking in distinction.

Messrs. Mark Fawcett & Co. send us a handsomely got-up pamphlet containing photographic views of buildings in the United States, most of them of a high-class and by good architects, in which the Fawcett fireproof floor has been used. It forms a testimony to the favour which this floor, made by an English firm, is finding in America.

The Woolpit Brick Company (Woolpit, Suffolk) send an illustrated catalogue of their red and white moulded and ornamental bricks. The ornamental designs are not quite what would satisfy architects, though some of them may work in effectively as diapers. The moulded bricks show good and effective mouldings in considerable variety.

The Medmenham Pottery send us a pamphlet containing a description and illustrations of their decorative work in pottery and tiles, which is carried out under the direction of Mr. Conrad Dressler, whose name is in itself a guarantee that this is a pottery for carrying out really artistic work. The following quotation from their pamphlet may best explain their system and the objects they keep in view :—

"The Medmenham Pottery was founded with the object of producing architectura pottery and tiles possessing individuality in design and execution. We have felt that, in order to reach this aim, we must place ourselves in conditions approximating those of the old potteries whose ware delighted and inspired us. We therefore established our pottery right away in the country. We use our Marlow materials as much as possible and employ village workpeople. These elements are allowed to influence our work to the fullest possible extent.

Our tiles are made in two ways, either in plastic clay, entirely by hand, or pressed in a more mechanical fashion. In both cases, however, the same patterns and the same methods of colouring by hand are used. The plastic tile, although having more the effect of old work, is not so suitable to modern conditions, which demand greater correctness of form and exactness of size. Architects can have which they like."

The tiles being all made in multiples of the square inch, there is no difficulty in making up various designs from the separate elements. The designs shown in the catalogue are all of good and artistic character. Architects' own designs can be carried out at a slightly increased rate. The Potteries are situated about a mile and a half from Marlow, and the proprietors invite the visits of architects and others who may be in the neighbourhood.

Messrs. James Smith & Co., Timber Merchants, send a small pamphlet, useful chiefly to contractors, of their present stock of deals, battens, floorings, &c.

Messrs. A. J. Arrowsmith & Co. send us an illustrated catalogue of their moulded and carved wood chimneypieces, together with illustrations of other more elaborate work which they have carried out for various architects. We are glad to be able to give unqualified praise to this catalogue. The designs for chimneypieces are all in good taste and appear to be very well executed; the illustrations are also exceedingly artistic in style. It is not often that we receive a catalogue of artistic furniture which is so satisfactory as this.

Messrs. Hughes & Stirling, of London and Liverpool, send us a pamphlet describing the "Stirling" refuse destructor, built under the patents of Mr. Liversedge, A.M.I.C.E. This particular type of destructor is a compound furnace having at least two cells, each with a drying hearth, while between the two is a supplementary chamber where combustion is completed and dust is deposited. An illustration in the pamphlet shows the new installation at Aston Manor, where the refuse is carried by a transporter to an overhead storage and charging shoot. This method of handling the material is largely automatic, and seems to be simple and cleanly.

Messrs. Mather & Platt, of Salford, sends us an illustrated prospectus of the Mather-Reynolds high-lift centrifugal pump, now in extensive use for mine, well, dock, fire, and irrigation purposes. The essential feature of this pump is that it consists of one or more sets of vanes, each in its own chamber. So the delivery pressure of the liquid varies directly as the number of chambers used. While the lift of an ordinary centrifugal pump does not exceed, say, 50 ft., the most recent form of this special type is capable of delivering water against a head of 200 ft. with a single chamber.

Messrs. Wallach Bros., of London, send us a price list of safety and labour-saving appliances, amongst which we notice a handy-looking whitewashing machine, also available for fire-extinguishing purposes in case of need. Steps for overhead shafting, with various safety devices, are also illustrated, these being appliances of a kind that might always be included in specifications relating to the mechanical equipment of hospital, laundries, and other places where shafting is used.

Messrs. Jacobs Brothers & Co. (London and Antwerp) send us their price-list of metals, window-glass, iron and steel rolled rods, rolled steel joists, steel wire, &c.

BOOKS RECEIVED.

THE DESIGN OF STRUCTURES. A Practical Treatise. By S. Anglin, C.E. Third edition. (Charles Griffin & Co.)

ANTIQUE WORKS OF ART FROM BENIN. Collected by Lieut.-General Pitt-Rivers. (Printed privately.)

Correspondence.

THE "LIGHT" QUESTION.

SIR,—In recent years probably no question has caused more annoyance, trouble, and expense to architects and their clients than that of "light." Building after building is brought to a standstill, and case after case comes into the law courts, without apparently any definite or precise rules being laid down. This is doubtless to the benefit of the legal profession, but much against the interests of the architectural profession, and as a matter of justice to the public certain rules ought to be laid down, which would at least minimise the evil. Special cases, of course, there must always be, which possibly no written rules could or would cover, but many of the ordinary cases cropping up might absolutely be avoided if certain definite and common-sense rules were made, and recognised as binding.

For instance, there should be no great difficulty in laying down a fixed law that if a street is a certain width the owners on both sides are entitled to build up to a certain height proportionate to the width of the street, without let or hindrance. If this was recognised in law, every owner of land or old buildings in such a street would know precisely how high he was absolutely entitled to build without let or hindrance. If the width of the street allowed for a legal height of, say, 40 ft., no action could then be brought against any owner building up to this height, even if a pre-existing building had only been 15 ft. high, or the ground had previously been unbuilt upon. A definite law of this sort would at least save a lot of litigation which now takes place, and which ought not to be possible. Of course, it would not prevent a building being taken higher, when the right already exists, nor would it really limit the height of any other building; but it would at least be a starting point from which no exception could be taken by an opposite owner, and many disputes which are now possible would be rendered impossible.

In other words, such a law would be a step in the right direction, and might lead to other certain definements, and at least minimise the present uncertain condition of affairs. The great difficulty in getting a matter like this settled lies in the taking of the initiative. In Parliament there are few architects, but many lawyers, and the latter would, of course, have no interest in taking up the subject; but there are many architectural societies in England, and if they could be persuaded to take the matter up seriously and work it through, practical proof would be given that they are of some use both to the profession and to the public.

COMMON SENSE.

MEMORIAL TO THE LATE MR. JAMES BROOKS.—On the 2nd inst. three iron screens between the arches leading into the Lady Chapel, St. Faith's, Stoke Newington, were dedicated. These have been put up as a memorial to the late James Brooks, who was many years churchwarden of the church. They were designed by his son, Mr. J. Martin Brooks, Wellington-street, Strand.

The Student's Column.

PART II.—DRAINAGE.

CHAPTER 17.—SOME EXAMPLES OF DRAINAGE SCHEMES.

THERE is no stock pattern for drainage schemes. Buildings differ in size, arrangement, and purpose, and in their relative levels and positions with regard to the sewers, and the drains must also differ. A few typical examples may, however, be of service. It is impossible in the space at our disposal to give drawings to a large scale, but the illustrations will, it is hoped, show the general lines on which drains may be planned. As a rule, an architect is compelled to consider economy, but it is certainly an error of judgment to scamp the drains for the sake of a little pretentious ornament above ground. Drains ought always to be designed and constructed so as to be reasonably efficient, although, of course, the design and construction cannot in every case be of the best. The drains from farm buildings, for example, need not be so costly as those of a mansion. But economy ought not to be pushed beyond a certain limit. Building owners are gradually learning that a little additional money spent on drains is not only a good investment from a sanitary point of view, but is also cheaper in the end. The omission of manholes in a drainage system reduces the initial cost, but the first stoppage of the drain may entail an expenditure in excess of the original saving, and much annoyance besides.

Economy must be carefully studied in workmen's cottages. Two plans may be adopted. In the one, the drains of each house are distinct from those of the other houses, and have separate connexions with the sewer. In the other, a "combined" main drain receives the branches from a number of houses. The law relating to combined drains of this kind has already been stated, and Local Authorities are now alive to the fact that in certain cases such combined drains are technically "sewers," for the repair of which the authorities are liable. Provincial Authorities, which have not adopted Part III. of the P.H.A. Amendment Act, 1890, sometimes, therefore, refuse, in self-defence, to pass plans showing combined drains. The writer has had considerable difficulty in some cases in getting such plans approved.

If the separate system is adopted each house-drain ought to be intercepted from the sewer by means of an intercepting trap, above which a pipe-shaft must be carried up and finished with an air-inlet grate at or above the surface of the ground. Unless there is an internal water-closet, the drain does not as a rule require any other ventilation. Where an internal water-closet is provided, the soil-pipe must be utilised as a ventilating shaft. The drains in this class of property are usually so short that more than one opening for air is unnecessary. Fig 80 shows this arrangement, W being the trapped sink-gully, W.C. the water-closet, and I.T. the intercepting trap and air-shaft; some authorities allow the trap to be placed under the footpath of the back street as shown, while others require it to be in the back yard of the house. The rainwater-pipes discharge over the sink gullies.

In fig. 81, a combined scheme of drainage for a row of cottages is shown; WW are the trapped sink gullies; W.C., W.C. the water-closets; I.C. the ventilated intercepting chamber and trap; M. an inspection-chamber at the head of the combined drain, fitted with an airtight cover; and V.P. a ventilating pipe carried up the wall of the house and terminated by a copper wire guard above the eaves or ridge. This arrangement is somewhat more costly than the other for a small number of houses, but it is more easily cleansed and more thoroughly ventilated. The intercepting chamber is placed under the footpath of the street, this position having been adopted by the writer in many cases and approved by the authorities. In some districts it must be placed in the back yard of the lowest house, and if this position is adopted it is better that the branch drain from the water-closet of that house should open directly into the chamber, and not be connected to the main drain.

In houses of this class the only drain inlets on the front of the building are, as a rule, from rainwater pipes. It is generally considered sufficient to disconnect these by means of suitable gully-traps, and to run the drains to the sewer without interception. A combined

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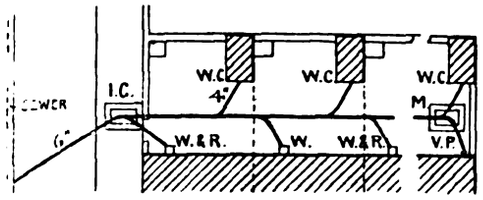

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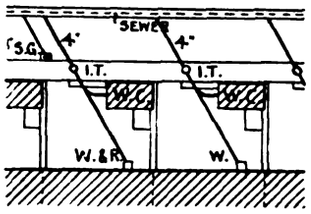

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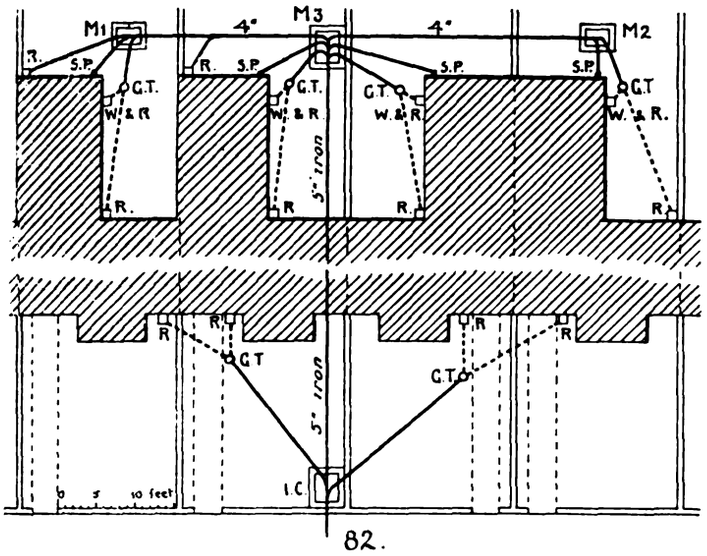

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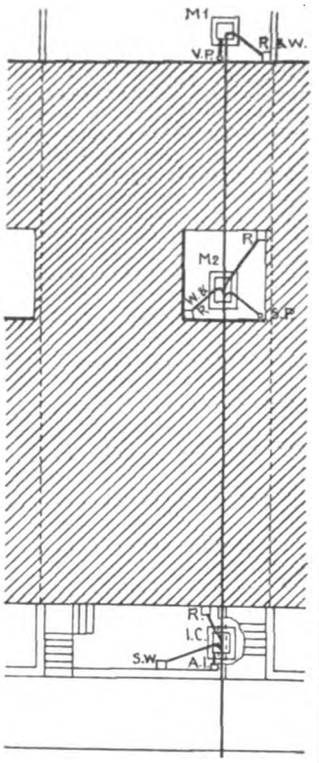

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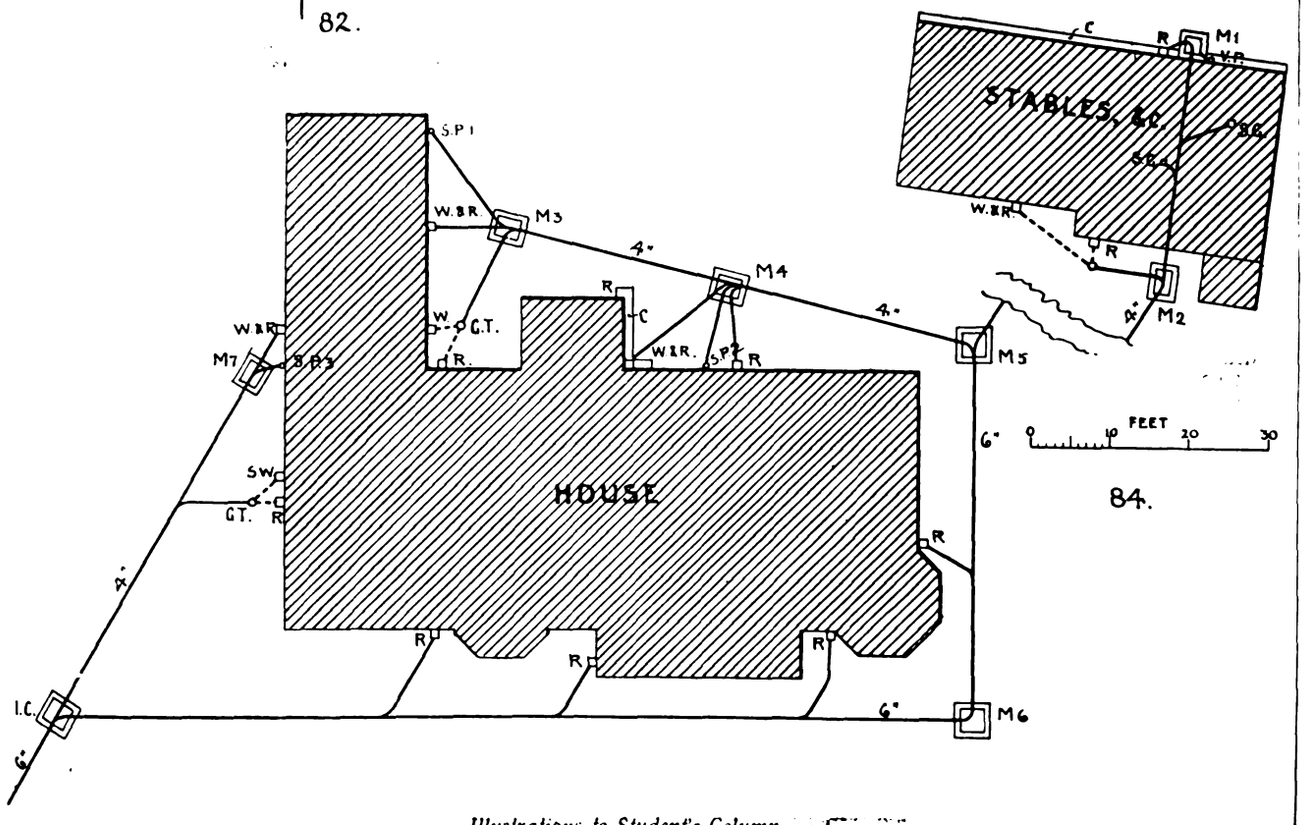

84.

Illustrations to Student's Column.

drain is often more economical, an intercepting trap and air-shaft being fixed in it before its connexion with the sewer. Where the separate system of sewerage is adopted the rainwater drains from the front of the building must be connected to the surface-water sewer; those from the back are often, though not invariably, permitted to enter the sewage conduits.

In the case of a group of houses in the middle of a long row, without back street or passage, a single combined drain may be laid under one of the houses from back to front. This will be more economical and more generally satisfactory than a separate drain for each house. The pipes under the building must be of cast-iron, and an inspection-chamber must be provided at each end. No connexion must be made with this pipe under the building, and none if possible between the two chambers. A typical arrangement is shown in fig. 82. The drains from rainwater-pipes and waste-pipes are, where possible, carried to gully-traps (G.T.) ventilated on the inlet side; the drains above these traps are shown by thick dotted lines, and have untrapped "shoes" at the inlets, so that there is an uninterrupted current of air along each drain. The sink on the ground floor and the bath and lavatory on the first floor are served by the same waste-water shoe (W) in each case. Manholes 1 and 2 (M1 and M2) are junction-chambers with airtight covers, and are ventilated by the soil-pipes (S.P.) of the two end houses. Lampholes with airtight covers may be fixed at these points to reduce the cost, but are not as satisfactory. Manhole 3 (M3) is essential, and, like manholes 1 and 2, must have an airtight cover; it is ventilated by the soil-pipes of the two middle houses. The intercepting chamber (I.C.) must be ventilated by means of a perforated cover, or by a pipe-shaft and grating fixed to the garden wall; an intercepting trap with airtight cleaning arm must be fixed at the outlet of the chamber to intercept the drains from the sewer. The drain between manhole 3 and the intercepting chamber must be of cast-iron, and may with advantage be entirely surrounded with concrete; the diameter of this and the other drains must be in accordance with local by-laws, but a 5-in. main and 4-in. branches are large enough for all the sewage and rainwater arising from these premises.

The arrangement shown in fig. 82 is not the only one which may be adopted. The drain from M1 may be intercepted from M3 by means of a ventilated trap near the latter, so that this section of the drains is intercepted and separately ventilated. Similarly the three drains

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entering M3 from the right may be collected to a small junction chamber, and there intercepted. Such duplication of traps, however advantageous it may be in preventing air from entering the branch drains from the main, is unnecessary in a small system of this kind. It must not be forgotten that nearly all stoppages of drains occur at traps, and the aim of the architect ought to be to reduce the number of these fittings as much as can safely be done.

A system of drainage for a single house in the middle of a row is shown in fig. 83. In this house the water-closets are arranged above each other, and one soil-pipe (S.P.) serves for them and the slop-sink. The water-closets adjoin a central area. The London County Council by-laws specify that at least one wall of a new internal water-closet must be an external wall, and must "abut immediately upon the street, or upon a yard or garden or open space of *not less than 100 square feet of superficial area*, measured horizontally at a point below the level of the floor of such closet." The area in the illustration fulfils this condition. An external water-closet "below the surface of the ground and approached directly from an area or other open space available for purposes of ventilation" will be approved if the open space contains at least 40 superficial feet, and is not less than 5 ft. wide, and not covered otherwise than by a grating or railing. The manhole (M1) at the head of the drain receives the branch from the trapped gully (R. and W.), to which the waste water from the scullery sinks and dressing-room lavatory, and the rainwater from the main roof are led. This gully may be a grease-gully, automatically flushed from a tank, which may with advantage be fixed in the scullery to prevent the freezing of the water. The manhole has an air-tight cover, and a ventilating pipe (V.P.) is carried up the wall of the building to a suitable point above the eaves or ridge. As an alternative arrangement, the drain from M_1 to M_2 may be intercepted near the latter, an opening for air being provided at each end; the air from the lower part of the drainage system will thus be prevented from passing along the upper drain. The waste-water gully (W. and R.) in the area receives the discharges from three pipes, (1) wastepipe of butler's sink, (2) main external wastepipe from lavatories and baths, and (3) rainwater pipe. The drains from these and from the rainwater gully (R) are taken to the manhole or junction chamber (M2), which is provided with an airtight cover. The intercepting chamber (I.C.) is constructed in the front area, and has an airtight cover and an airpipe (A.P) fixed to the front wall of the area and finished with a grating about a foot above the ground. Surface-water is collected by the trapped gully (S.W.). The drains from M1 to I.C. ought in any case to be of cast-iron, and the same material may with advantage be used for the branch drains.

The country-house and stables shown in fig. 84 have two sets of drains, those from the carriage drive, &c (not shown in the illustration) being taken to old field-drains. The drainage has been carried out at two different times, on account of additions having been made to the house, and the drawing does not in every detail represent the work as executed. The servants' water-closet is on the ground floor at S. P. 1. The second soil-pipe (S. P. 2) serves water-closets on the ground and first floors. The third soil-pipe (S. P. 3) is from the slop-sink inserted during the recent additions, and the waste water-gully near this (W. & R.) receives the waste pipe from the new servants' bath and lavatory, as well as a rainwater-pipe. S. W. is a surface-water gully at the bottom of a small area. The channel C alongside the small projection at the back of the house conveys rainwater from the pipe at R to the gully at W, which receives the wastes from a butler's sink and lavatory on the ground floor and a bath and lavatory on the first floor. The drains at the back of the house might have been intercepted from the main by means of an intercepting trap placed in M4 or in a small chamber to the left of M5.

The stable-drain from M2 to M5 is in a straight line. The main stable-drain runs under the floor from M1 to M2, the branch-drains being connected by means of pipe-junctions. The head of the drain receives the rainwater from the back of the roof, and surface-water from the channel C; these waters serve to flush the drain. A ventilating-pipe (V.P.) is shown to be carried up the wall from M1 in order to ventilate this branch of the drainage system. A word about stable-gullies may not be out of place in this connexion. Many of the gullies supplied even by well-known makers of stable-fittings are far from satisfactory. Some have merely an oblong opening in the side, and it is therefore impossible to make a watertight joint between the gully and the drain. Others have a projecting outlet, rectangular in cross section, designed for fitting into a hole of similar shape cut in the side of the drain-pipe; this joint also is difficult to make watertight, and deposits are almost certain to occur, as the sewage enters the drain at right angles to the flow. Many gullies are of the dip type with square corners, and cannot possibly be kept clean. A stable gully ought to have the same general shape as an ordinary gully-trap, the outlet being circular; it may have a perforated receptacle to retain litter, or may be fitted with an upper and lower grating, the latter being above the standing water and having small openings, so that large pieces of litter will be retained.

The intercepting chamber (I.C., fig. 84) has a perforated cover; the other manholes have air-tight covers. The branch drains from the rain-water pipes on the front and end of the house are connected to pipe-junctions in the main drain, junction-chambers not being necessary for such drains.

OBITUARY.

MR. T. P. LILLY.—The death has just occurred at Plank House, Gillingham, Dorset, of Mr. Thomas Parkes Lilly, at the age of seventy-six years. The deceased came to Gillingham in 1857, and, as the agent of Brassey & Co., was responsible for the construction of the Salisbury to Yeovil branch of the London and South-Western Railway. Apart from this particular work, he had considerable experience in railway construction in Belgium and elsewhere. He devised the water-supply scheme at Rolls Bridge, which has proved quite a boon to residents in the Wyke district. He owned the stone quarries at Chilmark, having works at Tisbury station.—*Salisbury and Winchester Journal.*

GENERAL BUILDING NEWS.

ST. CATHERINE'S CHURCH, HORWICH.—The new church is situated on a site near Chorley New-road, and the portion completed consists of nave, side aisles, vestries, and temporary chancel, leaving transepts, side chapel, chancel, and east end to be added at some future time. The present part provides about 600 sittings, which number will be largely increased when the church is completed. In the basement, a large parish room is provided, also lavatories, &c. Externally the building is built of local brick, with red Ruabon terra-cotta dressings, and North Country green slates with red ridge. The windows are filled with lead glazing of ornamental design, and the clearstory walls are finished with rough cast, the lower walls being faced with pressed brick with internal dressings of red Rainhill stone. The inside woodwork is of pitch pine, left unvarnished, the inner boarded ceilings, which will be waggon-shaped, being left to be carried out at some future time. The floors of passages to aisles are of red Ruabon tiles, and the main entrances are at the west end, internal screens of pitchpine filled with lead glazing being provided to each. It is proposed to seat with chairs for the present, and the lighting is by ornamental pendants hung from the nave arcading, and incandescent light is to be used. The heating is by hot water on the low-pressure system, and has been carried out by Mr. John Crook, of Bolton. The temporary chancel is of the required size, and is separated from the nave by temporary chancel arches, the two side bays of which are filled in with low pitchpine screens of suitable design. The contractors for the whole of the works are Messrs. Moore Bros., of Rawtenstall, their sub-contractors being Mr. T. C. Cowpe, of Rawtenstall, plastering and painting; Mr. Wm. Shaw, Farnworth, slating; Mr. Wm. Witter, Bolton, plumbing; and Messrs. Walmsley & Co., Preston, lead glazing. The work has been carried out from the designs and under the superintendence of Mr. R. Knill Freeman, of Bolton and Manchester.

RESTORATION OF FELTON CHURCH, NORTHUMBERLAND.—On the 25th ult., the ancient parish church of Felton was reopened after restoration. The restoration of the church has been carried out under the direction of Mr. W. S. Hicks, Diocesan Surveyor. A structure which was erected sixty years ago has been removed, and a new wall built on the old foundation. Three new tracery windows have been inserted, and a new vestry has been built, the old vestry having been converted into an organ chamber, with a view to having a larger organ in future. A new leaden roof has been fixed throughout, and there have been alterations and improvements in the chancel; and the improvements include a new boiler, a heating apparatus, incandescent lights, a new lectern and credence table, font-ewer, and other church furniture. The cost of the renovation has been over 1,000*l.*

CHURCH, WALWORTH.—The new church which it is proposed to erect at Walworth will be a thanksgiving church for conversions in this country, and will be called the Church of the English Martyrs. The architect is Mr. Francis Tasker. Messrs. N. Gough & Co., of Hendon, are the builders.

ST. JAMES'S UNITED FREE CHURCH, KILMALCOLM, RENFREW.—The new St. James's United Free Church, Kilmalcolm, will, at the outset, seat a congregation of over 600, while a gallery can be added to accommodate some 200 more. The church has been designed by Mr. William Leiper, R.S.A., and is estimated to cost 10,000*l.*

UNITED METHODIST FREE CHURCH, LEIGH-ROAD, WESTCLIFF-ON-SEA.—The opening of this church took place recently. The church is designed in Late Perpendicular Gothic, freely treated, and is faced with red bricks externally, the dressing and tracery being of white Costessey work. The roof is covered with green slates. The main gable is flanked on the one side by a dwarf octagonal turret and on the other by a square tower, the latter terminating in a spirelet. The church is designed for future deep double transepts, but these are at present only erected to a depth of a few feet. School and class rooms are provided for in the future. The present portion has been erected by Messrs. Battley, Sons, & Holness, Old Kent-road, S.E., the contract amount being 2,124*l.* The architects, whose designs were accepted in competition, are Messrs. George Baines and R. Palmer Baines, Clement's Inn, W.C.

CHAPEL FOR CARNKIE BIBLE CHRISTIANS, CORNWALL.—A new Bible Christian Methodist Chapel was opened recently at Carnkie, a village midway between Helston and Falmouth. Internally the chapel measures 43 ft. by 32 ft. 6 in., and it has an orchestra with provision for a large choir and an organ. A vestry for the minister is arranged on one side of the orchestra, and on the opposite side there is one for the choir. The building was designed by Mr. Sampson Hill, architect, Redruth.

WESLEYAN METHODIST CHURCH, THORNTON, LEICESTERSHIRE.—The new Wesleyan Methodist church and schools at Thornton were opened recently. The church is planned to seat 250 adults, and has an organ and choir gallery behind the rostrum. A schoolroom with a vestry and class-room, and kitchen and other accommodation, adjoins in the rear. The style is late Gothic, and the walls are of Ellistown red bricks with dressings of Derbyshire stone. The principal features in the front are a five-light stone traceried window, and a turret, with lead-covered spire. The total cost of the building, exclusive of the site, will be about 2,000*l.* Messrs. Tait & Herbert were the architects.

BOARD SCHOOLS, SALFORD.—Memorial-stones were laid on the 24th ult. of two of the schools which the Salford School Board are erecting in the borough, one in Tootal-road, Weaste, and the other off Regent-road, in West Peel-street. The school at Tootal-road is arranged in three departments, the accommodation being for 395 infants, 440 boys, and 440 girls. Each department is provided with a central hall, with seven classrooms leading out of it. There is also provision for the teaching of cookery, laundry-work, and manual instruction. The total cost of the buildings will be 15,738*l.* The design, which has been prepared by Mr. H. E. Stelfox, of Manchester, is English Renaissance in style. The second school is being erected to replace two existing buildings which did not meet the requirements of the Board of Education. The school will consist of two departments, one "mixed" for 450 children and the other for 327 infants. The plans of the school have been prepared by Mr. J. B. Broadbent, and the total cost is estimated at 8,747*l.*

NEW EMPIRE THEATRE OF VARIETIES, NEWCASTLE-ON-TYNE.—The foundation-stone of the new Empire Theatre of Varieties (which is to be erected in Newgate-street, Newcastle, taking in the whole of the existing site and a considerable area adjoining) has just been laid. The architect of the new building is Mr. Frank Matcham, of London. The present Empire, including the Scotch Arms Hotel, and the property to the right and left, which has been acquired, will be pulled down. A portion of the stone front will remain, but to this will be added a large building carried above the existing frontage and terminating in towers. It is proposed to erect a glass shelter along the whole of the front, and the side road will be similarly protected for patrons of the pit and gallery. All the available area is to be occupied by the new buildings. The ground floor or pit, instead of being approached by a staircase as at present, will be slightly lowered below the street level. The principal entrance to the new theatre will be from Newgate street. The new theatre will be heated by means of steam and lighted by electricity. The stage will be 60 ft. wide and 50 ft. deep.

ALTERATIONS TO THE PRINCE'S THEATRE, BRISTOL.—Extensive alterations and improvements are now in progress at the Prince's Theatre, Bristol. The alterations have been planned by Mr. Frank Matcham, of London.

PROPOSED CENTRAL FIRE BRIGADE STATION, DUBLIN.—On the 22nd ult. Mr. Cowan, Chief Engineering Inspector of the Local Government Board, held an inquiry at the City Hall with reference to an application made by the Dublin Corporation to the Local Government Board to sanction

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two loans, one of 25,000*l.* for the erection of a Central Fire Brigade Station at the corner of Tara-street and Great Brunswick-street, the second loan applied for being one of 10,000*l.* to enable the Corporation to make advances under the Small Dwellings Acquisition Act of 1899. Mr. C. J. McCarthy, City Architect, gave evidence as to the plans of the proposed central station.

BATHS, HECKMONDWIKE. — New baths were opened at Heckmondwike on the 26th ult. The baths are a section of a suite of buildings which also embrace an electric lighting plant and fire station. The former comprise a manager's house and office, laundry, four first-class slipper and a similar number of vapour and douch baths, eight second-class baths of each variety, and fifty-eight "rain baths"; a plunge bath for adults, 75 ft. by 30 ft., another small one for children, together with Turkish baths, and the necessary cooling and shampooing rooms. The steam required for the baths is supplied from the electric lighting station. The premises have been erected from designs prepared by Mr. J. Saville, Surveyor to the Council, under whose superintendence the works have been carried out.

MUSEUM, CARDIFF.—A series of plans for the new museum in the Cathays Park, Cardiff, was approved for recommendation to the Corporation by the Museum Committee on the 25th ult. Mr. E. Seward, who prepared the plans, said he would keep in view the necessity for harmony with other buildings in the park.

ISOLATION HOSPITAL, BEDFORD.—The new infectious diseases isolation hospital for the Bedford Rural District Council is situated on the lower slope of Oakley or Milton Hill, a short distance beyond Clapham and off the road leading thence to Milton Ernest. Mr. H. Young has been the architect; and the tender of Mr. T. H. Coleman, builder, was accepted for the work. The contract price was 7,143*l.*

NEW SCHOOLS, MARPLE.—New schools are now in course of erection in connexion with All Saints' Church, Marple. The foundation-stone was laid on Saturday, the 3rd inst. The accommodation is for 300 children, the cost being about 7*l.* per child, exclusive of the land and furnishing. Messrs. Robinson & Sons, of Hyde, are the contractors; the architects being Messrs. J. Hunt & Son, of Stockport.

SANITARY AND ENGINEERING NEWS.

RESERVOIR, LANCASTER.—The Lancaster Corporation have just completed the waterworks undertaking, which was begun in 1854, by the opening of the Blea Tarn storage reservoir. The new reservoir has a holding capacity of 120,000,000 gallons, and is now full. It has been constructed under the superintendence of Mr. John Cook, Borough Surveyor and water engineer to the Corporation, Mr. James Mansergh, C.E., the original engineer for the Lancaster Waterworks, being consulting engineer for the present extension. The estimated cost was 61,000*l.*, but the reservoir has been constructed for about 9,000*l.* less than the estimate, and the holding capacity has been increased by 20,000,000 gallons beyond what was originally intended.

SANITARY WORKS AT BUCKINGHAM PALACE.—The drainage and other sanitary arrangements which were carried out at Buckingham Palace by the officials of His Majesty's Office of Works a few years ago have been thoroughly inspected and tested by Professor Corfield, M.D., the Consulting Sanitary Adviser to H.M. Office of Works, who has reported "that the drainage arrangements have been very well planned and carried out, and reflect credit on all concerned with them." He has, however, suggested a number of improvements in the sanitary arrangements generally, the most important of which have been already carried out under his supervision and to his satisfaction. The remainder, which consist chiefly of certain rearrangements, will be carried out in the autumn.

FOREIGN.

FRANCE.—An exhibition of decorative art, ancient and modern, is shortly to be opened in the Pavillon Marsan at the Louvre.——The Municipality of Corbeil has opened a competition for the rebuilding of the Hôtel de Ville.——The Fine Arts Department has commissioned M. Yperman, a painter attached to the Commission des Monuments Historiques, to make a careful restored copy of the fresco by Simone Memmi on the gable of Nôtre Dame des Doms at Avignon.——The Corporation of Nantes have voted a sum of 1,340,000 fr. for the carrying out of various architectural works, including the building of a school of drawing for the town and district.——The Municipality of Lyons have decided on the creation of a new public place, ornamented with trees, at the junction of the Avenue de Saxe with the Avenue des Ponts.——Works for the extension of the port are shortly to be commenced at Nice.——Some fine ancient mosaics have been discovered during some excavations in the neighbourhood of Arles. One of them, about 10 ft. long, represents the carrying off of Europa. The Archæological Society of Provence is directing the excavations.——The jury in the competition opened at Lilas for the laying out of a public square there has awarded the first premium to M. Bevière, the second to M. Durand, and the third to M. Chesnay.——An international exhibition of art is to be held at Lille from the end of the present month to September.——The death is announced, at the age of ninety-two, of Laurent Grandfils, a sculptor who obtained some reputation in the exhibitions under the Second Empire. He had been, for forty years, Professor of Sculpture at the Académie of Valenciennes, and among his pupils there were Crauk, Hiolle, Carpeaux, and other well-known artists. —— M. Félix Vionnois, formerly Architect to the Department of the Cote d'Or, has died at the age of sixty-one. He was a pupil of Ginain and of Hippolyte Lebas, and had obtained the Achille Leclerc prize in 1860 and the Blouet prize in 1870, and a medal in the Salon of 1873. Among his numerous works are the Monument de la Défense at Dijon, the restoration of the Palais de Justice of the same town, and a number of buildings in and around Paris.

INDIA.—A new railway station is being erected at Mooltan cantonment to replace the old Sind, Punjaub, and Delhi Railway station.——The District Board of Backergunge is preparing a scheme for a railway line from Barisal to Palhardi.——Extensive additions are being made to the Port and Shipping Office in Calcutta.——A large block of model dwellings recently erected in Elgin-road, Calcutta, has just been opened by the Lieutenant-Governor of Bengal. The new building contains sixty-seven rooms, each 12 ft. square, and is of three stories. When the whole dwellings scheme is completed it is believed that the health of the city will be considerably improved.——The Viceroy has accepted the scheme prepared by Mr. W. Banks Gwyther, F.R.I.B.A., for the Delhi Art Exhibition. The design provides for a large carriage porch, from which a spacious entrance hall is reached. Ranges of artisans' stalls run round the outside of the exhibition building. The offices, storage-rooms, &c., are situated opposite the public entrance. On the upper floor a hall and band-gallery is to be situated, as well as a broad promenade.——The additions to the public offices in Rangoon have cost thirty lakhs of rupees. ——The water-supply scheme for Amritsar municipality is estimated to cost twelve lakhs of rupees, and the local authorities have applied for the sanction of the Indian Government to carry out the work.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS. —Mr. Herbert Clarke, civil engineer, has removed his offices from 8, Grant's-lane, Boston (Lincolnshire), to Church-lane, in the same town.——Mr. E. Harding Payne, architect, has removed his offices from No. 28, John-street, Bedford-row, to No. 11, in the same street——Mr. Christopher M. Shiner, architect, has removed his offices from 93, Bond-court, Walbrook, to 6, 7, and 8, Crutched Friars, E.C.

EXHIBITIONS: WOLVERHAMPTON AND CORK.—On the 1st inst. the Duke of Connaught opened an Art and Industrial Exhibition at Wolverhampton, which has been promoted at a cost of 100,000*l.* On the same day Cork International Exhibition was opened.

THE SIMPLON TUNNEL.—According to an official despatch received at the British Foreign Office, the piercing of the Simplon Tunnel on the Italian side has met with an unexpected obstacle in the shape of water, the flow of which amounts to over 11,000 gallons a minute. This occurred nearly six months ago, and since then very little progress has been made with the boring. The contractors recently issued a statement to the effect that it is not the water itself that has interfered with the boring, but the decomposed nature of the soil to be pierced and the necessity for strengthening the tunnel as it proceeds. They say they have still a good margin of time in hand, and that they feel sure of being able to complete the work within the period stipulated by the contract, namely, by May 13, 1904, unless other unforeseen difficulties should arise. The piercing on the Swiss side has proceeded uninterruptedly.

PROPOSED ABOLITION OF THE CITY ARCHITECTSHIP, ABERDEEN.—A meeting of the Committee of the Aberdeen Town Council appointed to deal with the question of the rearrangement of the Burgh Surveyor's Department was held on the 31st ult. The meeting decided on the abolition of the office of City Architect. For this purpose they resolved to ask the Burgh Surveyor to draw up a report showing what extra staff he would require in his office in order to enable him to overtake the work at present performed by the City Architect. The finding of the Committee was unanimous.

CAPITAL AND LABOUR.

STRIKE OF LABOURERS IN THE STOURBRIDGE BUILDING TRADE.—The bricklayers' labourers in the building trade in Stourbridge and the surrounding district within an area of three miles came out on strike on the 1st inst. for an advance of wages. They have not had a standard rate of wages hitherto, and ask all round for 5½d. an hour, which in many cases would be an advance of 1d. per hour. The bricklayers and carpenters in the district have also been asking for an advance, but the Employers' Association have just come to an agreement with the bricklayers and, practically, also with the carpenters. The questions raised in their case have for the most part been a matter of the arrangement of working rules.

LEGAL.

IMPORTANT TRADE UNION APPEAL.

THE case of Read *v.* The Friendly Society of Operative Stonemasons and Others came before a Divisional Court of King's Bench, composed of the Lord Chief Justice of England, Mr. Justice Darling, and Mr. Justice Channell, on the 3rd inst., for judgment on an appeal by the plaintiff from the decision of the Judge of the Ipswich County Court giving judgment for the defendants.

In this case the plaintiff brought the present action against the defendants for damages for wrongfully and maliciously inducing Messrs. Wigg & Wright, of Ipswich, to break a contract of apprenticeship by which plaintiff was bound to them for three years as a stonemason. The apprenticeship deed was dated June 1, 1900, at which date the plaintiff was twenty-five years of age. By this deed plaintiff covenanted to serve Messrs. Wigg & Wright for the term of three years at the wages of 15s. a week, his employers covenanting, on the other hand, to teach him the trade. Messrs. Wigg & Wright and the men employed by them were members of the defendant Society. The masters and men had drawn up certain rules, which Messrs. Wigg & Wright had agreed to and signed. Rule 6, which applied to Ipswich and district, was to the following effect:—"Apprentices.—That boys entering the trade shall not work more than three months without being legally bound apprentice, and in no case to be more than sixteen years of age, except masons' sons and stepsons. Employers to have one apprentice to every four masons on an average." At a lodge meeting of the defendant Society on August 13, 1901, a resolution was passed that if the plaintiff started work for his firm as a mason, one of their employees was to report the fact in two hours. In consequence of the action of the Society from August 13, 1900, to May 20, 1901, Messrs. Wigg & Wright failed to employ Read as a stonemason, or to teach him the trade; but Read continued to do the work of a labourer. On May 20, 1901, the secretary of the Society wrote to Messrs. Wigg & Wright that the members of the Society considered the firm's action an infringement of Rule 6 and stating that if Read started working at the trade they were compelled to protest against the firm for introducing an individual not of the trade, and that the Society had under their general rule empowered their members working for the firm to take prompt action in the matter. It was admitted by the defendants that "to take prompt action" meant that the men in the firm's employ should give two hours' notice and leave their employ if they thought fit. The County Court Judge held that the plaintiff had no cause of action against the defendants, who had acted bonâ fide in the interest of the Society, and from no improper motive, even though their interpretation of the rule might not be correct. From this decision the plaintiff now appealed.

The arguments on the appeal by Mr. Henlé for the appellant (plaintiff), and Mr. Chester-Jones for the respondents (defendants), concluded on the 16th ult., when judgment was reserved.

Mr. Justice Darling read his judgment, in the course of which he said he thought that the County Court Judge had come to a wrong conclusion, and that there ought to be a new trial. The plaintiff, by virtue of the contract he had entered into, had the right to demand that Messrs. Wigg & Wright should teach him the trade, and to interfere with that right might give a cause of action against those who did so. It had been argued for the defendants that they were justified in what they did because they had entered into a contract with Messrs. Wigg & Wright themselves, the terms of which were inconsistent with the contract between that firm and the plaintiff. It might be that a person, or many persons acting in concert, had a right to demand the fulfilment of a contract entered into with him or them, even though the consequence of such fulfilment necessitated him who performed it breaking a contract made by him with somebody else. But the contract the defendants set up was one which, if proved, might, by reason of its being in restraint of trade, be incapable of being enforced, and in that case there could be no sufficient justification to seek to hold Messrs. Wigg & Wright to it. There was not sufficient evidence to prove whether there was a contract between Messrs. Wigg & Wright and the defendants. Whether the contract was legal or illegal could only be determined when its terms and the parties to it were ascertained.

Mr. Justice Channell agreed with the judgment of Mr. Justice Darling.

The Lord Chief Justice also read his judgment, in which he said he considered the decision of the learned County Court Judge was unsatisfactory. But the question which presented the most difficulty to his mind was whether the facts before the Court enabled it to finally decide the question raised in the action. The evidence in this case

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established that the defendants, instead of taking action against Messrs. Wigg & Wright for a breach of contract, if there were a contract embodied in the rules of the Society, procured for their own personal ends Messrs. Wigg & Wright to commit an actionable wrong, viz., to break the terms of a special contract with the plaintiff. He felt some doubt whether the arrangement embodied in the rules was protected by the Trade Union Act, 1871, but it might be that Section 3 was sufficient to prevent the Court from holding that, if the rule amounted to an agreement between Messrs. Wigg & Wright and the defendants, it was void or voidable. This was a contract by the plaintiff, a man of full age in his own right. The provision as to one apprentice to every four masons caused some difficulty, but assuming the rule to be binding on Messrs. Wigg & Wright, he thought the defendants had no right to bring pressure to bear to procure Messrs. Wigg & Wright to break their contract with the plaintiff. There was nothing to show that the Society or any of its members would be injured by Messrs. Wigg & Wright's fulfilment of the contract with the plaintiff, or that the action was taken on behalf of individuals to protect their own interests. He thought that the County Court Judge should have entered judgment for the plaintiff, but as his learned brothers were not prepared to go so far, there could only be judgment for a new trial.

The appeal was accordingly allowed, and a new trial ordered.

Leave to appeal was granted.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

385.—PROCESS OF BRICK MOULDING: *J. S. Pullan and W. H. Mann.*—A machine which is claimed as being especially adapted for pressing sand-faced bricks, comprises a mould whereof the two parts, having their sides inclined, are forced together diagonal-wise by means of vertical wedges, upon the fall of the upper plunger. The wedges have screwed rods that slide through the upper cross-head; between them and the cross-head are interposed cushioning springs. On to the framework of the machine is bolted a moulding frame, against the inclined surfaces of which will slide the similarly inclined surfaces of the two sections of the mould.

437.—DRAUGHT APPARATUS FOR BRICK KILNS: *J. P. B. Fiske.*—The portable apparatus is devised for continuous and other kilns; in one of the former a row of openings is made in the roof of each chamber with grooved rings for their sand-luted covers, the blast-inducer comprises an electrically-driven fan at one end of a closed tube with branches to all of the openings of one chamber, it can be lifted with eyebolts to each of the chambers in turn by means of a crane, &c.; metallic screens are dropped through the openings and over the ports so as to prevent communication between any two of the chambers, in each instance the screen is weighted at its lower edge and is sustained by a plate which reposes upon a ledge on one side of the port; air and hot gases may be drawn through the chambers, or air may be impelled into the chamber that is being fired.

457.—PROCESS OF HARDENING ARTIFICIAL STONE: *C. Hörisch.*—Artificial stone and similar compounds are hardened with carbonic-acid gas, waste or exhaust gases, air or steam laden with silicate of soda, and other gases or vapours. The gas is forced into the moulded blocks through pipes or into cavities fashioned in the blocks. Its permeation is facilitated by the forming of a vacuum when the blocks are disposed in tiers. They can be separated with closed rings for adjustment of the openings which lead into the cavities.

458.—FACING-TILES OF GLASS: *A. J. Davis.*—In order that glass plates, made of opal, for facing walls, shall adhere to the cement they are roughened by the application of a saturated solution of hypo-sulphite of soda, and are heated. They are then cut into suitable shapes, and a stone or wheel and emery or sand are used for making grooves in the rough backing.

481.—MEANS FOR VENTILATING CLOSETS: *A. Drouillard and E. I. Scully.*—At the rear of the basin is a frame which carries a water-wheel and a co-axial fan; a spring valve in the service-pipe is mounted underneath the hinged seat, which, when depressed, will cause the valve to open and deliver a jet of water that drives the wheel, a passage into the basin being provided for the exhaust water. Other passages will at the same time exhaust the air. For a range of closets, communication from the pipe to the basin is effected by the lowering of the seat, each of the seats being hinged on to the ventilating-pipe that is common to all of them. A starting-valve is provided under each seat, whilst the exhaust-fan is common to the range of seats.

500.—ELECTRICAL COUPLINGS: *T. Henwood and Reason Manufacturing Co.*—The couplings are more especially intended for connecting branches that have two conductors to concentrical cables which have three conductors. A fitting for connecting the inner conductors comprises a semi-cylindrical casting, projections from which can be clasped around the ends of the tee-piece when it has been affixed to the main and the branch has been inserted into the tubular portion. A frame or tee-shaped bar having three split collars at its ends forms a connecting piece for the outer conductors, binding-wires secure the ends of the conductors and the collars are put upon the insulation. A bar fitted with the collars will serve for a simple connexion of the inner conductors.

542.—A HINGE FOR CLOSET-SEATS AND OTHER PURPOSES: *C. Evans.*—The inventor fastens the leaf that carries the socket on to the back rail, and affixes two other leaves with pins to the seat-lid and the seat respectively; he causes the pins to engage with the opposite sides of the socket.

558.—IMPROVEMENTS IN FLUSHING APPARATUS: *J. Duckett and Son, A. Duckett, F. S. Bulton, and J. W. Bullock.*—Over a tipping-tank is set a dished cover into which the sink discharges. Pipes from the tank convey the flushing water into a basin, across the back of which the flushing-channel is extended. The channel has a plug that closes its end.

568.—DISCONNECTIBLE COUPLINGS AND BUTT JOINTS FOR PIPES: *D. Hurst.*—Butt joints for malleable or flexible pipes of lead or indiarubber, and for hose, are made by inserting cone-shaped ferrules into the pipes or hose, and by means of external sleeves, whereof the one is screwed for taking the coupling-nut, and the other has a shoulder. Only one internal ferrule is needed for securing a flexible or malleable pipe to a flanged pipe of some hard metal. Indiarubber external sleeves are used for a butt-joint with woven hose. For the two ferrules may be substituted one single ferrule, and corrugated sleeves and ferrules may be used. Confer also No. 16,349 of 1899.

573.—APPLIANCES FOR WINDOWS AND DOORS: *J. E. Bundy and J. A. Conne.*—The inventors contrive that when a door has been shut a projection at the bottom of the door shall impinge against a weather-strip or movable part of the sill so as to tilt it about its outer edge to bring the inclined surface into the vertical plane and press it against the outer face of the door. The ends of the weather strip fit into recesses cut in the side of the frame. For double doors or casements a bevelled leaf, which under normal conditions remains closed, enables the strip to rise when the acting leaf is shut. The latter leaf is bevelled diagonal-wise upon the hinged side of the door.

592.—IMPROVEMENTS IN KILNS: *W. P. Grath.*—Each furnace of a single kiln is placed in direct communication with the bag flue at the adjacent side of the kiln, and with the corresponding bag flue at the opposite side, by means of flues beneath the floor. The distribution of the products of combustion is regulated with dampers, and they are dissipated from any one furnace in the adjoining flue with baffles. For a kiln after the continuous kind there are branch flues from the main chimney flue that convey waste gases from one chamber along the flues beneath the next chamber, whereby it will be heated for a drying of its contents.

623.—FLUSHING CONTRIVANCES: *W. Murchland.* The inventor seeks to minimise noise by causing the inlet to dip into one compartment of a container which is fastened to one side within the tank. Water flows over from that compartment into the body of the cistern as well as into the other division of the container, out of which an auxiliary siphon leads into the principal siphon for the discharge. The lesser siphon serves to effect an after-flush.

645-6.—GAS-LIGHTING AND GAS-BURNING APPLIANCES: *R. Beese.*—As a thermostatical device becomes heated by the main flame it is moved, together with a tube, of which the upper carries a self-ignition contrivance, so that the lower end of the tube shall clear the gas aperture of the burner. The thermostatical contrivance will resume its former position as it becomes cool after the extinction of the flame, whereupon the lower end of the tube will be projected over the gas aperture in order that the gas when it is next turned on shall flow up the tube, to be ignited by the igniter and so to light the burner.

646.—A flange for the adjustment of a sleeve upon a union having many gas-ways is devised for regulating at one and the same time the supplies of air and gas to the mixing-tube of the burner; when the sleeve has been adjusted an orifice in the gas nozzle upon the sleeve will be opened, to a greater or less degree, by a conical projection from the fitting, whilst a hit-and-miss valve, which is formed by an extension from the upper portion of the sleeve, will to a similar extent open the air-supply apertures.

677.—IMPROVEMENTS IN CLOSET-BASINS: *W. Hassall, P. H. Mellor, and A. H. Brook.*—For a flushing-horn and scroll the inventors provide that the flush water shall be directed to both the right and left by means of a wedge-shaped plate which they insert opposite the flushing-inlet; the plate may be variously affixed and be also made in one piece with the basin.

683.—CONSTRUCTION OF A DRYING-SHED FOR BRICKS: *H. Hemming.*—A foundation layer of hard cement or asphalte forms the floor over which is laid a course of open brickwork having flues and spaces arranged crosswise and lengthwise in it, with another layer to cover the flues, and a top layer of blue bricks. At one end of the shed exhaust or waste steam is conveyed into the flues, and inclined passages are provided for the escape of the used steam and water of condensation. The drainage of water may also be facilitated by laying the flues, and it may be the floor too, at an incline. There are middle non-perforated flues which convey steam to the spaces or flues that are more remote from the inlet flue, and columns, after the ordinary kind, carry the roof.

738.—EXTINCTION OF FIRE: *R. Hoult.*—A compound to be thrown into the flames consists of an admixture of sodium bicarbonate and fuller's earth, with which may be combined another admixture which contains pipeclay, ochre, salt, "metallic brown," and ammonium phosphate; the latter compound may, however, be used separately.

770.—LOCKING AND FASTENING APPLIANCES: *H. W. Eicher, H. G. Will, and G. H. Duncombe.*—For locking and fastening doors the inventors devise two cylinders which they screw on to a face-plate, a sliding-bolt in the upper cylinder, guided by a partition, has arms which are joined to a head, at that end (being remoter from the face-plate) of the cylinder are springs which press against the head. To the knob spindle is attached a ratchet-wheel which engages with ratchet-plates, each of which consists of prong-pieces and a body, that slide upon the inner surfaces of the arm. As one frees the bolt by turning the knob, the ratchet-plates will be moved in opposed directions until the bolt is moved by the contact of the end of a plate with the head, the springs will then cause the bolt to assume the position for locking. In the lower cylinder is a partition that guides the locking-bolt which has recesses that engage with a projection from a rod which the end plate of the cylinder maintains in its place. The key will raise a stem upon the bolt in order that the one or the other of the recesses in the locking-bolt shall be thrown into engagement with the projection from the rod when one desires to shoot, or to draw back, the bolt, which is kept in engagement with the projection with a spring above it. The cylinders are inserted into holes bored in the edge of the door, and the combined appliance is screwed on to the face-plate of the lock.

772.—CONSTRUCTION OF FLOORS: *E. Goekst.*—Wooden or metallic strips are inserted into inclined saw-cuts formed in the under sides of the boards, which will serve for the general flooring or for the border alone. The ends of the metallic strips can be clinched outside the boards; the strips may be either plain, or crimped, flanged, serrated, and so on, and they can be laid in the saw-cuts either angle-wise or parallel-wise, and set at various angles in respect of the edges of the boards.

MEETINGS.

FRIDAY, MAY 9.

Architectural Association.—(1) Mr. Owen Fleming on "Artisans' Dwellings from the Municipal Point of View"; (2) Mr. Louis Ambler on "Artisans' Dwellings from the Private Point of View." 7.30.

SATURDAY, MAY 10.

Institution of Junior Engineers.—Visit to the Great Eastern Railway Works, Stratford. Train from Liverpool-street at 9.17 a.m.

Northern Architectural Association.—An Excursion Meeting. Members to assemble at the Northern Wood Haskinizing Co.'s Works, Walker-on-Tyne, at 3.30 p.m.

MONDAY, MAY 12.

Bristol Society of Architects.—Professor Beresford Pite on "Street Architecture," with limelight illustrations. 8 p.m.

THURSDAY, MAY 15.

Royal Institution.—Mr. A. Smith Woodward, LL.D., F.R.S., on "Recent Geological Discoveries." III. 3 p.m.

Society for the Encouragement of the Fine Arts.—Mr. Philip H. Newman on "Pageantry and Art." 8 p.m.

Institution of Electrical Engineers (*Society of Arts, John-street, Adelphi*).—Professor C. A. Carus-Wilson on "Electrical Traction on Steam Railways in Italy." 8 p.m.

FRIDAY, MAY 16.

Royal Institution.—Sir Robert Ball on "The Nebular Theory." 9 p.m.

Institution of Mechanical Engineers.—Conversazione. 9 p.m.

SATURDAY, MAY 17.

Edinburgh Architectural Association.—Visit to Hamilton.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 23.—By WM. WEATHERHEAD (at Keighley).

Laycock, Yorks.—12 closes of land, 26 a. 2 r. 11 p., f. £1,050
Freehold farmhouse and 16 a. 1 r. 3 p. 1,200
Bingley, Yorks.—Clay Hall holding, 2 a. 2 r. 14 p., f. 450
Long Lee, Yorks.—Freehold house, w.r. 10*l.* 8*s.*... 150

By STEPHENSON & ALEXANDER (at Pontypridd).

Pontypridd, Glamorgan.—Rhondda-rd., New Bridge Mill Field, 3 a. 2 r. 2 p., f. 2,250
Treforest, The Woodlands, f., p. 300

April 24.—By HEPPER & SONS (at Leeds).

Leeds,—North-st., three building sites, area 444 yds., f. 5,000
Bishopgate-st., building site, area 342 yds., f. .. 5,150

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1, 3, 5, and 7, Bunt-st., and 2 and 4, Milton-st., area 183 yds., f. £580
Waterloo-rd., seven building sites, area 840 yds., f. 4,109
Askern-st., six building sites, area 575 yds., f. .. 431
Anchor-rd., triangular site, area 746 yds., f. 700
Cross Myrtle-st., five building sites, area 400 yds., f. 221
14 to 20 (even), Ebony-st. and four cottages in rear, area 940 yds., f. 650
East-st., two building sites, area 321 yds., f. .. 550
East-st., building site, area 3,431 yds., f. 2,573

April 25.—By WALTER LUDLOW & BRISCOE (at Birmingham).
Pershore, Worcester.—Bryn Issa Estate, 87 a. 3 r. 10 p., f. 9,500

By HEPPER & SONS (at Leeds).
Leeds.—Street-lane, two building sites, area 39,396 yds., f. 7,320
Park-lane, ten building sites, area 171,270 yds., f. 19,122
Addyman Wood-rd., &c., five sites, area 101,597 yds., f. 5,187

April 28.—By ELLIOTT, SON, & BOYTON.
Regent's Pk.—12, Park-sq. West, and 10, Park-sq.-mews, u.t. 21 yrs., g.r. 8*l.* 10s., p. 2,880

By MAY & PHILPOT.
Brixton.—23, 25, and 27, Fairmount-rd., u.t. 89 yrs., g.r. 21*l.*, e.r. 135*l.* 1,380
68, Helix-rd., u.t. 88 yrs., g.r. 7*l.*, e.r. 45*l.* 490
Streatham.—4, Hillside-rd., u.t. 74 yrs., g.r. 15*l.* 15s., p. 700

By MULLETT, BOOKER, & Co.
Hyde Park.—14, Great Cumberland-pl. u.t. 19 yrs., g.r. 10*l.*, y.r. 210*l.* 1,900
Portman-sq.—30, Portman-mews South, u.t. 19 yrs., g.r. 1*l.*, y.r. 60*l.* 590

April 28.—By FRED. VARLEY & SON.
Hackney.—155, Graham-rd., u.t. 67 yrs., g.r. 2*l.*, e.r. 50*l.* 550
Finsbury Park.—51, Finsbury Pk.-rd., u.t. 65 yrs., g.r. 9*l.* 9s., e.r. 52*l.* 500

By J. H. BETHELL (at Forest Gate).
Manor Park.—Northumberland-av., &c., 76 plots of freehold building land (in lots) 8,839

By ROBERTS, SON, & TORY (at Seaton).
Seaton, Devon.—Fore-st., Chestnut Lodge, f., p. . 700

By P. M. PUCKRIDGE (at Swindon).
Aldbourne, Wilts.—Ford Farm, 300 a. 1 r. 23 p., f. 3,000
Hodders enclosure, 19 a. 3 r. 12 p., f. 260
The Rectory and 4 a. 2 r. 4 p., f. 785
Castle-st., four cottages and 1 r. 7 p., f. 170
The Butts, four freehold cottages 118
Chiseldon, Wilts.—Smart's Piece enclosure, 13 a. 3 r. 23 p., f. 415

April 29.—By DEBENHAM, TEWSON, & Co.
Bayswater.—113, Westbourne-grove (S), and 41, Hereford-rd. (S), f., y.r. 335*l.* 8,600
8, Cornwall-rd., u.t. 54½ yrs., g.r. 10*l.*, p. 600
Paddington.—13, Chichester-st. (S), u.t. 40½ yrs., g.r. 10*l.*, y.r. 60*l.* 560

By JOHN BOTT & SONS.
Clapham.—52, 54, and 74, Paradise-rd., u.t. 35 yrs., g.r. 12*l.*, w.r. 133*l.* 18s. 660
Wandsworth.—337, Earlsfield-rd., u.t. 79 yrs., g.r. 6*l.*, w.r. 39*l.* 230

By DUNCAN & KIMPTON.
Clapham.—Rectory-grove, f.g.r. 20*l.*, reversion in 16 yrs. 1,060
Turrett-grove, f.g.r.'s 46*l.* 4s., reversions in 20 to 26 yrs. 2,140
Battersea.—12, Lavender-ter., u.t. 75 yrs., g.r. 4*l.* 10s., w.r. 31*l.* 4s. 250
Balham.—30, Cloudesdale-rd., u.t. 88 yrs., g.r. 6*l.* 10s., e.r. 42*l.* 470
Westcliff-on-Sea, Essex.—22, St. Helen's-rd., f., y.r. 42*l.* 625

By FISHER, STANHOPE, & DRAKE.
Stamford Hill.—26, Dunsmure-rd., u.t. 81½ yrs., g.r. 8*l.* 8s., e.r. 60*l.* 650
38, Bergholt-cres., u.t. 83 yrs., g.r. 7*l.* 10s., y.r. 48*l.* 520

By FURBER, PRICE, & FURBER.
Hatton Garden.—30, Kirby-st., area 1,580 ft., f., y.r. 100*l.* 2,550
33, 34, and 35, Kirby-st., area 4,560 ft., f., p. .. 7,250

By J. S. RICHARDSON.
Hammersmith.—95, Shepherd's Bush-rd., u.t. 82 yrs., g.r. 10*l.* 10s., e.r. 60*l.* 630
Stratford.—Blyth-rd., a plot of land, with stable thereon, area 3,100 ft., u.t. 44 yrs., g.r. 3*l.* 10s., y.r. 10*l.* 230

By F. WARMAN.
Crouch End.—42, Coolhurst-rd., u.t. 80 yrs., g.r. 15*l.* 15s., e.r. 90*l.* 1,100
7, Palace-rd., u.t. 76 yrs., g.r. 8*l.* 10s., e.r. 45*l.* .. 370
Canonbury.—53, Marquess-rd., u.t. 44 yrs., g.r. 10*l.*, e.r. 60*l.* 600
Southgate.—Chase Side, The Oaks, f., p. 925

By SEDGWICK, SON, & WEALL (at Rochester).
Frindsbury, Kent.—Orchard Meadow, 1 a. 3 r. 3 p., f. 100
Four enclosures of land, 32 a. 0 r. 34 p., f. 610
Long Land Field, 8 a. 3 r. 1 p., f. 205
Hayden-st. Field, 9 a. 2 r. 26 p., f. 360
Noke-st. Farm, 21 a. 0 r. 30 p., f. 880

By ORGILL, MARKS, & LAWRENCE (at Masons' Hall Tavern).
Neasden.—High-rd., The Old Spotted Dog p.-h., u.t. 26 yrs., y.r. 100*l.*, with goodwill 21,130

By HEPPER & SONS (at Leeds).
Headingly, Yorks.—Richmond-rd., Richmond House, area 4,823 yds., f., p. 1,400
April 30.—By BAXTER, PAYNE, & LEPPER.
Sidcup, Kent.—Longlands Pk.-rd., Clevedon, f., q.r. 32*l.* 510
Sidcup Hill, Brantingham, f., y.r. 65*l.* 1,045
Foots Cray, Kent.—Foots Cray Hill, Surbiton Villa, f., y.r. 40*l.* 655

By W. A. BLAKEMORE.
Southwark.—12 and 13, Bankside, also C, D, E, F, and G warehouses, Horseshoe-alley in rear, u.t. 80 yrs., g.r. 825*l.*, y.r. 1,715*l.* 6,600
Norbiton, Surrey.—9 and 13, Clifton-rd., u.t. 68 yrs., g.r. 14*l.*, y.r. 62*l.* 545
Shenley, &c., Herts.—Colney Pk. Stud Farm, 76 a. 1 r. 1 p., f. 4,800

By MOSS & JAMESON.
Regent's Park.—10, 11, 12 and 13, Culworth-st., u.t. 25½ yrs., g.r. 32*l.*, y.r. 190*l.* £1,300
St. John's Wood.—18, Acacia-rd., u.t. 31½ yrs., g.r. 10*l.*, y.r. 48*l.* 365
Hampstead.—12, Lancaster-rd., u.t. 50 yrs., g.r. 12*l.*, e.r. 70*l.* 435
Camden Town.—25, Arlington-rd., u.t. 33½ yrs., g.r. 4*l.*, y.r. 48*l.* 435

By R. TIDEY & SON.
Hoxton.—57 to 71 (odd), Canal-rd., u.t. 14¾ yrs., g.r. 6*l.* 8s., w.r. 255*l.* 12s. 575

By HENRY HENDRIKS (at Birmingham).
Edgbaston, Warwick.—98, Bristol-rd., u.t. 42 yrs., g.r. 10*l.* 12s., p. 1,300
Saltley, Warwick.—Salisbury-rd., Hope Cottage and Clevedon Cottages (two), f., w.r. 41*l.* 12s. 500
Salisbury-rd., two plots of land, f. 242

By G. C. LAMBERT (at Croydon).
Croydon.—Montague-rd., f.g.r. 10*l.*, reversion in 956 yrs. 300
19, Montagu-rd., f., w.r. 29*l.* 18s. 380
87, London-rd., f., y.r. 70*l.* 1,050
Addiscombe.—40, Outram-rd., u.t. 52½ yrs., g.r. 15*l.*, e.r. 75*l.* 500

By HEPPER & SONS (at Leeds).
Headingley, Yorks.—Morley-rd., Morley House, and 3 a. 3 r. 5 p., f., p. 5,900

May 1.—By BEALE & CAPPS.
Notting-hill.—2, Blagrove-rd., f., y.r. 35*l.* 550

By GIBBS & WINTERTON.
Leyton.—Oliver-rd., Stock Villa, f., e.r. 45*l.* 515
Clapham.—26, Thornbury-rd., u.t. 80 yrs., g.r. 6*l.* 10s., y.r. 38*l.* 330

By J. HOOD & SONS.
Old Ford.—26, 28, 30 and 32, Gardeners-rd., u.t. 34 yrs., g.r. 15*l.*, w.r. 114*l.* 8s. 700

By NEWBON, EDWARDS & SHEPHARD.
Finsbury Park.—54, Wiberforce-rd., u.t. 65 yrs., g.r. 8*l.*, e.r. 48*l.* 525
South Lambeth.—36 to 50, Park Mansions (flats), u.t. 92½ yrs., g.r. 115*l.*, e.r. 638*l.* 8s. (including mortgage) 3,600
Highbury.—1, Ancona-rd., u.t. 79 yrs., g.r. 7*l.* 10s., y.r. 34*l.* 385
Holloway.—14 and 16, Nicholay-rd. (warehouses, &c.), u.t. 79 yrs., g.r. 15*l.*, y.r. 120*l.* 1,650
97, 99 and 101, Andover-rd., u.t. 55 yrs., g.r. 7*l.*, w.r. 78*l.* 635
Barnsbury.—28 and 30, Charlotte-ter., u.t. 18¾ yrs., g.r. 10*l.* 10s., y.r. 58*l.* 360

By SALTER, REX, & Co.
Kentish Town.—17, Torriano-av., u.t. 41½ yrs., g.r. 7*l.* 10s., y.r. 40*l.* 380
5, Wilkin-st. (S.), u.t. 65 yrs., g.r. 6*l.*, y.r. 42*l.* 480

By STIMSON & SONS.
Bexley, Kent.—Heathend-rd., f.g.r. 14*l.*, reversion in 93 yrs. 310
Peckham.—10 and 11, Colyton-rd., u.t. 90 yrs., g.r. 18*l.*, y.r. 120*l.* 1,400
Camberwell.—69, Shenley-rd., u.t. 74 yrs., g.r. 6*l.*, y.r. 34*l.* 365
Bermondsey.—85 and 87, Rouel-rd., u.t. 32¾ yrs., g.r. 10*l.*, w.r. 78*l.* 510

By BLACKFORD & SONS (at South Molton).
South Molton, Devon.—Cheney Farm, 31 a. 1 r. 6 p., f. 1,275
Rose Ash, Devon.—New Meadow Closes, 11 a. 1 r. 23 p., f. 202

By WORSFOLD & HAYWARD (at Dover).
Dover, Kent.—7, 9, and 11, Hillside-rd., f., w.r. 39*l.* 405
152, Clarendon-pl., f., w.r. 18*l.* 4s. 210

By LEWIS & BADCOCK (at New Milton).
Milton, Hants.—Milton Nursery and Old Fernhill Copse, Building Estate, 30 a., f. 3,000

By HENRY HENDRIKS (at Birmingham).
Gilbert's Green, Warwick.—Broad-lane, freehold farm, 15 a. 3 r. 14 p. 890

May 2.—By NOAKES & NOAKES.
Clerkenwell.—11, Albermarle-st. (warehouse), u.t. 56 yrs., g.r. 28*l.*, y.r. 100*l.* 900
Homerton.—134, High-st. (S), u.t. 64½ yrs., g.r. 19*l.*, y.r. 48*l.* 400

By A. PREVOST & SON.
Mile End.—1 and 2, South-grove, with stabling, workshops, and yard, area 8,000 ft., u.t. 23 yrs., g.r. 60*l.*, w.r. 254*l.* 16s. 675
West Ham.—1 to 6, Curtis-st., u.t. 65½ yrs., g.r. 12*l.*, w.r. 79*l.* 6s. 455
65 and 67, Union-rd., with plot of land in rear, u.t. 73 yrs., g.r. 10*l.*, w.r. 77*l.* 12s. 545
Stepney.—75, Shandy-st., u.t. 15 yrs., g.r. 4*l.* 6s. 3d., w.r. 32*l.* 10s. 110
Bow.—32, Athelstan-rd., u.t. 52 yrs., g.r. 4*l.* 4s., w.r. 37*l.* 14s. 340
Stamford Hill.—42, Linthorpe-rd., u.t. 86 yrs., g.r. 7*l.* 10s., y.r. 50*l.* 600
Ilford, Essex.—Valentine-rd., a plot of freehold land 275

By RAYNER & JULIER.
Croydon.—101, London-rd., f., p. 1,875

By RIDER & SONS.
Notting-hill.—27, 32, and 33, Clifton-st., u.t. 58 and 60 yrs., g.r. 15*l.* 5s., w.r. 93*l.* 12s. 625
40 and 42, Blechynden-st., u.t. 60½ yrs., g.r. nil, w.r. 78*l.* 545
13 and 14, Talbot-mews, u.t. 48½ yrs., g.r. 25*l.*, y.r. 35*l.* 225

By TRAFFORD & CARTER.
Hammersmith.—99 and 101, The Grove (S.), u.t. 65 yrs., g.r. 18*l.*, y.r. 100*l.* 1,185
Fulham.—139, 141, and 143, Lillie-rd. (S.), u.t. 69½ yrs., g.r. 29*l.*, y.r. 128*l.* 1,220
Whitechapel.—54 and 55, Greenfield-st., f., w.r. 130*l.* 1,630
Tottenham.—74 and 76, Bruce Castle-rd., f., w.r. 52*l.* 565

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; w.r. for weekly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 11 0	per 1,000 alongside, in river	
Rough Stocks and Grizzles	1 9 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 5 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts ..	1 12 0	,,	,, ,,
Best Fareham Red	3 12 0	,,	,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,,	,, ,,
Do., Bullnose	4 11 0	,,	,,
Best Stourbridge Fire Bricks	4 6 0	,,	,, ,,

GLAZED BRICKS

Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers..	16 0 0	,,	,,
One Side and two Ends	19 0 0	,,	,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers..	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0 ,,	,,
Best Portland Cement	31	0	per ton, delivered.
Best Ground Blue Lias Lime..	25	0 ,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 10s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depot.
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 3	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks ..	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	s. d. 2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt
,, ,, ,, 6 in. sawn both sides landings	2	7 per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1	2½ ,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	12 0 0	per 1000 of 1200 at ry. dep.
,, best seconds ,,	11 10 0	,, ,,
16×8 best ,,	6 15 0	,, ,,
20×10 best blue Portmadoc ..	11 5 0	,, ,,
16×8 best blue Portmadoc	6 0 0	,, ,,
20×10 best Eureka unfading green....	12 2 6	,, ,,
16×8 ,, ,,	7 5 0	,, ,,
20×10 permanent green	10 5 0	,, ,,
16×8 ,, ,,	5 17 6	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles..	41 6	per 1,000, at rly. depôt.
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3 9	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,

[*See also page 485.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*Town Hall and Municipal Offices	Deptford Borough Council	100*l.*, 75*l.* and 50*l.*	Aug 30

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Brick Culvert, Aston Manor, Birmingham	.....	G. H. Jack, Civil Engineer, Council House, Aston Manor	May 12
*House, Newton-street, Cyres, Devon	.....	Ellis & Co., Surveyors, Bedford Chambers, Exeter	May 13
Alterations to Chapel, Cemlyn, near Amlwch	.....	J. Owen, Architect, Menai Bridge, N. Wales	do.
Cast Iron Water Mains, Earlston, N.B.	.....	T. R. Atkinson, Civil Engineer, William Bank, Earlston	do.
Drainage Works at Schools	.....	J. Little, Engineer, Viaduct Chambers, Carlisle	do.
Drainage Works	Carlisle School Board	T. H. Cornish, Parade-street, Penzance	do.
Sewerage Works, Abercynon-road	Gulval (Cornwall) School Board	H. P. Linton, Town Hall, Mountain Ash	do.
Street Improvement Works, Dryden-street, &c	Mountain Ash U.D.C.	Borough Engineer, Town Hall, Bootle	do.
Bridge Widenings, near Preston	Bootle (Lancs.) Corporation	County Bridgemaster's Office, Preston	do.
*Storage Reservoir at Barnattin	Lancs. County Council	G. N. Kelly, Civil Engineer, Gas and Water Offices, Drogheda	do
Stabling and Cottages, Birkenshaw, Yorks	Drogheda Corporation Waterwrks.	Walker & Collinson, Architects, Swan-arcade, Bradford	May 14
Alterations to School, Arklow, Ireland	.....	H. Annesley, 29, Main-street, Arklow	do.
House, Cathcart Net Factory, Buckie, N.B.	.....	W. Marshall & Co., Buckie	do.
Sixty-five Houses, Skewen, Wales	.....	J. C. Rees, Architect, Neath	do.
Promenade Works, Walney	.....	Borough Engineer, Town Hall, Barrow	do
Chimney Shaft	.....	F. C. Ruddle, Architect, Union Offices, Blackburn	do.
Three Houses, The Villas, Egremont, Cumberland	Mr. E. E. Bevan	J. S. Stout, Civil Engineer, 36, Lowther-street, Whitehaven	do.
House at Chapel, Egremont, Cumberland	Barrow-in-Furness Corporation	do.	do.
Paving, &c., Wellington-street and others	Blackburn Guardians	W. Welburn, Borough Surveyor, Town Hall, Middleton	do.
Rebuilding the Salutation Inn, London-rd., Coventry	Mr. R. Nelson	H. W. Chattaway, Architect, Trinity Church Yard, Coventry	do.
Court House, Padiham	.....	H. Littler, Architect, County Offices, Preston	do.
Building Flats, Potter-street, &c.	Middleton (Lancs.) Corporation	J. Price, Engineer, Council House, Birmingham	do.
Additions to Factory, Avonvale-rd., St. Geo., Bristol	Messrs. Phillips & Marriott, Ltd.	H. Williams, Architect, Corn-street, Bristol	do.
Municipal Buildings, Grange-road	Lancs. County Council	F. Rennoldson, Architect, 37, King-street, South Shields	do.
Shops, &c., Fitzwilliam-street, Huddersfield	Birmingham Corporation	J. Kirk & Sons, Architects, Huddersfield	May 15
Chapel, Blaengarw, Wales	Messrs. Chappell, Allen & Co., Ltd	Mr. Hargest, Strand, Blaengarn	do.
Two Houses, Abertridwr, Wales	Jarrow Corporation	T. Jones, 147, Trehafod-road, Hafod, Pontypridd	do.
Twenty-nine Cottages	.....	Surveyor, Town Hall, Brentwood	do.
Residence, Bridlington	.....	J. Earnshaw, Architect, Carlton House, Bridlington	do.
Greenhouse, Stable, &c., Victoria Park	.....	W. H. Jukes, Surveyor, Public Offices, Tipton	do.
Electric Lighting Station, Park Foot	.....	D. Ronald, Engineer, Burgh Chambers, Falkirk	do.
Additions to Workhouse	Brentwood U.D.C.	W. H. Ward, Architect, Paradise-street, Birmingham	do.
*500 tons Blue Guernsey Granite	.....	Borough Surveyor, Town Hall, Bethnal Green	do.
*Cleaning and Painting Roof St. Pancras Station	Tipton Town Council	Company's Architect, Cavendish House, Derby	do.
Shop, Tir Phil, Wales	Falkirk (N B.) Town Council	T. V. Jones, Architect, Hengoed	May 16
Three Houses, Exwick, Exeter	Birmingham Guardians	Harbottle & Son, Architects, County Chambers, Exeter	do.
Granite and Slag	Metro. Borough Bethnal Green	F. E. Burton, High-street, Castle Donington	do.
Road Materials, &c.	Midland Railway Company	Town Clerk, Municipal Buildings, Middlesbrough	do.
House and Shop, Well-street, Cefn, Wales	.....	J. W. Hughes, Architect, Dee Hurst, Llangollen	do.
Hall, &c., Dunleer, Ireland	General Buller	J. F. M. Gahon, Architect, Dundalk	May 17
Rowley Ragstone	Castle Donington R.D.C.	H. Hulse, Borough Surveyor, Droitwich	do.
Two Villas, Bedale, Yorks	Middlesbrough Corporation	H. G. E. Merrin, South End, Bedale	do.
Several Houses, Ton Pentre, Glam.	Mr. Bowen	W. D. Morgan, Architect, Pentre, Rhondda Valley	do.
Well Sinking, &c.	.....	H. G. Keywood, Civil Engineer, Public Hall Chambers, Maldon	do.
Two House, Ballywilliam, Donaghadee, Ireland	Droitwich Corporation	W. J. Fennell, Architect, 2, Wellington-place, Belfast	May 19
Lecture Rooms at Training College, Dublin	.....	J. F. Fuller, Architect, 179, Great Brunswick-street, Dublin	do.
Waterworks, Kilcool, Ireland	Industrial Co-op. Society, Ltd.	B. Manning, The Workhouse, Rathdrum	do.
Bridge Works, Wedmore	Maldon (Essex) R.D.C.	W. Lunn, Engineer, Queen-street, Bridgwater	do.
Cast Iron Mains	.....	E. Jones, Engineer, Treforest	do.
Institute, Ynysybwl, Wales	.....	J. Rees, Architect, Pentre	May 20
Reservoir	Rathdrum R.D.C.	L. G. Hall, Civil Engineer, Paradise-street, Rhyl	May 21
*Painting, General Repairs, &c., at Infirmary	Somersetshire Drainage Commrs.	W. H. Chappell, Infirmary, Fulham-road, S.W.	do.
*Road-making, Paving and Lighting Works	Pontypridd U.D.C.	Borough Surveyor, Clattern House, Kingston-on-Thames	do
Fog Signal House, &c., near Whitby	.....	The Lighthouse, Whitby	May 22
*Schools at Roman Hill, Lowestoft	Rhyl U.D.C.	Clerk to the Board, 115, High-street, Lowestoft	May 23
*Retort House, &c.	St. George's Union	R. M. Couper, 3, Queen's-road, Brentwood	do.
*8,000 feet Granite Kerb, &c.	Kingston-on-Thames Corporation	Borough Engineer, Town Hall, Brighton	do.
*Covered Play Shed, &c.	Trinity House Corporation	Office of the Board, Embankment, E.C.	May 26
*New Infirmary	Lowestoft School Board	Guardians' Engineer, 3, Vinty-street, College Green, Bristol	do.
*Tar-paving Playgrounds of Schools	Directors, Brentwood G.C. & L. Co.	R. L. Curtis, Architect, 120, London Wall, E.C.	do.
Public Baths, Old Trafford, Manchester	County Borough of Brighton	E. Woodhouse, Architect, 88, Mosley-street, Manchester	May 27
Engineering and Boilers, &c., Public Baths	Metropolitan Asylums Board	do.	do.
*Hot-water Supply at Isolation Hospital, Stonebridge	Axbridge Board of Guardians	Engineer to the Council, Public Offices, Dyne-road, Kilburn, N.W.	do.
*Additions to Hospital, Thorpe	East Ham School Board	Farthing & Dunn, Architects, Newcastle-on-Tyne	May 28
*Hospital Buildings, Serpentine-rd., West Hartlepool	Stretford U.D.C.	Borough Engineer's Office, West Hartlepool	May 29
Chalet, Pitville Park	do.	Borough Surveyor, Municipal Offices, Cheltenham	May 30
Church and Schools, Stockton-on-Tees	Willesden U.D.C.	W. J. Morley & Sons, Architects, 269, Swan Arcade, Bradford	No date
Alterations to Chapel, Wrexham	Easington R.D.C.	T. G. Williams, Architect, 3, Cable-street, Liverpool	do.
Schools, Hyde Park, Doncaster	Borough of West Hartlepool	Athron & Beck, Architects, Dolphin Chambers, Doncaster	do.
Warehouse, Short Hill, Nottingham	Cheltenham Corporation	H. J. Price, Architect, 24, Low Pavement, Nottingham	do.
Institute, Outwood, near Wakefield	.....	Wilson & Co., Architects, 12, East Parade, Leeds	do.
Schools, Apperly Bridge	.....	Danby & Simpson, Architects, 10, Park-row, Leeds	do.
House, Waterloo-road, Hunslet, Leeds	.....	do.	do.
Offices, Queen's Dock Side, Hull	.....	Gelder & Kitchen, Architects, 76, Lowgate, Hull	do.
Schools, Ilkley	.....	Garside & Pennington, Architects, Pontefract	do.
Cottage, Harrogate	.....	France, Milnes & Co., Architects, 99, Swan Arcade, Bradford	do.
37 Houses, Beechwood Mount, Headingley, Leeds	.....	P. Robinson, Architect, 72, Albion-street, Leeds	do.
Additions to House, Bath-street, Hereford	.....	Brooks & Co., Architects, Palace Chambers, Hereford	do.
*Two Detached Houses, Pinner	.....	Clarke & Charles, Harrow-on-the-Hill	do.
*School, &c., Bloxwich, near Walsall	Messrs. Ingham & Sons	Hickton & Farmer, Architects, Walsall	do.
*Erection of Palace Theatre, Halifax	.....	R. Horsfall & Son, Architects, Halifax	do.
*Laundry Buildings, &c.	Mr. Jas. Parker	A. Marshall, Architect, King-street, Nottingham	do.
	.....		
	.....		
	Primitive Methodist Trustees		
	.....		
	Dudley Union		

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Assistant Clerk of Works	Walthamstow School Board	3*l.* 3*s.* per week	May 16
*Surveyor's Assistant	Hampton U.D.C.	100*l.*	May 17
*Clerk of Works	Old Brentford School Board	3*l.* 3*s.* per week	May 26

Those marked with an asterisk (*) are advertised in this Number. *Competition*, p. iv. *Contracts*, pp. iv. vi. viii. & x. *Public Appointments*, xviii. & xix.

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PRICES CURRENT (*Continued*).

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 0 0
Deals: best 3 by 9	13 10 0	15 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	10 10	11 10 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in. ..	8 10 0	9 10 0
2½ by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft.)	3 0 0	3 10 0

JOINERS' WOOD. At per standard.

White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
,, ,, 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
,, ,, ,, 3 in. by 9 in.	12 0 0	13 0 0
,, ,, ,, battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
¾ in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6

Per square.

Prepared Flooring— 1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

IRON—	Per ton, in London £ s. d.	£ s. d.
Common Bars	7 15 0	8 5 0
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 10 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	11 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -

PRICES CURRENT (*Continued*).

METALS.

IRON—	Per ton, in London. £ s. d.	£ s. d.
Sheet Iron, Galvanised, flat, best quality:—		
Ordinary sizes to 20 g.	16 0 0	- - -
,, ,, 22 g. and 24 g.	16 10 0	- - -
,, ,, 26 g.	18 0 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12 0 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 5 0	9 15 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 7 6	- - -
Pipe in coils	14 17 6	- - -
Soil Pipe	17 7 6	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0	- - -
Thin ,,	0 1 1½	- - -
Copper nails ,,	0 1 1½	- - -
BRASS— Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3½	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8½	- - -
Blowpipe ,,	0 0 10	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths	3d. ,, ,,
26 oz. thirds	4½d. ,, ,,
,, fourths	4d. ,, ,,
32 oz. thirds	5½d. ,, ,,
,, fourths	5d. ,, ,,
Fluted sheet, 15 oz.	3d. ,, ,,
,, 21 ,,	4d. ,, ,,
½ Hartley's Rolled Plate	2d. ,, ,,
⅝ ,, ,, ,,	2½d. ,, ,,
¾ ,, ,, ,,	2¾d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 8
,, ,, ,, in barrels	,,	0 2 9
,, ,, ,, in drums	,,	0 2 11
Boiled ,, ,, in pipes	,,	0 2 10
,, ,, ,, in barrels	,,	0 2 11
,, ,, ,, in drums	,,	0 3 1
Turpentine, in barrels	,,	0 2 8
,, in drums	,,	0 2 10
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	,,	20 10 0
Best Linseed Oil Putty	per cwt.	0 8 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copla Varnish for outside work	0 16 6
Best Elastic Copa lVarnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

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"Canvass" (You did not make your meaning clear. The model in question came from Piciniśco, near Monte Cassino).

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Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under *100l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*

BROMLEY (Kent).—For alterations and additions to private residence. Mr. G. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C.:—

T. D. Graty* £331

BARNSLEY.—For the supply of slag and whinstone Hoyland, for the Hoyland Nether Urban District Council Mr. W Percy Young, Surveyor, Town Hall, Hoyland near Barnsley:—

2½-in. Whinstone.

	s. d.
Ord & Maddison, Darlington	12 7* per ton

(Delivered Birdwell, Great Central.)

Slag.

	Unbroken. per ton. s. d.	Broken. per ton. s. d.	Screenings per ton. s. d.
Newton, Chambers, & Co., Thorncliffe, near Sheffield (To Hoyland, Silkstone Sidings.)	3 3*	4 6*	4 0*
Newton, Chambers, & Co. (To Elsecar, Midland.)	3 1*	4 4*	3 10*
Newton, Chambers, & Co. (To Elsecar, Great Central.)	3 1	4 4	3 10
Newton, Chambers, & Co. (Wentworth, Midland.)	3 6	4 3	3 9
Newton, Chambers, & Co. (Birdwell, Great Central.)	3 0	4 3	3 9

CANTON (Cardiff).—For enlarging St. John's Church, Canton. Mr. Geo. Eley Halliday, architect, 14, High-street, Cardiff, and at Llandaff. Quantities by Mr. John W. Rodger, 14, High-street, Cardiff:—

Lattey & Co., Ltd.	£2,871 15 2	F. Couzens ..	£2,590 0 0
A. W. Cadwalader	2,770 0 0	C. Beames & Nephew	2,580 0 0
J. Blight	2,705 0 0	W. T. Morgan	2,445 0 0
Couzens & Co.	2,700 0 0	C. C. Dunn ..	2,395 0 0
Shepton & Sons	2,675 3 0	Knox & Wells, Bangor-st.*	2,393 0 0

CHEAM, SUTTON (Surrey).—Block No. 2 of six cottages, including fencing site, paving, drainage, &c., for Messrs. C. T. Brock & Co. Messrs. Barrett & Driver, architects, 53, Blomfield-road, Maida Vale:—

W. Martin, Croydon* £1,120

FARNBOROUGH (Kent).—Rebuilding the Woodman Inn, including pulling down old building, &c., for Messrs. Fox & Sons. Messrs. Barrett & Driver, architects, 53, Blomfield-road, Maida Vale, W.:—

C. E. Bulley	£1,620	Smith & Sons	£1,428
W. Owen	1,560	Wallis & Sons, Maidstone*	1,364
Somerford & Son ..	1,510		

FAWKHAM (Kent).—For the erection of two cottages Mr. G. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C.:—

A. W. Martin	£800	C. S. Lucas	£438
E. R. Thorne	725	R. W. Gilham*	475
S. Jessop	635		

GLOUCESTER.—For the erection of school buildings, Linden-road, for the School Board. Mr. H. Medland, architect, 15, Clarence-street, Gloucester:—

Fincher & Co.	£5,725 0	Colborne	£4,736 17
W. T. Nicholls	5,430 0	W. Jones	4,710 0
King & Sons	4,988 0	Smith & Pitt	4,645 0
T. Gurney	4,977 0	J. T. Williams	4,574 0
Byard & Son	4,930 0	Joseph Gurney, Gloucester‡	4,297 5
Freeman & Jones	4,897 0		
Bowers & Co.	4,797 15		

‡ Accepted, subject to the approval of the Board of Education.

Wood Block Flooring.

	Red Wood.	Maple.
Joseph Gurney	£156 10 0	£219 10 0
J. T. Williams	140 0 0	296 0 0
Smith & Pitt	190 0 0	252 10 0
W. Jones	203 0 0	265 10 0
Colborne	156 15 0	195 10 0
Freeman & Jones	157 13 0	242 3 0
King & Sons	170 0 0	264 0 0
W. T. Nicholls	169 15 5	220 11 0
Fincher & Co.	250 0 0	315 0 0
W. Duffy (accepted for maple) London	164 7 11	*195 12 11
Roger Lowe	156 0 0	203 0 0
Homan & Co.	157 13 0	204 10 6
W. Wibby	188 11 0	228 11 0
Ebner & Co.	207 14 6	244 13
Baylis & Co.	180 2 3	276 19
Geary, Walker, & Co.	156 10 0	338 15
Ashby & Co.	4s. 3d. per yd.	—
Byard & Son	157 0 0	—

HAMBLEDON (Surrey).—For the supply of road materials for the Rural District Council. Mr. G. Lintott, surveyor, Cranleigh:—

	s. d.
Mendip Lime Stone, per Ton.	
Wainwright & Co., Shepton Mallet	9 8
Moonshill Basalt, per Ton.	
Wainwright & Co., Shepton Mallet	12 2
Griff Granite, per Ton.	
Griffiths & Co., Bishopsgate-st. Without	14 0
Leicester Granite (Whitwick).	
Whitwick Granite Co., Leicester	13 10
Leicester Granite (St. Bernard).	
Whitwick Granite Co., Leicester	12 10
Cherbourg Quartzite.	
Road Maintenance Supply Co., Gravesend	13 10
Dug Flints, Unbroken, per Yard.	
F. W. Collins, Hale Farnham	6 8
Dug Portslade Flints, Unbroken, per Yard.	
Wm. Hudson, Brighton	6 4
Farnham Gravel, Coarse.	
Farnham Gravel Co., Farnham	5 11
Farnham Gravel, Fine.	
Farnham Gravel Co., Farnham	5 9
Farnham Gravel, Coarse.	
Ch Paine, Farnham	5 10

[See also next page.

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HARROW.—For two small detached houses to be erected in Pinner View, Harrow, under the supervision of Messrs. Clarke & Charles, architects, Harrow :—

M. Dymock	£1,265	J. Rackham	£1,140
Lee & Co.	1,225	Simmons, Willesden*	1,135

LONDON.—For alterations and repairs to private residence, Sydenham Hill, S.E. Mr. G. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C. :—

Bowyer & Co.	£694 0	J. H. Smith	£623 5
Somerford & Son	674 0	F. J. Moreton*	594 0

LONDON.—Work at St. James' Hall, Nos. 21 and 23, Piccadilly. Mr. Walter Emden, architect, 105 and 106, Strand, W.C. :—

Bywater & Co.	£15,162	Trollope & Co.	£14,555
Howard & Co.	15,000	Hall, Beddall, & Co.	14,470
Spencer Santo	14,985	Roffey	13,990
Holliday & Greenwood	14,777	Lovatt & Co.	13,950
Patman & Fotheringham	14,740	Carmichael	13,862
		A. J. Bateman	11,914

ORPINGTON (Kent).—For alterations and additions to private residence. Mr. G. St. Pierre Harris, architect, 8, Ironmonger-lane, E.C. Quantities by Messrs. Stanger & Son :—

Stebbings & Ponnett	£1,293 10	Somerford & Son	£986 10
Garrett & Sons	1,205 0	R. A. Lowe	974 0
T. Knight	1,038 0	T. D. Gratyt	922 0

† Accepted with modifications.

PENYGRAIG (Glamorganshire).—For rebuilding "Soar" Baptist Chapel, Penygraig, Glam., for the trustees. Messrs. R. S. Griffiths & D. Pugh-Jones, architects, Tonypandy and Cardiff :—

Jenkins & Son, Porth, nr. Pontypridd* £4,800

SHEFFIELD.—For shed over yard at works, Moorestreet, Sheffield, for Messrs. Joseph Pickering & Sons, Limited. Messrs. Hall & Fenton, architects and surveyors, 14, St. James-row. Quantities by architects :—

A. Cooke	£172 5 0	Thos. Astling	£143 5 0
E. Moore	163 8 11	T. Wilkinson & son, Guernsey-road*	138 13 0
G. Allen	160 0 0	H. Boot & Son	135 0 0
C. H. Gillam	159 19 0		
J. Daniels	151 19 8		

[All of Sheffield.]

TENDRING (Essex).—For additions, &c., to workhouse, for the Guardians. Mr. F. Whitmore, architect, 17, Duke-street, Chelmsford :—

Kerridge & Shaw	£4,095 5 3	F. C. Thurman	£3,458 0 0
Saunders & Son	3,945 0 0	Dupont & Co.	3,375 0 0
F. Bennett	3,900 0 0	Jas. McKay	3,331 0 0
E. West	3,808 0 0	W. J. Bloxham	3,272 0 0
Grimwood & Sons	3,692 0 0	E. Saunders	3,218 0 0
H. W. Gledwell	3,599 0 0	Smith & Beaumont, Harwich*	3,208 0 0
A. Suckling	3,478 0 0		

TOTTENHAM.—For the erection of new billiard-room, saloon bar, &c., at the Railway Tavern, White Hart-lane, for Mr. W. Lovery. Mr. Augustine C. Green, architect, 111, Fore-street, Upper Edmonton, and 40, Bruce Castle-road, Tottenham :—

Knight & Son* £2,285

TOTTENHAM.—For the conversion of Nos. 449, 451, and 453, High-road, Tottenham, into houses and shops, for Mr. R. Smith. Mr. Augustine C. Green, architect :—

W. H. Howell	£1,525 0	W. Easun	£1,450 0
J. Groves	1,479 10	W. J. Brysouth	1,240 0
Green & Boxall	1,475 0	W. Moore*	963 10

WADSLEY BRIDGE (Sheffield).—For alterations and additions to the Gate Inn, Wadsley Bridge, near Sheffield, for Messrs. the Directors of Thomas Rawson & Co., Ltd. Messrs. Hall & Fenton, architects and surveyors, 14, St. James-row, Sheffield. Quantities by the architects :—

R. S. Saville	£510 0	G. Allen	£394 10
T. Margerrison	420 0	J. S. Scanby	363 0
Dyson, Son, & Gregory	419 10	G. & C. Earl	358 0
J. Bertram	400 0	W. Ainsley, Whitehouse-lane*	354 10

[All of Sheffield.]

WEALDSTONE.—For six villas to be erected in Gordon-road, Wealdstone, for Mr. W. Ritter, under the supervision of Messrs. Clarke & Charles, architects, Harrow :—

M. Dymock	£2,040	Hastings & Ladley	£1,638
F. W. Wale	1,760	Pickering & Besant	1,535
F. Price	1,758	C. Simmons, Willesden*	1,474
F. & W. Bettesworth	1,725		

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The Builder.

VOL. LXXXII.—No. 3993. MAY 17, 1902.

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Battersea Working-class Houses Competition: No. 2 of the First Premiated Plans ..... Messrs. Smith & Weald, Architects.
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Architecture at the Paris Salon.

ONE cannot but be struck, on each occasion that one visits the architectural exhibition at the Salon, with the curious change that one finds as to the point of view from which architectural design is regarded, as compared with that which prevails in general, and even more than usually this year, in the architectural exhibits at the Royal Academy. With us, the object seems to be the picturesque and even the unexpected in architectural design. With the French, the unexpected is about the last thing that happens; the feeling of the "School" predominates; and whether in the case of a *projet* for a grand palace or a casino for a seaside town, or of a "maison de campagne," we know pretty well, in a general way, what to expect under those titles. The "maison de campagne" indeed affects the picturesque, as that quality is understood by French architects; though it is not our picturesque. In designs for larger buildings, especially those intended for cities, the picturesque is the last thing that is sought for or illustrated; a classic sense of order and symmetry prevails, and the whole is carried out in accordance with recognisable tradition. In the French designs for churches this classic tradition is abrogated in general; church designs differ from those for secular buildings as much as they usually do in England; there is certainly a leaning towards mediævalism in them, but it is not our mediævalism; it shows itself principally in the employment of a manner based on Byzantine types, as the secular buildings show a manner based on Roman types. To the English eye these church designs are deficient in repose and in what we should regard as ecclesiastical feeling. But it is perhaps hardly reasonable to consider French architecture of the day entirely from our point of view, still less to assume necessarily that our point of view is the right one. If the French designs for public buildings appear to us wanting in repose and simplicity compared with ours; if they seem too much marked by what may be called "megalo-mania"; is it not possible that they, on the other hand, may regard our designs for the same class of buildings as deficient in boldness and dignity of character, and wanting in the sense of scholastic treatment? Refinement of taste is certainly to be found in the best English architecture of the day; but there is a certain power and energy about the best French work which seems wanting among us. At all events, one must endeavour to drop the insular position in judging of French design, and to consider it from its own standpoint.

This year, as usual, the Paris show differs from ours in the fact that actual contemporary work is represented only in a very small proportion of the exhibits; too small a proportion, no doubt; it is to be wished that those concerned with the arrangement of this part of the Salon exhibition would make some special effort to encourage the fuller representation of buildings actually carried out or to be carried out. As it is, the largest and most striking drawings are almost always either "projets"—grand schemes which in a practical world would never be carried out; or restorations of ancient buildings; or illustrative drawings of old work as existing. But there is something fine about the motive which underlies all this; these great sets of "restauration" drawings which we see every year, far surpassing in scale and perfect execution anything that we ever see in England, are things done in the pursuit of honour and glory rather than for any immediate gain, which indeed cannot accrue from them; they must mean a great expenditure to their producers. In the long run they may benefit the artist, since the French government is not, like ours, blind to these things; and an architect who has shown his knowledge and industry by producing a fine piece of work of this kind is not forgotten, and is pretty sure of a Government commission when an opportunity arrives. Nevertheless, both these and the immense "projets" for possible (or impossible) edifices, are evidences of a spirit of artistic ambition which is in itself a fine quality, of which there is perhaps not quite enough in England.

The honours of the architectural galleries are this year with M. Henri Eustache, pupil of M. Ginain, who has a whole bay to himself for two grand sets of drawings—those of the restoration and actual state of the Via Sacra at Rome, and those illustrating the Byzantine remains at Mistra. His "Via Sacra" includes two immense strainers showing the state of the excavations in connexion with the Via Sacra in 1896, and, on the same scale, the restoration of the buildings adjacent to it on the Forum side, including the Temples of Castor and Pollux and of Julius Cæsar, the Basilica Julia, and the whole architectural scenery of the site as it may have appeared when complete. Besides these general drawings are some very fine restorations, on a large scale, of various details of the temples. The Mistra drawings include numerous water-colour sketches of existing remains, besides plans, large-scale restorations of mosaic and marble inlay, and a series of restored drawings of capitals to half-size scale. The whole makes a show doing the highest credit to the industry and ability of the author.

Among other restorations of the same class, M. Boutron (pupil of MM. Guadet and Paulin) exhibits a set of drawings of the Imperial Palace of Augusta at Treves, in which the whole building is analysed, so to speak, in a magnificently exected perspective section, and in geometrical sections, longitudinal and transverse, in which the whole restored design of the walls, in coloured marbles, is elaborately drawn out and coloured. M. Bruel exhibits a curious and rather fanciful set of drawings of the quarter of ancient Rome to the south-west of the Palatine, "Le Domaine du Culte de Cybèle." It is a rather modern-antique restoration—

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Roman work of a somewhat French type, and among other things he introduces windows, between the buttresses of some of the fortress-like buildings shown, with the heads filled with thick crossed stone bars, forming a kind of square-lined tracery which seems a very doubtful kind of feature. In the corner of the principal perspective drawing is a collection of carefully coloured facsimiles of the stamped bricks found on the site, with a description of the circumstances and site of each discovery. M. Fournier de Saint-Maur exhibits a number of sketches and restoration drawings of the Priory of Saint-Romain-le-Puy-en-Forez; the sketches show a ruined church of the Byzantine type of Southern France, with restoration drawings, and a sheet of beautiful small drawings of capitals from the crypt. M. Brunet, of the Monuments Historiques department, shows a series of comparatively small but very careful drawings of different portions of the choir of Saint-Etienne at Auxerre, specially called "analytical drawings," made with the purpose of illustrating and expounding the constructive system of the church. These drawings are the property of the Commission des Monuments Historiques, and are probably done as documents to record the state and the structure of the building. Among restorations of more modern work, M. Guadet exhibits a restoration of the Salle de Spectacle built in the Palais Royal in 1790; a large and brilliantly coloured perspective shows the house as seen from the stage, and the plans are given, together with a list of the documents—old engravings and descriptions—on which the restoration is founded. A more important restoration, shown in a large series of drawings, is that by M. Narjoux of the Royal Château at Marly-le-Roi; an exhibit of considerable interest as a revival of the former aspect of a now deserted royal palace and grounds. He gives the plan of the grounds and surroundings, with an elevation of the old palace, a cubical mass of pilasters and much gilt ornament and figures, and separate elevations of the minor villas or summer-houses which flanked the canal at regular intervals. This was one of the favourite retreats of Louis XIV. before Versailles was brought to what he considered perfection, and M. Narjoux has made an exceedingly interesting series of drawings of it.

For the "projets," no doubt, the competitions of the Ecole des Beaux-Arts are largely responsible, though no statement of the kind appears in the catalogue. This perhaps is not the case however, with two of the most important of these designs this year, those of M. Arfvidson (a pupil of M. Ginain and M. Scellier de Gisors), since they are both put down as the property of the Government ("Appartient à l'Etat"), which may therefore have either given a commission for such designs, or may entertain some idea of carrying them out, or something like them, at some future time. As far as one of them is concerned, the design for "Une Eglise Votive dans un Lieu de Pèlerinage Célèbre," the saving clause "something like it' could alone be employed, for this is an architectural dream practically impossible of fulfilment, nor can we imagine what a government essentially secular, if not anti-religious, in its attitude, could want with a design for such a building. However, it is evident, from the fact of M. Arfvidson's designs having been commissioned or acquired by the Government, that he is regarded as a coming man, and we shall hear of him again. His design for the church in question is somewhat similar to the arrangement of the church at Lourdes; a lower church with three vast cavernous circular entrances in the face of a terrace, and led up to by flights of steps which would have delighted the heart of Le Nôtre, who did an exterior staircase on somewhat the same scale in the grounds of Chantilly. From this level, the upper church is reached by a double inclined plane on each side, as well as by a great flight of steps returned on itself within the inclined plane; these lead up to an immense domed church in a somewhat rococo classic style; but the whole is on a scale too great to be ever carried out, and is an example of the kind of "megalo-mania" before referred to. M. Arfvidson's other design, "Un Palais pour le Réception des Souverains Étrangers," is both more severe and dignified in style and more reasonable in scale; it is a façade of immense length no doubt, but not probably so long as the river front of the Louvre, and it is a thing that it would be quite possible to carry out by a Government bent upon making a grand show for foreign sovereigns, regardless of expense; though it would be a kind of scheme, certainly, more becoming the days of the Grand Monarque than of the Republic. The façade, broken into a long centre and two recessed wings, shows a severely treated ground story with square-headed windows, connected architecturally with the square windows of a mezzanine above, and an order and attic above this; the whole architectural ordinance is carried on, with little break or alteration, over the wings as well as the centre, which is a little monotonous though dignified. Below the level of the palace is a riverside terrace backed by an architecturally treated wall divided up by powerfully rusticated piers with sculptured lions. The whole is certainly a grand conception, and if its architect never has the chance of carrying it out, there is no doubt we shall hear of him sooner or later with a large Government commission of some kind: his name is new to us so far. We should not quit the subject without mention of M. Barthélemy's fine design of the same class, "Un Palais pour le Reception d'un Souverain," which, though less stately and ambitious than the one just mentioned, is more picturesque and interesting in architectural treatment, and has the additional merit of an exceedingly fine plan.

Among the other "projets" worth mention is that of M. Léon Jaussely for "Une Place du Peuple," a kind of extension of the Place de la Bastille, which he proposes to lay out as a popular repetition apparently of the Place de la Concorde, with the Colonne de Juillet as the centre object at its upper end. By way of showing the suitability of the position, he gives a block plan of Paris showing the aristocratic quarter and the quarters of labour and commerce ("quartier des ventes"), showing his "Place du Peuple" situated in the centre of these latter. A popular theatre occupies the centre of one side of the Place, with a popular library on the opposite side, so that recreation and study are both provided for, but his Place would certainly want a central object—a fountain or something of the kind; it is too large for a bare expanse. Otherwise the scheme is a fine one and might really be a great public improvement. M. Hubaine exhibits also a scheme for a "Théâtre Populaire," but this, like M. Arfvidson's pilgrimage church, belongs rather to the category of palaces in the air—a kind of thing that it would be practically impossible to find the money for. The plan is, however, a very fine conception; the circle of the auditorium is surrounded by a great circular arcade on the ground story, with a broad promenade between the two; the colonnade opens on another terrace reached by radiating flights of steps. The large sketch elevation shows a free classic treatment in the style of the "Ecole," and rather too ragged with sculptured adornments of a florid character. The whole plan, however, represents an idea which might very well be carried out on a more restricted and manageable scale.

Coming from the "projets" to more practical architecture, we find the centre of one of the angle pavilions occupied by an immense model of the Palais de Fervaques at Saint-Quentin, a town which, from other indications in the exhibition, appears to be in a very ambitious and advancing stage. What the "Palais de Fervaques" is we do not gather; the model suggests the idea of a large municipal building; it is a fine dignified classic design on a plan of the general shape of H, very reticent in detail (in which respect it compares satisfactorily with some other classic designs in the exhibition); two stories of rusticated work with square-headed windows, and an order above, treated as columns on the principal front to the courtyard, and as pilasters over the remainder of the building. A whole set of sections and plans, and an immense detail elevation of one bay, hung in the same pavilion, further illustrate this building, but the plans are too high to be well seen. The architect is M. Malgras-Delmas, who also exhibits a design for a monumental fountain for Saint-Quentin, a bold classic design apparently intended for execution in terra-cotta. Then there is M. Santerre's scheme for the enlargement of the Bourse at Lille, which is of some interest. The present Bourse, shown in a sepia sketch, is a rather florid late Renaissance building (1651), with an arcaded ground story, an order of rusticated pilasters over that, and an order of plain pilasters with much garlanding and festooning in the upper story; a small lantern breaks the roof line in the centre. M. Santerre proposes to double this façade, inserting a large entrance-portal and a lofty tower between the new and old halves of the building, the present lantern (repeated on the new portion) becoming now a subordinate instead of a central feature. This is a bold and effective treatment of the problem, but the new tower is rather too lofty and too restless in outline; a small alternative sketch, of a less ambitious character, is preferable to the large drawing. It is rather surprising that while the architect was about it, he should not have thought of giving the façade an adequate crowning member, for it is one of the peculiarities of the existing building that the eaves of the roof come right down on the top of the upper story order, with nothing in the shape of a cornice or entablature; perhaps this treatment was thought too characteristic

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to be effaced, but it will look odd on the new portion of the structure.

Among other schemes for public improvements M. Meissonnier exhibits a plan and section—the latter beautifully and minutely showing all the buildings concerned — for laying out a portion of Marseilles; and M. Picq a plan for a "Palais Royal Nouveau," a scheme of some interest. He proposes to build on the existing parterres of the Place du Palais Royal a long building comprising two theatres back to back, with a common entrance hall between them; the block of building being flanked by a double line of trees on each side. What are the prospects of such a scheme being carried out we know not, but it promises well in itself. M. Vinson exhibits a design for the transformation of the former Hôtel de Ville of Saint-Quentin into a municipal library, adding a block to it in the same style of florid Gothic as the original building; the ground floor forming the police quarters, the upper floor the new library. This confirms the idea that the Palais de Fervaques, shown in the model before referred to, is really the new Hôtel de Ville. Passing over some other designs for public or municipal buildings of no great account, one must not however omit mention of a beautiful design for a theatre by M. Bertaud (in collaboration with M. Louis Dupuis); it is not stated where, but this is a practical design of moderate dimensions, built with plain walling of alternate brick and stone bands, crowned with a kind of attic (but no cornice intervening) formed by colonnettes and panelling alternating; the whole very simple but original and in excellent taste; the plan is as meritorious as the exterior treatment. The drawings are on a very small scale (an unusual thing in the Salon), and might easily be overlooked, but it is one of the best things to be seen in the galleries.

There are a good many designs for churches, for a considerable proportion of which a recent competition for a church at Flers appears to be accountable. It is curious to compare the idea of church architecture symbolised in these, with our own prevalent taste in the same branch of architecture. There is hardly such a thing as a simple and unpretending treatment of a church to be seen; indeed one architect shows a design for a "Church for a Village" which, as far as scale is concerned, might be a cathedral, and as far as style, a casino, except for the spire. But there are more sober designs of considerable interest, and which are worth attention, in order to realise what are our neighbours' ideas of church architecture. As before indicated, the favourite style seems to be what may be called a modernised variety of Byzantine or of Romanesque. This is the character of M. Just Lisch's competition design for the Flers church; a powerful design with a great arch in the west front framing a wheel-window within it; a basilica type of nave, but with small transepts added; the cupolas or lanterns of the towers which flank the west front are, however, certainly too high in proportion for the substructure. This is better, however, than the cast-iron Gothic of M. Maistrasse's design in the same competition. M. Robert shows an original design of what appears to be an actually erected church; the style is a mixture of Classic and Gothic in feeling, with a rather low-pitched dome over the crossing, pierced with coffer lights; the effect of the whole is however rather spoiled by the immense lantern, or rather spire, springing from the centre of the dome, and which somewhat reminds one of Wren's ill-advised first design for St. Paul's, though not quite so portentous. M. Jardel's competition design for the church of Domfront has the interest (which many of the others have not) of being the design selected for execution, and is in a style more simple and more mediæval than most of the others; it may be described as Early French pointed, slightly modernised. The west end shows a fine and effective treatment, with a colossal crucifix over the portal. Another church design worth a note is that by M. Bertaud (locality not stated), where a very massive stone tower with immense buttresses forms the seat for a timber spire of a somewhat châlet character, with a repetition of large projecting eaves between which the bells are partly seen; it is an odd-looking affair, but there is something in it, and it would possibly look better in execution than in the drawings, which are rather sensational in style and colouring. An important design, as might be expected from the high repute of its author, is that by M. Guadet for an "Église Paroissiale." This is a design of the "modern Byzantine" type, but more severe and thoughtful than usual; the treatment of the crossing piers, which develop into great quarter-engaged circular columns perfectly plain except for some panelling at the top, is massive and grand in effect. The roofs are covered with semicircular barrel vaults which, from the indications and colouring seen in elevation, have the appearance of being formed of brick arches one over the other, somewhat after the manner of those in the Pantheon dome, and filled in with some lighter substance; but the section does not leave it quite certain that this apparently solid method of construction is anything more than an appearance. However, this is a design of more than ordinary interest.

In domestic architecture we find, as usual, some of those examples of country houses which seem always to be the same; collections of gables and spikes and gimcrack wookwork, which represent a form of "picturesque" architecture with which English architects can have little sympathy. In fact, the French genius is not for the picturesque, and while French architects are generally admirable in the design of town houses, they seem to lose the sense of refinement and architectural propriety when they take to designing country villas. But in the category of domestic architecture there are one or two fine things at the Salon. We may especially mention M. Guinot's "Hôtel, 22 Rue Hamelin." This is quite different from the usual perhaps rather too florid type of Parisian private house. The front is a mass of plain symmetrically coursed stonework, in the lower portion of which are some doors and windows just cut out of the wall of masonry, with very little decorative detail. Above these, the centre portion of the face is occupied by the large window of the principal salon, with pilasters and transoms richly decorated, the whole in what may be called a reminiscence of Francis I. style; the rich ornamentation of this window contrasting effectively with the stern plainness of the mass of walling in which it is placed. The drawings, which in the sections show the interior decoration and woodwork with the greatest minuteness of finish, are splendidly executed. M. Sardou's "Hôtel pour la Société des Auteurs Compositeurs Dramatiques" is a finely treated building in somewhat the same spirit; a plain stone ground story, crowned by a richly-carved frieze, from which spring pilasters and windows also recalling the Francois Premier style, the whole having the character of a sober richness of effect. The interior staircase hall is also finely treated. Among the country houses M. Sauvestre's "Villa sur le Lac Leman," though partaking too much of the usual rampant picturesque manner before referred to, is a rather exceptional work; one half of the house projects over the lake, this portion being carried on bold semicircular stone arches springing from piers in the water; the ground story behind these consists of three embayments or small docks for pleasure boats; the habitable portion being on the upper floors and carried partly out over the lake. This is a fine set of drawings, and allowing for points in it which are at variance with English architectural taste, it is a remarkable and unusual design for a house. M. Ollivier's country mansion, with the exotic title "Kestellic," is a solid stone house in a most romantic site (judging from the perspective view which shows the landscape also); a design with a certain Gothic feeling, heavy in the details, but on the whole a welcome contrast to the usual "maison de campagne" style. We noticed with pleasure also M. Camut's designs for certain small waterside club-houses and casinos for the "Cercle du Bois de Boulogne"; these are picturesque without being fidgety and angular, and the plans are very well arranged both for interior effect (in the large rooms) and for general convenience.

As for sketches illustrative of existing old work (not restorations), they form, in mere numbers, a very large proportion of the exhibition, perhaps one-half, though many of them are small and slight. The best of the slighter sketches in pencil and water-colour are hardly equal in style and feeling to the best work of the kind produced by English sketching architects. There are, however, some examples of illustrative work of a more highly finished description, which in beauty and elaboration are quite beyond what we are accustomed to here. Pre-eminent among these is M. Moisand's splendid coloured elevation and plan, on a very large scale, of the monument to Giovanni XXIII., in the Baptistery at Florence; a drawing in which all the details are made out with such realistic force and accuracy that it is almost like seeing the thing itself. Whether this kind of achievement is worth the pains and talent expended on it may, of course, be a question; but it serves to show what architectural drawing can effect, and to set a high standard in this class of illustrative work.

The architectural exhibits in the New Salon are too few and unimportant to call for comment.

THE MONUMENT TO VICTOR EMMANUEL II. IN ROME.

THE colossal structure which has been in course of erection from the designs of Sacconi for so many past years, is now arriving at a stage when the crowning feature of the equestrian figure of the King will have

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to be put in hand. The design for this statue dates from about fifteen years ago, when the public competition was held, and the commission was given to Enrico Chiaradia, a Venetian sculptor who had the misfortune to die in the prime of manhood only last year. Since his death, the work has been carried on in strict accordance with the original design, which he had practically completed, and which only requires getting into form for the casting in bronze.

The statue is about 33 ft. in height from the level on which the horse stands to the crown of the King's head. The feathers in his helmet are about 5 ft. extra. There will be space for one or two persons to get into the head—and for four or five in the head of the horse. The scale of the figure is about that of the Bavaria statue at Munich.

Works of art on a colossal scale are always difficult to criticise—a gigantic human figure, however executed, has an overpowering effect on the mind; it is necessarily too unusual to allow of comparisons of an ordinary kind. And as a consequence some persons find an Egyptian colossus, and still more a modern example of such art, very uninteresting. The æsthetic quality in such sculpture may usually be reckoned in inverse ratio as the scale increases, and also its human interest. An effort at being imposing and grand by mere size hardly needs definition as sheer vulgarity when applied to works of art, and in the case of modern statues the colossal hats, coats, trousers, and trimmings have a particularly ridiculous appearance, like ordinary humanity seen through a magnifying glass.

In the present case the statue of the "Re Galantuomo" does not appear to be superior to the ordinary type of such usually unsuccessful efforts. The portraiture of the King may be good, but something more is required in such a style of monument than a mere portrait, and this unfortunately seems wanting. This statue may be, perhaps—and it is to be hoped it will be—considered as the final attempt of the Italian sculptors in the "colossal style." Italy has been disfigured since the revolution of 1870 with several of the most atrocious things of the kind, doubtless sufficiently representative of the modern "realistic" taste in art, and proportionately unsatisfactory. The centres of Florence and Milan are both "decorated" with their provincial "Victor Emanuels," and it would be difficult to say which is the greatest blot. Now Rome is to share the same fate; but although its "Victor" is not much better than its provincial rivals', its superior dimensions will at least create that sort of overpowering impression to which reference has already been made; it will successfully "stupefy the beholder."

Italians have always had a taste for these colossal figures. In the ages of faith S. Carlo Borromeo of Milan was honoured with a statue on the shores of Lago Maggiore, 70 ft. in height, erected in 1697, part bronze and part copper. It is a clumsy, ugly creation, and but for a certain weathering down and antique look, would be a very serious annoyance in the landscape. Florence has many of these strange *tours de force*, the only one of which claiming more than a very superficial glance is Michelangelo's David. The seventeenth century was prolific in such things, but the development of this taste in the last years of the nineteenth century has been much more remarkable. Many statues of this kind have been executed in marble and bronze for home consumption and for America. A portrait statue of one of the Vanderbilts as a River God many yards high was commissioned in Florence for some American town fifteen years ago—a sample of the American taste in such things which culminates in the lighthouse of New York.

The statue of Victor Emmanuel, to be erected on the Capitoline Hill, has at least one superiority over the majority of such things which have been designed during the past quarter century; it is fairly quiet in pose, and free from the absurd exaggeration of movement and attitudinising action which is supposed to give "life" and "brio" to the common productions of modern Italian art. This merit was not present in the original design of Chiaradia, which, on the contrary, represented the King reining in an impetuous charger with strained muscles and a realism of effect which constitutes the whole stock-in-trade of mere initiative sculpture. Since the first project for the statue, a change in public opinion has fortunately taken place, and although the figures of horse and rider are treated in the amended model as the merest dull transcripts from nature, with all the details of a particularly ugly modern cavalry uniform and trappings reproduced as if cast from gigantic originals, still a certain quiet dignity of an unambitious kind has been brought about by modifications insisted upon by the members of the Government committee for the statue. As in all equestrian statues of the kind, contending opinions centred in the attitude of the horse. In the original design the horse represented as being suddenly checked in its paces with outstretched foreleg had a disagreeable uneasy effect, however "natural" it may have been. In the finished statue this attitude of the horse has been changed for the pacing of Donatello's "Gattamelata" at Padua, with infinite advantage to the group. But the modern statue lacks all the verve and power of the ancient example. The horse is, of course, anatomically more correct, but the fifteenth century animal has a certain look of "anima" about it which goes far to make up for deficient anatomy.

The position chosen for the statue is very unfortunate. Just round the corner, or almost at the back of the immense monument of Italian independence of which it is to form the central feature, and in the ancient piazza of the Capitol, is the venerable equestrian statue of Marcus Aurelius. These two equestrian statues placed in such close juxtaposition, representing such widely different periods and characteristics, and being in themselves extraordinarily unlike, cannot fail to excite a great deal of comparative criticism. The statue of the great Emperor is not a very beautiful or ideal sample of ancient art, although in some respects it may compare favourably with its more imposing modern rival. At the same time the "naturalesque" treatment of the king and his charger will cause the old Roman work to have a certain grotesqueness in the eyes of an uneducated public. The artist of æsthetic taste will, however, naturally prefer the more ancient of the two.

The preparations for placing the statue and laying bare the immense structural base fronting the old Piazza Venezia and the Corso are approaching completion. The Palazzo of the great banker Torlonia has at last been pulled down, and the piazza will soon be reduced to its eventual form. The model (in thirty-six pieces), which has cost about 20,000 fr., is shortly to be removed from the old theatre of the Mausoleum of Augustus, where it has been constructed, to the site which the bronze casting is to occupy, and there it will be erected for public approval. It will be painted a bronze colour, or gilded to give the nearest effect to the original. The cost of the eventual casting and completion of the statue is estimated at about 600,000 fr. (24,000*l.*).

NOTES.

Workmen's Compensation.

THE decision of the House of Lords on a point of workmen's compensation law in the case of Wrigley *v.* Whittaker (the *Times*, April 30), although of considerable importance, requires to be read with a little caution. In this case a workman in the employ of an engineering firm was killed whilst engaged in fitting a flywheel to some machinery in a cotton-spinning factory. His representatives claimed under the Workmen's Compensation Act against both his employers and the owners of the cotton factory, basing their claim on various grounds; but the appeal to the House of Lords was only on the case against the man's employers, and in the judgment, as at present reported, the claim was disallowed, on the simple ground that to render an employer liable the factory must be that of which he is the "occupier," so as to render him an "undertaker" within the Act. It requires to be borne in mind that, although in such factories as the above the word "occupier" is used in its ordinary sense, denoting the person carrying on the business of the factory, yet certain artificial factories, so to speak, are created by the Workmen's Compensation Act, of which the "actual use" even for a temporary purpose is sufficient to render the person so using it the occupier or undertaker. This is the case when machinery driven by steam, water, or other mechanical power is used in the construction, repair, or demolition of buildings, and also applies to docks, wharves, quays, and warehouses to which certain provisions of the Factory Acts have application. What is sufficient to give the "actual use" of such premises, apart from the temporary use of machinery, has never been decided, except in relation to ships; but in one of these cases the Court of Appeal intimated it must be the use of a sufficiently definable area, and the space occupied by a cart on a quay, or near a warehouse, would not be sufficient.

Tube Railways.

THE decision arrived at on the 7th inst. by Lord Windsor's Select Committee of the House of Lords, in conjunction with Lord Ribblesdale's Committee and the Chairman of Committees, in reference to the "tube" railways in London is one of the greatest importance both to the promoters of these schemes and to owners of property in the Metropolis. It has been decided in reference to these undertakings that a general clause should be inserted—apart from special clauses dealing with particular buildings—fixing some such period as two years within which all questions of damage arising either out of

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the construction or the working of these lines can be referred to some special tribunal or arbitrator. To appreciate the importance of this decision, it must be borne in mind that in the absence of such a clause, where lands or buildings are affected by the working of the undertakings, as distinguished from the construction, no compensation can be recovered for damage arising, as, for instance, from vibration (see Hammersmith and City Railway Co. *v.* Brand), unless the property injuriously affected and the property taken by the undertaking are held by the same owner (see The Duke of Buccleuch *v.* Metropolitan Board of Works). Such an extension of liability in the case of "tube" railways running under a huge city seems in every way desirable, and its effect will be to make the promoters of such undertakings use their utmost endeavours to minimise any damage likely to ensue by providing the best means to overcome vibration.

Specific Performance of Contract.

THE case of "Van Praagh *v.* Everidge" (*Times*, May 12) raises an interesting question in curious circumstances. Some auctioneers were selling three different freehold properties—one at Hampstead, one at Ashstead, and one in the City. The defendant, a builder, who wished to acquire the Ashford property with a view to developing it, attended the sale, but accidentally bought the Hampstead property, which belonged to the plaintiff. He immediately discovered his mistake, and refused to sign the contract, but the auctioneers signed for him, and the plaintiff now brought this action. There had been no negligence on the part of the auctioneers, and the defendant had acted quite bonâ fide. The learned Judge held there was a contract, and the substantial question was whether in such circumstances there should be a decree for specific performance, or only judgment for damages. The Court granted a decree, holding where the mistake is solely that of the defendant himself the Court will only refuse specific performance when some hardship amounting to injustice will ensue.

The Thames as a Highway.

IN view of the miserably congested state of the traffic in so many of our principal thoroughfares, the letter from the Managing Director of the Thames Steamboat Co., published this week, affords food for reflection, even if it does not call for a serious inquiry. The Thames affords a splendid and unimpeded means of communication between points where the streets are the narrowest and the traffic the most heavy, yet we are informed the public are to be denied this pleasant, speedy, and economical means of locomotion on account of the attitude adopted by the London County Council. The Council was alleged to be desirous of undertaking this service themselves, but it was recently stated in the Press they would not be in a position to do so before the year 1904. Apart from the present dispute between the County Council and the Steamboat Co., this raises the question whether it is desirable that municipal corporations should have powers granted them enabling them to run commercial undertakings out of the rates in competition with private enterprises. The House of Lords recently decided in relation to the omnibus service that they at present possessed no such powers, and we do not think it is expedient such powers should be granted to them. It has been the policy of this country never to interfere with private enterprise by allowing state competition, and municipal competition is much the same in its influence. Where the rates can be called on to supply any deficiencies, the ordinary considerations of profit and loss have no application, private enterprise is discouraged, and the rate of wages is often seriously interfered with.

Accommodation at the Law Courts.

A QUESTION was asked of the Attorney-General last week in the House of Commons as to whether the accommodation at the Law Courts for the Judges was so insufficient that one Judge was holding his court in what is known as the Old Library at Lincoln's Inn, and another in a room under the Bar Library at the Royal Courts of Justice. The Attorney-General admitted the fact, but he seemed to suggest that the remedy lay, not in building another court, but in rearranging circuits of the judges in the provinces, so as to admit of the present courts in the Strand being sufficient. It seems to be clear, however, that one other court, at any rate, ought to be built. There is no place for another division of the Court of Appeal, should one be constituted, and it is also to be borne in mind that a court, if vacant, can always be let for the purposes of arbitrations—in fact, what we may call an arbitration court—it could also be used for the purpose of examining witnesses before an examiner, and would be a very useful addition. Any such new court or courts ought certainly to be erected on the north side of Carey-street in place of the ramshackle structures which are now occupied as a public-house, stationer's shop, &c. It would be very undesirable to take away any of the open space to the west of the Law Courts, which is extremely valuable as a lung of London.

A Case of Underpinning.

A HEAVY and difficult underpinning operation has recently been carried out in Lower Broadway, New York, where one end of a building having seven stories above the street and two basement stories below was supported, first in a temporary way, and finally on new footings. The wall in question is of the load-supporting type, 100 ft. long and 32 in. thick at the base, which is offset to a thickness of 5 ft., and rests upon a concrete footing 5 ft. wide by 3 ft. thick. Owing to the erection of a new and higher building adjoining, it was calculated that a settlement of about 2½ in. would occur in the fine sand forming the soil. Provision was therefore made to underpin the older building with new footings carried down 5 ft. lower, so as to be even with the footings of the new structure, and to hold up the building in order to keep it from injury while its footings settled with those of the new building, and, finally, when all movement had ceased, to build new brickwork between the new footings and the old wall. Operations were commenced by building timber cribs on both sides of the old wall, the cribs being connected by timber stringers parallel with the wall, and several feet from it to afford ample working space. Pairs of steel girders with a combined depth of 30 in. were placed at intervals of 4 ft. across the stringers with screw-jacks under their ends. The wall being thus supported, the new footing was formed and built up to within about 3 ft. of the old wall. When the cement had set, screw-jacks were arranged as closely together as possible and in two rows to take the load in place of the steel girders, which were then removed. For the purpose of measuring settlement, a bench mark was established on an inner wall of the building at some distance from the underpinned wall; and level marks thereon were examined daily by means of a levelling instrument. As the underpinning settled with the new building, the jacks were screwed up at the rate of about ⅛ in. a week to correspond with the movement, and thus the upper portion of the old building was kept stationary. The wall has been supported for seven months on 360 jacks, and now that all movement has ceased brickwork is to be built up between the new footings and the old wall. It appears that the work has, so far, been entirely successful. No cracks have been caused in the plaster; there is no indication of any damage to the masonry; and the alignment of lifts and other machinery has not been disturbed.

The Design of Wood Beams.

CONSIDERING the abnormal use that will be made of timber in the Metropolis during the present year, a paper published in the present issue of the "Journal of the British Institute of Certified Carpenters" is particularly *apropos*. In dealing with the properties and design of wood beams, the author concerns himself chiefly with an explanation of the principles governing the strength of all rectangular beams. This being the case, no new matter is to be anticipated, and the usefulness of the paper is to be found in the collection and simple explanation of truths which ought to be familiar to all who may be called upon to employ timber beams for permanent or temporary structures. We do not think the unqualified recommendation of five as the factor of safety is altogether wise, for very much depends upon the conditions under which timber is to be employed. Having regard to the perishable nature of the material, a factor of ten is desirable when exposure to the weather is contemplated, and for permanent structures under cover it would be safer to use a higher factor than that suggested by the author. In the case of temporary erections, the factor may be five, or even less, but it is always desirable to be on the safe side when employing material of variable character. The adoption of an ample factor is further necessary if the transverse strength of timber is taken from tables based upon experiments made with small test pieces, which invariably give higher values than are afforded by actual beams.

Gas Consumption during the Hours of Daylight.

AN interesting paper on "The Illuminating Power of the Gas of the Future" was read last week by Mr. H. E. Jones at the meeting of the Institution of Gas Engineers. Mr. Jones is Engineer to the Commercial Gas Co., of London, and is connected with a number of gasworks situated outside the Metropolitan area. He advocates the supply of a lower-grade gas at a price so much lower than that at present charged that the use of gas for

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power and fuel purposes must become almost universal. We have on previous occasions, when commenting on the Lewes method of gas manufacture, mentioned that non-luminous water-gas, which costs less than 4d. per 1,000 cubic feet to manufacture, as compared with 1s. or more for coal-gas, may with great advantage be used in conjunction with coal-gas for general supply, provided that the reduction in price be fully commensurate with the reduction in the heating value of the gas, and a satisfactory calorific standard be fixed by Act of Parliament. That the use of gas for purposes other than lighting is rapidly increasing, even under the existing high charges, is shown by the output from the Commercial Gasworks during the year ending March 5, 1901. The average increase in the output for the year was 15·7 per cent. between the hours of 6 a.m. and 6 p.m., whereas the increase was less than 3 per cent. between the hours of 6 p.m. and 6 a.m. Opinions may differ as to the best method of producing the low-grade gas, but given proper protection with regard to the price, heating power, and pressure of the gas supply, that is not a matter that need trouble the consumer. The efforts of Mr. Jones, Mr. Livesey, and other leading gas engineers to supply cheaper gas on the lines indicated should, we consider, with the precautions mentioned, receive public support.

Lancaster Rural District.

DR. ST. GEORGE MIVART'S report to the Local Government Board on the general sanitary circumstances and administration of the Lancaster Rural District states that while there is not, generally speaking, any grave fault to be found with the housing, and the cleanliness of cottage interiors is especially noteworthy, the water supply generally throughout the populous portions of the Rural District of Lancaster must be regarded as highly unsatisfactory. Over a very considerable area inhabitants are almost exclusively dependent for drinking purposes upon such rainwater as they are able to store. "At the time of my visit a drought of very exceptional severity prevailed, and the greatest possible hardship was in many cases being experienced—hardship which would have been entirely obviated had measures been taken in the past to lay on to certain townships a supply of water from the mains of public services not far distant. Although inhabitants generally were mute on the subject of the hardships they have to endure from want of water, it was easy, where any sort of questioning was permitted, to establish the fact that, even in normal summers, the greatest difficulty is experienced in obtaining a supply of water which is, even locally, regarded as wholesome." The Report goes on to state that the sewerage system of the district is in an exceedingly defective state; that the wells and dipping-places for water are all liable to pollution, none of the wells being otherwise than dry-steined; and that excrement disposal is by means of cesspit privies, for the periodical emptying of which no regular or adequate provision is made. It is to be hoped that the appearance of such a report will goad the official authorities into doing something to set about remedying this insanitary and discreditable state of things in their district.

Queen's College, Birmingham.

A SCHEME has been laid before the Charity Commissioners for the reconstruction and reorganisation of Queen's College. It is proposed to expend a sum of 20,000*l.* in rebuilding the front portion with a block containing shops on the ground floor, offices and men's rooms above, and a meeting-hall in the rear. The residential accommodation will provide for a warden, a sub-warden or dean, and twenty-nine students. The college was established in 1828 by the exertions of William Sands Cox, F.R.S., mainly for the study of medicine and surgery, with theological, classical, and scientifical departments, and received royal charters of incorporation in 1843 and 1847, the Council being empowered to grant certificates for various degrees in the Arts to be conferred by the University of London. The medical and art departments have since been transferred to Mason College (opened in 1880). The Rev. Dr. S. W. Warneford's gifts amount altogether to an endowment of 5,000*l.* The foundation-stone of the then new buildings was laid on August 18, 1843, and in the following year the St. James's Chapel, appertaining to the college, was completed. In the altar-piece is some work in silver, "The Shield of Faith," executed by the late E. Thomason after a design by Flaxman, and in the dinner-hall are three examples of David, the French painter.

THE ARCHITECTURAL ASSOCIATION.

THE last ordinary fortnightly meeting of the Architectural Association for the present Session was held on Friday evening last week in the Meeting-room of the Royal Institute of British Architects, No. 9, Conduit-street, Regent-street, W., the President, Mr. W. H. Seth-Smith occupying the chair.

The minutes having been read and confirmed, and three nominations having been read, the following gentlemen were elected members, *i.e.*, Messrs. H. H. Fraser, W. Guthrie, G. S. Mileham, and J. E. Mundell.

Mr. H. P. G. Maule, Hon. Secretary, announced that the first summer visit would take place on May 24 to Christ Hospital, Horsham.

Mr. Maule also proposed a vote of thanks to the London County Council for kindly allowing a party of members to visit, on the 26th ult., Perry Vale Fire-station, and to Mr. Owen Fleming for conducting the party on the occasion. Also to Mr. Harrison Townsend for arranging the visit to Horniman Museum on the same date.

New Premises Fund.

The motion having been agreed to,

The Chairman announced that the following donations had been made to the New Premises Fund: Messrs. G. T. Hine, 50*l.*; Max Clarke, 15*l.* 15s.; C. Gilbertson, 5*l.* 5s.; Alexander Wood, 5*l.* 5s.; J. S. Blunt, 3*l.* 3s.; A. W. Turnbull, 2*l.* 2s.; Horace Field, 2*l.* 2s.; T. Bee, 1*l.* 1s.; E. Carless, 1*l.* 1s.; Walter Hearn, 1*l.* 1s.; E. Hemingway, 1*l.* 1s.; G. W. Jones, 1*l.* 1s.; and W. M. How, 1*l.* The total of the fund is now 4,206*l.* 11s. 6d.

Mr. R. S. Balfour, hon. secretary, announced that a meeting of the Camera Club would be held on the 21st inst. at No. 56, Great Marlborough-street, when there would be an exhibition of photographs, apparatus, &c. Several prominent firms had consented to exhibit, and the exhibition was likely to be a very successful one.

Mr. Balfour also announced the donation to the library of Mr. Mowbray A. Green's book on "The Eighteenth Century Architecture of Bath," and on his motion a vote of thanks was accorded to the donor.

Election of Officers.

The Chairman read the report of the scrutineers appointed to deal with the voting papers received in connexion with the election of officers for session 1902-3. It stated that 317 voting papers had been received and that nine had been rejected as invalid. The following is the result of the election:—

President.—Mr. Henry T. Hare.

Vice-Presidents.—Messrs. W. A. Pite and L. Ambler.

Committee.—Messrs. W. Howard Seth-Smith; G. H. Fellowes-Prynne; Arnold Mitchell; F. D. Clapham; G. B. Carvill; W. H. Raffles; E. Guy Dawber; R. H. Weymouth; John Murray; Hon. A. McGarel Hogg.

Hon. Treasurer.—Mr. Francis Hooper.

Hon. Librarian.—Mr. J. MacLaren Ross.

Hon. Secretaries.—Messrs. R. S. Balfour and H. P. G. Maule.

Votes of Thanks.

On the motion of the Chairman, a vote of thanks was accorded to the scrutineers, Messrs. H. G. Collins, E. W. M. Wonnacott, and G. H. Smith.

Mr. F. G. F. Hooper said he desired to propose, in no formal way, a very hearty vote of thanks to the President for the way in which he had acted in that capacity during the past two years. Their President had given up his time and energy to the work of the Association in a most unselfish way, and he could stand shoulder to shoulder with the most enterprising and enthusiastic of any president they had had. Mr. Seth-Smith had put his hand to two very important undertakings—one, the Day-school, had been actually launched, and the other, the New Premises scheme, was making slow, but, he hoped, steady progress. They had had very gratifying reports of the Day school, and he understood that the men who had joined the classes had not only expressed their satisfaction, but they had satisfied the headmaster, Mr. Bolton, and his assistant, by the amount of enthusiasm they had shown in their work. The New Premises scheme had been talked about a great deal, but Mr. Seth-Smith had grappled with it so enthusiastically because the lease in Great Marlborough-street was rapidly drawing to a close, and the work of the Association, particularly in some classes, had quite outgrown the premises now occupied. He felt sure the vote of thanks would be carried with unanimity.

The vote of thanks having been very heartily agreed to,

The Chairman, in reply, said the Association was inspired by a very lofty ambition; nothing less than that London should be a city of beauty, and that the design of no building in it which was in bad taste could be attributed to any past student of the Association. He did not think they could describe that as a transcendental idea; it was certainly powerful enough to induce most of the best architects in London to devote time and means to its attainment. That idea might seem foolish, almost suicidal, regarded from the standpoint purely of the utilitarian side of work; but those who really had this great aim at heart, those who had this enthusiasm, cared more for this aim than for any financial benefit which they might get out of architectural work; it was their delight to help on work of the kind the Association is doing. If not, why should Royal Academicians and other eminent architects lead the Association Classes of Design, and they, and others of no less talent, and as busy, give their time and experience, which had cost so much, on Committees and in other ways? He did not know that there was any other society of artists which could show such a record of devotion to the education of their future competitors. If he had caught the infection of enthusiasm, and had followed the example of so many abler than himself, no special credit was due to him for drinking deeply of the joy which such work brought with it. He desired to record his heartfelt thanks to his colleagues of both years for their support, to the Vice-Chairmen and honorary secretaries very especially, and last, but not least, to their exemplary and indefatigable secretary, Mr. Driver, who, by quietly writing to his friends, had obtained 139*l.* for the New Premises Fund. His (the Chairman's) predecessors left him no other course than to do his best for the Association. Two qualifications were necessary to the new President, *i.e.*, he must be an artist and also a capable man of business. That the President of their choice, Mr. Hare, possessed these qualifications was so well known as to leave no tittle of doubt that he would lift the Association a step higher in popularity and usefulness. Neither Mr. Hare nor himself would be satisfied until the Association was better housed.

The Chairman then proposed a vote of

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thanks to the hon. secs., the librarian, the editor of *A. A. Notes* and the assistant editor, the School of Design Visitors, the Education Committee, the Technical Education Board for Workshop Demonstrations, the Royal Institute of British Architects for the use of the Meeting-room, and to Mr. E. W. M. Wonnacott for working the lantern, and to others who had assisted in various ways.

The motion having been agreed to,

The Chairman proposed a vote of thanks to the Press, and this was also agreed to.

Housing of the Working Classes.

Papers were read during the evening on the housing of the working classes. The first paper, "Municipal Housing: its Economic Basis," was by Mr. Owen Fleming, and was as follows :—

It would perhaps be an exaggeration to say that housing is finance and that finance is housing. But the connexion between the two is so intimate and so far-reaching that unless the principles of finance are mastered, talk on housing, especially municipal housing, is almost futile. An excellent illustration of the prevalent confusion of thought occurred at the Paris Exhibition of 1900. At the Vincennes annexe were erected several examples of working-class dwellings, ostensibly representing the tangible outcome of the most recent housing effort in the different countries. Investigation, however, disclosed the fact that these specimen cottages were not designed on any common financial basis, but were either the arbitrary product of the constructor, or the outcome of local and special conditions. Great Britain, for example, was represented by a specimen of the cottages erected at Port Sunlight by Messrs. Lever Brothers. This cottage, however, was not the result of normal financial conditions, but really represented the generosity of a distinguished firm of British manufacturers. On March 21, 1902, Mr. W. H. Lever informed this Association of the actual financial basis upon which Port Sunlight has been constructed.* "The financial aspect of the village of Port Sunlight is soon told," said Mr. Lever. "The capital it has taken to buy the 140 acres of land, build the cottages, houses, schools, shops, institutions, clubs, &c., and including making the roads, laying out the parks, &c., has been over 350,000*l*. . . . Upon this 350,000*l*., Lever Bros., Ltd., receive no interest or return whatever, the rents being fixed at such an amount as only to pay for rates, taxes, repairs, and maintenance." However highly we may be disposed to value the work that Messrs. Lever Bros. have done, it is clear that municipal action cannot proceed on similar lines. A municipality has to account for its action to vigilant constituents. There is no banking account upon which cheques can be drawn at will. Every pound spent by a municipality on housing has to come from somewhere. The work has, in fact, to be administered on strictly commercial principles. The capital has to be borrowed and redeemed, and unless due provision is made for the consequent interest and sinking fund, comparisons of the results achieved are of very little value.

It is clear, therefore, that in considering any housing experiments, the first point to be examined is the soundness of the financial basis, and in this investigation it is necessary to be somewhat exacting. Many apparently promising building schemes break down when submitted to this financial examination, and it has therefore seemed better to utilise the present opportunity for a description of the actual financial circumstances under which municipal housing work has to be carried on, rather than for a comparative analysis of the resulting architectural achievements. After the economic basis has been fully grasped, the architectural questions remaining will present no insuperable difficulty to experienced architects. Indeed, the plan and general structure of housing buildings are but the tangible and visible outcome of the intangible but governing circumstances.

The nature of the powers conferred on British municipalities by the Housing Act of 1890 is very extensive. Under this Act they are empowered to acquire and to demolish whole districts of insanitary property, and to sell or otherwise utilise the sites thus cleared for the erection of sanitary dwellings. They may also go into the open market, if so minded, and purchase vacant land for the construction thereon of dwellings.

* See the *Builder* for March 29.

This work, it will be seen, is of a destructive as well as of a constructive character, and in considering the question of municipal housing, it is necessary to draw a very clear line between these two classes of work, which are totally distinct from one another. The destructive work is a compulsory duty carried out by the municipality for the benefit of the whole community, and at the sole cost of the whole community. Although Parliament has enacted that the compensation to the owners of the insanitary property purchased for demolition is to be assessed on the most severe terms, yet the difference between the purchase money of the old property and the market value of the sites cleared by its demolition is always considerable, and this difference is increased by the fact that the cleared land is earmarked for the erection of working-class dwellings, and can only be sold at the price it would fetch in the market for this restricted purpose.

It is not proposed in this paper to deal with many economic problems involved in the destructive side of the question. The following remarks apply solely to the constructive housing work which begins with the purchase of the cleared or vacant sites for dwellings.

The constructive work is a voluntary undertaking carried out on borrowed capital, and in respect of which the whole community reaps no immediate financial benefit, although the ultimate financial benefit is considerable. The destructive work during the period of redemption is exceedingly costly to the ratepayers. The constructive work during the same period should not cost the ratepayers anything. The destructive work finally vanishes from sight after the loan has been repaid. The constructive work leaves behind it property of great value.

The difficulties of constructive housing are due chiefly to an inadequate recognition of the financial conditions under which it has to be carried on. Municipalities are in this respect subject to the same laws as individuals. Their action is and must be largely influenced by financial considerations, and even a temporary disregard for these considerations inevitably sets up reaction, and in the long run impedes progress.

The first point to remember when studying housing finance is that it is an organic structure, and, like other organic structures, is subject to the laws of growth. Given this fundamental fact, the line of action almost becomes self-evident. It consists in the simple duty of guarding the growing structure from influences likely to check or impede its full development. These checking influences may arise from either of the three classes of persons which co-operate in the work of municipal housing, viz. (*a*) the stockholders ; (*b*) the ratepayers, represented by the municipalities ; (*c*) the rent-payers. Progress can only be made if each of these three classes is satisfied that its interests are being adequately watched. If doubt arises, the class concerned will either ask a higher price for its co-operation, or it will cease to co-operate. It is necessary, therefore, to consider in detail the functions performed by each of these three classes of persons. In a general way, it may be said that the willing co-operation of any one of these three groups can be secured by guaranteeing to it the market value of the services rendered by it. The stockholder, for example, cannot very well grumble if he receives the market rate of interest for the capital advanced by him. The ratepayer will be willing enough to perform his share of the work if he can assure himself that, at no immediate loss to himself, he is building up a property* that is visibly increasing in annual value, and even a rentpayer's prolific power of complaint is lessened by the knowledge that there are numerous applicants waiting to take his place.

(a) *The Stockholders.*—The functions of the stockholders are briefly to provide the sinews of war. The method of raising money, however, varies in different cities. London adopts the simplest, and, perhaps, the most secure, method by advertising its loan issues in the open market at a fixed price, and allotting the amount of the loan proportionately among the applicants. The rate of interest payable on the loans varies from time to time, according to the condition of the money market, but to avoid the disturbance caused by these periodic fluctuations, the rate of interest paid for the housing work of the London County Council has been fixed at 3 per cent., a figure perhaps fractionally in advance of the mean rate of interest, averaged over a period of years.

These loans are raised for definite periods, varying from thirty years in the provinces to sixty years in London and Glasgow. This latter term is the limit allowed by Parliament for housing loans. Some years ago the loan period diminished during the intervals between the periods of issue ; but this inconvenience has now been removed, and as far as London is concerned, money can be taken up at any time for the full term of sixty years.

In Glasgow the Corporation maintains what is known as a "Floating Loans Fund." Shipowners and merchants deposit in the fund capital that is temporarily not needed. It is on call at a month, and the interest is fixed each year in May and November, at rates slightly above the current bank discount rate. The following table gives the rates of interest paid by the Glasgow Corporation during recent years :—

Year.	Amount of Loan.	Rate of Interest, Per cent.
	£	£
1898-9	1,273,357	2 13 2
1899-00	1,276,785	2 18 6¾
1900-1	1,287,025	2 19 10¼

Liverpool and Manchester carry out their housing work on borrowed capital at rates of interest varying over a period of years from 2¼ per cent. to 3¼ per cent. On March 31, 1901, the average rate of the Manchester undertaking was 3*l*. per cent. It is the practice of some other cities to apply to the Local Government Board for a separate loan for each housing undertaking, the Local Government Board being the Government Department that is entrusted with the administration of the Local Loans Fund. This is a Three per Cent. stock guaranteed by the Imperial Government and is now quoted at 100¾ per cent.

It will be seen by this comparison that the floating loan system obtains money at the cheapest rates, but this system is hardly capable of indefinite extension, and as the rate of interest fluctuates from year to year any period of financial stress affects prejudicially the whole housing work in a way that is rather disturbing. This element of luck is not possible with a financial system based upon an equal annual payment for interest fixed to run at this same rate during the continuance of the loan.

One of the most interesting aspects of housing finance is the question of the sinking fund for the compulsory repayment of loans. This is a question that is watched with some jealousy by the British Treasury. Acting under its advice, Parliament has formulated certain Standing Orders which require that all money advanced to Local Authorities in Great Britain shall be repaid within certain fixed periods. I use the term "Great Britain" advisedly, because the policy of loan repayment does not seem to commend itself to the Colonial mind ; and I believe I am correct in stating that the great public works of Australia are carried out on the principle of permanent loans without provision for repayment. The argument advanced is that the primary consideration is the development of the country, and the security against depreciation is to be found in the improved value that the Colony as a whole secures by the free use of the capital. The policy of the Australian Government in this question may not be financially sound. The periodic financial crises that occur in Australia lend weight to the view that it is not financially sound, but the position of the British Government seems to err in the other direction, with the result that enterprise is seriously and perhaps needlessly checked. The error lies in the fallacy that the security will have entirely lost its value at the expiration of the sinking fund period. In other words, that the substantial housing estates of the great British corporations resemble the baseless fabric of a vision, and that at the end of the Sinking Fund term they will have faded,

* NOTE.—This word "property" was misunderstood in the discussion to mean real estate only. The intention of the writer was that it should bear the wider meaning of the term, and include not only the actual real estate, but also the cash product of the real estate in the form of Sinking Fund accumulations. These two items added together constitute the municipal "property" which in this sense "visibly increases in annual value."

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leaving not a wrack behind! This position is so obviously untenable that the attention of statesmen is gradually focussing upon it as one of the first questions to be tested by the light of scientific inquiry. There is no desire as far as I am aware to imitate the boldness of the Australians and to dispense with the Sinking Fund altogether, but there is a strong and growing view that the terms of repayment should be made more elastic. At present, as has been stated, the Sinking Fund term varies from thirty to forty years in the provinces to sixty years in the metropolis. There seems to be no reason why the provinces should not be brought up to the same scale as London. Then the indestructible land is treated in the same way as the destructible buildings erected upon the land. The reason is not clear why it should be necessary to redeem the cost of the land. It will not deteriorate as time goes on. In all human probability it will increase in value, and the gradual redemption of the buildings upon it will annually increase the value of the whole security. It has also been urged that the maximum term for loans (including the land and buildings) should be extended from sixty years to 100 years. The importance of this extension to us as architects may be gauged from the fact that it would automatically transform each 100*l.* of capital available for constructive purposes into 116*l.* Oddly enough, the greatest housing loan of the nineteenth century, *i.e.*, the Glasgow Improvement Trust Scheme of 1866, was granted by Parliament without any specific provision for repayment, and on May 31, 1901, Glasgow had only accumulated 10,257*l.* as a purely voluntarily Sinking and Reserve Fund in respect of an outstanding capital debt of 1,287,025*l.* This striking Parliamentary lapse was corrected in the 1897 scheme, which was approved subject to a sixty years' sinking fund.

The method of sinking fund repayment differs in different cities. In London the system adopted is what is known as the cumulative annuity system. In addition to the ordinary simple interest a sum of money is deducted each year from the gross revenue received, and invested at compound interest. These annual equal instalments, plus the compound interest on each of them, produce at the end of the sinking fund period a sum equal in value to the amount of the original loan, which is then repaid. This system is in itself economical, and has the added advantage that the sum to be deducted each year from the revenue does not vary from year to year. Financial experts will, I am sure, pardon the introduction of a somewhat homely illustration of the working of this principle. It is as if a snowball were formed out of the receipts, and set a-rolling at the end of the first year after the buildings were opened. This snowball would continue rolling during fifty-nine years. At the end of the second year, a second snowball of the same size as the first would be formed and set off on a similar journey. And the completion of the third year would witness the formation and departure of a third ball. And so on each year during the whole fifty-nine years. When the sixty years were ended, the fifty-nine snowballs, which by that time would have assumed fifty-nine different sizes, would be rolled into one ball, and that great ball would represent the total amount of the loan. In some other cities repayment is secured by the provision of equal annual instalments of principal, with the result that the charge for interest and sinking fund is greater during the earlier years of a loan than at the later period. The disadvantage of this latter system, known as the instalment system, is that it is very difficult to arrive at an annual estimate of receipts and outgoings, and the difficulties of producing a proper housing balance-sheet needlessly enhanced.

(b) *The Ratepayers.*—The functions of the second class of persons concerned, viz., the ratepayers, are somewhat analogous to those exercised in ordinary business by executors and guarantors; as executors they have to manage the estates as a trust and not for personal profit; as guarantors they have to make good the deficits, if any. Skilfully managed on ordinary business principles a housing estate should pay its way, but if any deficit appears, it has to be made good out of the current rate. It is therefore highly important in the interests of the ratepayers that the housing accounts of a municipal corporation should be kept entirely distinct and published separately from the general accounts. This separate housing balance-sheet should show every item of expenditure that is directly due to the housing work. If this separate balance-sheet is not published the ratepayers cannot see the financial effect of their operations, and liabilities may be incurred that otherwise would be avoided. Quite recently one of the most important municipalities in Great Britain determined to disentangle the housing accounts from the general accounts, with the result that the housing work was found to be drawing a subsidy from the rates to the extent of nearly 5,000*l.* a year on a capital outlay of 189,000*l.* Another municipality of equal standing happens to be profoundly concerned by the presence within the city of a large number of back-to-back houses inhabited by persons of a limited earning power. The municipality is building new dwellings to house this very helpless class, and is restricting the occupation of the new dwellings to them, and to them only. However desirable, and perhaps in the present case, however necessary it may be to restrict occupation to a particular class of persons, it is clear that the standard of rent is thus artificially lowered below the ordinary market standard. There is, of course, no administrative reason why a city, if it be so minded, should not underlet its tenements. It is purely a question of local policy. But the ratepayer may fairly require that the amount of this subsidy should be clearly set forth in the housing balance-sheet. Again, arguments have been advanced advocating that the sinking-fund charges should be debited to the ratepayer rather than to the rentpayer. This is again a question of policy, but if such a policy were adopted, the amount of these sinking-fund charges should be calculated, and carried to its proper place in the housing accounts so that the ratepayer may be able to tell at a glance what the municipal housing work is costing him. There is, of course, no need for it to cost him anything. The policy of London is based upon the principle that it should not cost him anything. It is true that in London the ratepayers have advanced to the housing account a sum of 6,943*l.* 17s. 1d., but this was a temporary advance, and the housing account is now almost in a position to repay the loan. There was a cash balance in hand on March 31, 1901, on the housing account of 4,033*l.* 4s. 7d., so that the real amount of the outstanding overdraft at this date was 2,910*l.* 12s. 6d. With this exception, which will probably disappear this year, the constructive housing work of London has not cost the London ratepayer anything from first to last. Moreover, the reserve fund for repairs and renewals has now grown to 8,934*l.* 18s. 2d., and the sinking fund accumulations to 19,811*l.* 12s. 2d. Summarised, the financial change in the London housing accounts from the date of their inception to March 31, 1901, is as follows:—

Housing Account L.C.C.

DECREASE IN VALUE.

Rate-subsidy	£6,943	17 1
Depreciation in value of estates	?	

INCREASE IN VALUE.

Sinking fund balance ...	£19,811	12 2
Reserve fund for repairs ...	8,934	18 2
Cash in hand	4033	4 7
Appreciation in value of estates	?	

(Capital expenditure to March 31, 1901 = 772,125*l.* 3s. 5d.)

The Glasgow property is of somewhat exceptional character. It formed part of a great improvement scheme carried out at the cost of the ratepayers, and the constructive housing work, as it were, gradually emerged from the unremunerative improvement scheme. In other words, the rate contribution to the improvement diminished as the housing work grew stronger. The rate stood at 6d. in the 1*l.* in 1866, and fell gradually, until in 1895 it was ¼d. in the 1*l.*, and in 1896 ceased altogether. Thenceforward the estate has been self-supporting, and has accumulated 10,257*l.* in the Sinking Fund account.

In the case of some other well-known British municipalities it is difficult to get precise information as to the financial position of the housing work owing to the absence of balance-sheets containing the whole of the essential facts. We are told, for example, what rate of interest is obtained on the capital invested, but we are not told what the annual outgoings for interest and Sinking Fund amount to. If this information were published it would probably be disclosed that the constructive housing work was being carried on at a heavy annual cost to the ratepayers, having regard to the restricted character of the operations. It is fair to say, however, that this is chiefly due to the exceedingly short loan terms under which most of the work had been carried out. If these cities were enabled to consolidate their housing loans into one stock, redeemable at the Metropolitan term of sixty years for all purposes, the rate-subsidy would probably disappear.

(c) *The Rent Payers.*—This class of persons occupies a position contrary to that of the stockholder. It has no permanent interest in the estates, but simply occupies the tenements as it would occupy any other tenements, paying the market value of the accommodation afforded. It is true that in very exceptional circumstances the municipality—*i.e.*, the ratepayers as a whole—may think fit to let some tenements at less than their market value, but it is clear that such an artificial arrangement has no permanent basis. The school of thought, for example, that argues that in cases of compulsory expropriation the tenant should pay the market value of the tenement from which he has been dispossessed, irrespective of the market value of the new tenement, does not contemplate, so far as I am aware, that such an arrangement should remain in perpetuity; and, speaking generally, I think it may fairly be assumed that rent, like water, will in time find its own level.

This brief summary of the respective functions of these three classes of persons will enable the general economic position to be grasped. Market rates of interest on the one hand, market rents on the other, and a sufficient working margin between the two to enable temporary fluctuations to be covered. This may seem a simple statement of the complex and complicated housing question, but most complex questions can be reduced to simplicity by the elimination of the non-essential. It may, however, be urged that I have described a condition of stability and not one of growth. This is not, however, the case. The stability that I have described is a necessary precedent to growth. But the growth is very real. As has been stated, the Sinking Fund is framed on the assumption that the land and buildings will have become valueless at the expiration of the Sinking Fund period. This assumption is clearly inaccurate, as the land and buildings will possess a very considerable value at that date. But the Sinking Fund is accumulating more rapidly than the actual value of the property is diminishing. Therefore, at any given time, the sum of the Sinking Fund accumulations, plus the then value of the property, is mathematically bound to exceed the total of a similar sum taken at any previous period.

To illustrate the growth from actual figures a table is given showing the annual amounts of the Sinking Fund accumulations in the London estates. The totals given against each year's dates represent the sum of

(*a*) Total of previous years' accumulations;

(*b*) Interest upon total of previous years' accumulations;

(*c*) Normal annual instalments from buildings already in fund;

(*d*) First annual instalments from new buildings completed within previous years.

Growth of L.C.C. Sinking Fund on Housing Estates.

Year.	Sinking Fund.
1895 6	£1,103 11 5
1896-7	3,228 13 9
1897-8	6,757 8 0
1898-9	10,582 3 8
1899-0	14,536 10 5
1900-1	19,811 12 2

It should be a pleasing thought to London ratepayers that not only is this fund mathematically certain to increase each year, but the difference between each year and the preceding year is mathematically certain to be greater than the difference between any previous two years. This process will continue until the loan has been paid off, when the consequent set-back in the figures will be compensated for by a quickened rate of annual increase, as the annual contribution will then be the whole of the net revenue from the property. When at last this ceases, and the buildings become worn out and incapable of further production, all that will be necessary will be an advance from the Sinking Fund for rebuilding the buildings which, when built, will contribute the whole of

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their net revenue as heretofore. The land, of course, having once been freed, remains free for ever. The method of automatic growth is, indeed, so attractive as to stimulate a mild feeling of regret that the housing work of municipalities was not begun in the days of Elizabeth rather than in those of Victoria.

Such are the financial conditions which govern the housing work of British municipalities, and it is now proposed briefly to indicate the process by which the actual work of housing is carried on under these financial conditions.

The chief administrative difficulties of housing are to be found in the conditions of instability that have to be watched and accommodated as far as possible. There is the labour market, with its demands constantly increasing as the standard of life advances; the "material" market, sometimes violently oscillating from natural and artificial causes; the land market, troubled with the subtle advance of industrialism; and the sensitive rent market. And behind all these varying elements lies the constant pressure of the vast numbers of the overcrowded town populations, who are beginning to realise what they are losing by living under conditions stifling alike to their development in mind and body.

When a housing scheme has to be prepared the simplest method of procedure is for the architect to prepare a preliminary plan showing approximately the character of the buildings that could be placed upon the site.

An estimate should then be prepared of the cost of erecting the building shown on the plan. This should include all the probable capital expenditure, *i.e.*, cost of land, building, architects' fees, quantities, wages of clerk of works, lithography, and all items properly chargeable against capital. It is generally wise to make a preliminary estimate on a cube basis, founded on previous experience. If the financial margin is then felt to be too narrow, rough quantities form a useful check.

The sketch plans are then forwarded to the housing manager for the probable rents and annual outgoings to be estimated by him. These estimated figures should not be the rents and outgoings in force at the time of the estimate, but a forecast of those that will probably be in force midway through the sinking fund term. The figures are of great importance to the architect, and should, if practicable, be studied in detail; for it should be constantly borne in mind that the success or failure of any given building scheme lies not as in any ordinary architectural work in the absolute estimate, but in the relation that the estimate bears to the estimated production of the scheme. In order to facilitate comparison with the estimate of cost, the net annual income reported by the housing manager is converted by him into capital form, and this figure is technically known as the *amount available*.

The next step is for the preliminary *estimate of cost* to be compared with the preliminary *amount available*. If the amount available exceeds the estimate of cost the scheme possesses the elements of success. In any case, it is desirable for the respective estimating officers to confer as to the result disclosed by the comparison. It may be found, for example, that a deficit could be converted into a surplus or a surplus enlarged by some minor modification of the scheme. When both officers concur that the scheme is the best that can be devised, it is presented while in its preliminary form to the Housing Committee and if then it be fortunate enough to meet with approval it is finally presented to the municipality in the form of a typical year's balance-sheet, which, if approved, forms the standard with which all subsequent balance-sheets are compared.

Example of a Housing Balance-sheet.

Accounts prepared to show the estimated effect on the rate of certain working class dwellings :—

(*a*) MAINTENANCE ACCOUNT.

Receipts.	£	s.	d.
To Gross rental	408	0	0
Less—Empties	14	0	9
	£453	19	3

Expenditure.	£	s.	d.
By Rates and taxes	84	19	6
,, Water rate and insurance	18	0	0
,, Repairs	51	9	7
,, Supervision and collection of rents, &c.	31	4	4
,, Contingencies	11	14	0
	197	13	5
,, Balance available for payment of interest and sinking fund	256	5	10
	£453	19	3

(*b*) INTEREST AND SINKING FUND ACCOUNT.

Receipts.	£	s.	d.
To Balance brought down from maintenance account	256	5	10

Expenditure.	£	£	s.	d.
By Interest on cost, viz. :—				
Land (value for housing purposes)	1,000			
Buildings (including all incidentals)	5,261			
	£6,261			
Interest at 3 per cent. on £6,261		187	16	7
,, Sinking fund to replace capital raised, £6,261, in fifty-nine years by cumulative annuity at 2½ per cent.		47	10	10
,, Estimated annual surplus		20	18	5
		£256	5	10

If the procedure here outlined is carried out with care and judgment, there is no reason why the housing work of a municipality should not proceed smoothly and without giving ground for reasonable public criticism. Progress will become more rapid as the work becomes more familiar to those concerned, and to this end intercommunication between the various municipalities engaged in the common work will probably be of great service. Permanent movement, however, will probably only take place along the path marked out by the limiting boundaries of "Amount Available" and "Estimate of Cost." If these limits are overstepped the economic laws violated will seek to reassert themselves. Schemes have been advanced, for example, for the Imperial Government to make advances of capital at less than its current market value, but this is only a form of subsidy on the part of the general taxpayer to help meet the rent of certain individual members of the community. The idea of letting tenements at less than their market value is open to the same criticism, as is a somewhat similar proposal to debit the Sinking Fund charges against the ratepayer instead of the tenants. If progress is to be quickened, energy will probably be more usefully employed in endeavouring to widen the space between the boundary limits rather than by overstepping them. This can be done either by—

(*a*) Reducing the cost of production by improved organisation, taking full advantage of modern machine production;

(*b*) Increasing the amount available by perfecting the system of management;

(*c*) Extending the Sinking Fund term.

Bearing these three points in mind, there seems to be little doubt that patient continuance in the present work will do much towards the solution of a question that is, in the opinion of those competent to form a judgment, at the root of most of our social anxieties.

Artisans' Dwellings from the Private Point of View.

Mr. Louis Ambler then read the following paper :—

When the Committee of the Architectural Association did me the honour of asking me to read a short paper on this subject, I had some diffidence in accepting the invitation on account of my very limited experience and knowledge of the matter, and also because most of the ground has been so recently covered by our good friend Mr. Blashill in his most admirable and exhaustive paper on "Working Class Dwellings in Blocks," read before this Association only two sessions ago,* and the series of papers on the same subject read by Mr. Owen Fleming and others a few weeks afterwards at a meeting of the Royal Institute of British Architects in this room.† My plea of knowing so little about it was met by the reply that others knew less, and I was prevailed upon to undertake the task by the assurance that some of the members knew nothing about it. It is, therefore, to those members that I must chiefly address my remarks, while craving the indulgence of those who are better informed.

As most of you will probably have to carry out artisans' dwellings for private clients before doing so for public bodies, it may be useful to consider the subject from the private point of view. In planning buildings, we all know that among the chief difficulties are the restrictions of the sites, and it seems to me that the question of sites is one of the principal differences between the subjects of the two papers presented to-night. Whereas the sites for municipal artisans' dwellings are usually planned as part of a large scheme, with wide streets and open spaces, the sites for buildings of this class erected by private individuals are frequently plots of ground hemmed in by buildings on two or three sides, and with comparatively narrow streets in front. The private client naturally wishes to use the site—for which the rent is probably heavy—to its utmost limits, and the problem for the architect is generally to get the largest possible amount of accommodation that the site will allow (for, of course, the smallest possible amount of outlay), rather than the best type of building, which, though economical of itself, may waste any portion of the available site. Consequently, what would be considered the standard minimum sizes for rooms in municipal artisans' dwellings, would not be adhered to in the case of private buildings of the same class, but a lower or smaller standard would be considered sufficient, varying, of course, according to the limits and restrictions of the site.

Practically, it amounts to this: one has to take the plan of the site and consider what is the largest cubic space on it that can possibly be occupied by buildings, having due regard to questions of light and air, and the various sections of the Building Act or Regulations, such as the height of the building and width of street, the angle of 63½ deg., and the open space in the rear, and the numerous other points affecting workmen's dwellings.

If the street be narrow, it may be possible to plan a larger, because higher, building by setting back, provided that the site be deep enough. If the site be very deep it may be possible to erect parallel blocks; but there are many difficulties and restrictions with regard to this which cannot very well be gone into in this paper.

It may be well to consider the evolution of the artisans' "dwelling," as it is called, from the simple cottage, or row of cottages. I need hardly describe the latter in detail, as all of you are, no doubt, quite familiar with them. It is evident that where space is limited, as in large towns, one can get more dwellings on a site by building them one above another than side by side, and the first step in this direction is the type of building which we may call the cottage flat. The simplest example of this type is perhaps the two-story building, as shown on the plans of those erected on an estate in North London.

Each division between the party-walls contains two separate self-contained tenements—practically a complete cottage on each floor—each with its own approach from the street and front door, and its own yard and small garden behind. The ground-floor tenement contains an entrance passage, front room 12 ft. 6 in. by 12 ft. with bay-window, back room 12 ft. 6 in. by 11 ft., coal place under the staircase leading to the upper tenement, kitchen or living room, 11 ft. 3 in. square, food store with a small window, scullery with a sink and copper, and a water-closet. The upper tenement, with its back and front staircases, contains the same accommodation, with an additional small room over the two front entrances. The average total cost of these buildings was about 420*l.* each couple of dwellings. The ground-floor tenement lets for 8s. per week and that on the first floor for 9s., the owner paying the rates, &c. The rate of interest on the total outlay is about 6 per cent.

I may here remark that buildings of this class should always be erected by contract if they are intended to pay. In the case that I have just mentioned the first block or group were put up by contract for less than the amount of my estimate of 400*l.* for each double tenement, calculated at 5d. per cubic foot, and as my client thought he would get them better built without a contract he was persuaded by a relation who owns a large amount of cottage property, to employ a clerk of works and have the buildings put up without contract, but according to the same specification, the clerk of works buying the materials and employing the labour. The result was that the cost was 450*l.* per couple of dwellings, and the experiment of building by that method was abandoned. Evidently the clerk of works could not buy materials so cheaply as a builder, nor get as much work out of the workmen, who would do more for a builder, knowing that he had taken the risk of a contract, than they would for a clerk of works who simply paid them by the hour and took no risk.

The "clerk of works and no contract"

* See our issue for February 17, 1900.
† See our issue for April 7, 1900.

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system may be all very well for a house which the owner is building for himself, and where he can perhaps supply part of the materials off his own estate. Then his only object is to have the best work—more or less regardless of cost; but in the case of artisans' dwellings to be built to pay, it is a very different matter, and I believe that the contract system is the only feasible method of doing such work for private individuals.

A further development of the cottage-flat type of dwelling may be seen in the plans of those in Lisson-grove, where each tenement occupies two stories instead of one, each having its separate gate and entrance from the street, and each its own portion of the yard space in the rear. The lower tenement occupying the basement and ground floor comprises a five-roomed dwelling, having also a scullery with a sink and copper, a storeroom, coal place, and water-closet, two of the rooms being 12 ft. square, two 11 ft. 6 in. by 10 ft. 6 in., and one 8 ft. 3 in. square. The upper tenement occupies the first and second floors, and is approached by an enclosed staircase from the front street door, and has an outside open air staircase down to the yard at the back. The accommodation is similar to that of the lower tenement, but the rooms on the top floor are rather larger, owing to the walls being thinner, and there is one additional small room over a portion of the staircase, &c.

The cost of these buildings was at the rate of 6½d. per cubic foot, or an average of 60*l.* per room, sculleries and other offices, &c., being thrown in. The lower tenement is let for 11s. a week, and the upper one for 13s., this being at an average of about 2s. 3d. per room, inclusive of rates and taxes. The buildings pay at the rate of 5½ per cent. on the total outlay. It should be mentioned in respect of the cost per cubic foot of these buildings that an exceptionally low tender was obtained, and also that owing to older buildings existing on both sides of the site there were no party walls at each end to build, added to which there were no breaks or projections whatever, either back or front, for the projecting windows shown in the front upper rooms were not allowed by the County Council.

We now come to the third type of artisans' dwellings, that is, the block of tenements having a common staircase. As staircases, landings and passages are not directly rent-producing, they must necessarily be reduced to a minimum, and the larger the number of rooms approached by one staircase, the more economical is the arrangement, provided that space be not wasted in passages. The other most important point in the planning, with regard to economy, is that the building should be if possible a simple parallelogram, two rooms deep, and without any breaks or projections either back or front, as these involve thick walls all round, and add considerably to the cost. The two points are illustrated in the dwellings in Southwark. The site was rather deep, but the street in front very narrow, so that it was necessary to set back 20 ft. from the centre of the street, and to build the single block as deep as possible, in order to obtain the largest amount of internal accommodation that the site would allow. For economy of staircase and passage space, the front entrance was planned at the level of the half-pace landing, and it will be seen that by this arrangement, no space is wasted on any floor.

On the other hand, the third room built out at the back is comparatively expensive, as it has thick walls all round. A more economical block of buildings could have been planned for the site, with only two staircases instead of three, but this would have meant the loss of six rooms on each floor, twenty-four rooms in all, and the large ground rent did not warrant this curtailment of accommodation, involving also the loss of much space behind as well as the large area that had to be given up in front.

The dwellings are planned as tenements of three rooms, except three of two rooms on the ground floor, but they are so arranged that they can be let as separate tenements of one room, or any number up to six, the front room being the single tenement, the two back rooms the double-roomed tenement, and so on. The front and middle rooms are each 12 ft. by 10 ft. 6 in., the back room 10 ft. 6 in. by 7 ft. 6 in. The middle rooms are fitted with hob-grates, so that a small amount of cooking may be done in the case of this and the back room being let together, this room then becoming the living room (as well as bedroom possibly). No sculleries are provided, but a sink was arranged on each landing, out of the way of the traffic. These sinks, however, were omitted in execution, and only the water-supply, with draw-off taps on each landing, remained.

One washhouse, with two coppers and washing-troughs, is provided for each block containing twenty-three rooms, and the tenants use the washhouse in common, the days and times of such use being arranged by the resident superintendent, the general practice being that the tenants of each floor use the washhouse on the same day, thus making the four middle days of the week suffice for that purpose. The washhouses are locked up from Friday night until Tuesday morning, and only opened occasionally on a Monday to oblige a tenant for some special reason. The yards in the rear afford ample drying space.

In these buildings no food stores were provided, owing to the very limited space; but I believe that cupboards for this purpose, with coal-bunkers underneath, have since been fixed in the recesses between the chimney-breasts and the outside walls in the living-rooms. It will be seen from the elevations that hardly any attempt was made to give any architectural character to the design beyond a little variety of colour and texture, as the object was to obtain the largest amount of accommodation for the smallest outlay, and to provide only a decent-looking but perfectly plain exterior. These dwellings cost 8½d. per cubic foot, or 69*l.* 10s. per room, but they were built in 1898, when building prices were at record heights. The rooms are let at average rentals of 3s. per week, including rates and taxes. The buildings pay 4 per cent. on the total outlay.

All buildings for the artisan classes should be as fire-resisting as possible, and the construction should be solid throughout, with no hollow spaces for dirt and vermin to collect. The floors should be of cement breeze concrete, with the boarding nailed directly on to the concrete, the boards of the lowest floor being tarred underneath. I have found 1 part of Portland cement to 6 parts of clean, sifted gas breeze suitable for floors, and the same in the proportion of 1 to 5 for staircases and landings; the floors 6 in. thick being finished with a floated face in cement and fine sifted breeze to receive the wood flooring, and, where not boarded, finished with 1 in. thick smooth Portland cement floated bed.

The concrete of the upper floors and landings has ½ in. solid square wrought-iron rods embedded therein, 1 ft. apart, 2 in. above the underside of the floors, the rods being in as long lengths as possible, and laid on fir beams, usually about 9 in. by 6 in., fixed about 4 ft. apart, and notched at the top to form a key for the concrete floors, chases at least 1 in. deep being left in the walls for the same purpose. These floors are much less expensive than the usual steel or iron joist and concrete fireproof floors. All window and door frames and linings should be bedded solid, and casements are preferable to sashes, on account of the hollow spaces in the sash-frames. Casements are, however, frequently broken off their hinges, or the hanging styles are often broken, by being flung open too violently, but sash lines and beads suffer similarly, so there is not much to choose between them on that score. Skirtings should all be of cement, and no woodwork should be used where it can reasonably be avoided. Staircase balustrades and hand-rails should be of iron. If of wood they are frequently used for firewood. Ranges and coppers should be portable, so that they can easily be taken out and replaced when necessary. Service water pipes should be of iron, as far as possible, not lead. Granite plaster, laid in two coats, is much harder than ordinary lime plaster in three coats, and costs very little more. I think the best finish for plaster walls in these buildings is washable distemper, the staircases and landings having high painted dadoes. Some people prefer the living rooms papered, the tenants certainly do. For all external painting I like ivy-leaf green, and for internal woodwork, the most economical and serviceable treatment is staining, say American walnut colour, and varnishing. Sanitary fittings should be of the plainest, simplest, and strongest quality, and lead waste pipes and soil pipe-connexions should be avoided. The former should be of earthenware, and the latter of galvanised cast iron, made to the required length and angle. Cross ventilation is essential in all parts of the building, by means of windows and doors not ventilators or air-bricks, which the tenants stop up if they can get at them. Ventilating air-bricks are, however, desirable close to the ceilings of the water-closets, and where the top landing window of a staircase is much lower than the ceiling, a ventilating-shaft from the highest level of the ceiling may be an advantage. Open air staircases are now almost universally condemned, and I think them objectionable, as a rule. Dust shoots are most undesirable, in my opinion, and the pail or dust-bin emptied every day meets all requirements in that respect.

As regards the broad question as to whether these buildings pay, whether they are a good investment or not, so much depends on the site and its possibilities and restrictions, the value or rent of the ground, the cost of the buildings, the position and surroundings, the neighbourhood, the character and proximity of other buildings, and, above all, the wise and careful management of the property. It is clear that private individuals who put up buildings of this class in small blocks on limited and restricted sites are at a disadvantage compared with municipal bodies and large trusts who can deal with huge blocks and vast areas. In these large schemes there is more scope for architectural treatment than in small ones. The varieties of groups and masses, tall gables, oriel windows, turrets, and other architectural features are rarely possible to the private builder of these dwellings, unless imbued with more than the average amount of philanthropy and the means to carry out such buildings on a large scale. I have endeavoured in the preceding remarks to avoid repeating what has been said in recent papers on the same topic, as far as possible, but I fear that certain truisms and repetitions of many of the dicta before laid down are almost unavoidable in a paper of this nature. I hope I may be forgiven for any trespasses committed in this respect, and it only remains for me to thank those architects who have kindly lent some of their drawings to illustrate the subject of my short discourse.

The Chairman, in opening the discussion, said the two papers were very valuable. The subject was a great one, and it was looked upon by statesmen as being one of the foremost questions of the day, which must now receive practical attention. Those who had read Mr. Rowntree's work on the poverty of York, in which he proved that the poverty of the provincial towns was as great as that of London, would recognise what an important subject it was they were discussing. Though he could not see what was to be the outcome of such a condition of affairs as that which existed in York and elsewhere, he hoped that the great amount of energy which was being brought to bear in the matter would ultimately lead to something which would better the condition of the least fortunate of our working classes, apart altogether from vice or extravagance, or anything of the kind. It seemed unavoidable that a large percentage of the population should live in abject poverty, and so sad a fact in a nation of the enormous wealth of England was greatly to be regretted. People might talk philosophically about the sacrifice of the lower to the higher type, and try to prove that the sacrifice of the very poor enabled the higher type of man to become more highly trained, so that, in the end, that would react and lead to discoveries which would improve the condition of the poor. It was rather in the quiet working-out of the problem that we might look for improvement. He did not know whether Mr. Fleming had any strong views as to the probability of cheap and rapid transit in and from a city like London having an influence on the ultimate value of property; it seemed rather an important point.

Dr. J. F. Sykes said they were all indebted to Mr. Fleming for the self-denial he had shown in refraining from going into the architectural side of the question in order to devote himself to the financial side, which, in matters of this kind, was so much less interesting. He was glad that Mr. Fleming had laid stress on the difference between the destructive and the constructive work in housing the working classes. Mr. Fleming very properly gave an account of the constructive side, and left the destructive question, as it was impossible to cover the whole subject in a short paper. He wanted to point out that in the paper

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there was an undertone which showed that Mr. Fleming felt that the attacks made on municipalities in the matter of housing had been, from the point of view that they held a position financially superior to that held by the private individual, and Mr. Ambler, in his paper, laid great stress on the true fact that it was a difference of site values. It was not the wish of the municipality, but of Parliament. When a municicipal authority had to deal with an area, it bought that area at its market value and re-credited it at its housing value, whereas the private individual bought land for housing at its market value, which was the value of the land, plus the buildings upon it in each case. The private individual, when he proceeded to erect working-class buildings on it, was not presented by Parliament or the ratepayers with the difference between the value of this land for building working-class dwellings and dwellings or buildings for any other class or purpose. The municipality should be presented by Parliament, through the Housing Act, with the difference between the market value and the housing value. That was the gist of the whole question, and not only did the London County Council benefit by that, but the Peabody trustees and other companies did, for the late Metropolitan Board of Works sold sites to the companies at their housing value, and those companies, to this extent, had been subsidised. That subsidy question was one which ratepayers must always consider. Nevertheless, an authority should have the power of destroying what ought to be destroyed, *i.e.*, all insanitary areas, which were a danger to the community. Mr. Fleming pointed out that the growth of the sinking fund goes on at a quicker rate than the depreciation of the value of the buildings and the land—as a matter of fact the land was appreciated—and at the end of a certain time the municipality would find itself practically in possession of a large fund. Now, that fund ought to go back to where the original amount came from. Most of the ratepayers who found the money would not be living at the end of the sixty years period, but that fund ought to be disposed of to the benefit of their successors, and the ratepayers who first found the money to destroy the insanitary areas and improve the sites ought to realise that they were protecting themselves and improving the locality for posterity. Mr. Fleming said: "The ratepayer will be willing enough to perform his share of the work if he can assure himself that, at no immediate loss to himself, he is building up a property that is visibly increasing in annual value." True, it was increasing in value, but it was also increasing in rental. Another class altogether occupied the houses, which were erected for the working classes, and that was a sign of the times. Moreover, he thought that was a good sign. It was much more expensive to build now than formerly, not only on account of the rise in the cost of material and labour, but because of modern civilised requirements. The man who, fifty years ago, was willing to live in a hovel, would not do so now; he had advanced in his ideas and requirements, and he wanted a better house than he did formerly, and fifty years hence he would want a better one still. People sometimes said, "You ought to build for the very poorest." That could not be done, and he should be sorry to see the architectural profession trying to do so. To build down to the requirements of the lowest and poorest of a population was the very worst thing they could do; they should build up, and he did not believe that architects would build down to suit the requirements of the very poor. They should remember, when they built dwellings for the better class of working people, that the class going into the better houses gradually left the older class of dwellings vacant, and these the very poor occupied. They were not so well constructed as the superior houses he referred to, nor did they contain the requirements which modern houses ought to possess, but they were better than the demolished houses from which they were displaced. There was a tendency in certain working-class dwellings to build piles of rooms one on top of another and to arrange the sanitary and domestic conveniences just as though they were building an ordinary house, so that people had to run about to get to the sink or lavatories, and so on, and the people were more like rabbits in a warren than human beings. That, of course, was not desirable, and one thing to aim at was the building of dwellings in such a way that they should be really "homes" for the working classes—he would like to see that word substituted for "dwellings"—and not sardine boxes. Abroad they understood building flats much better than we do, simply because such creations were comparatively new here, and one could see how earnestly architects in this country were at work in the designs of such buildings, and how they were striving to cut out a line of their own rather than follow the designs of foreign architects. In reference to Mr. Ambler's remarks as to the type of building which might be called the cottage flat, he thought they must distinguish between the suburban and urban home and the central city house; that was to say, if they were going to build a building in St. Luke's for the working classes, they must construct a different sort of building from the kind they could erect in Tottenham, for instance, where there was more space. When the amount of land was restricted, these big blocks of buildings had to be erected, and the problem was often very complex. Although Mr. Ambler referred to a building in which separate one-room tenements could be obtained, he (the speaker) hoped no one would build new dwellings with one-roomed tenements. The single man or woman who wanted one room could easily obtain such accommodation in lodging houses, Rowton houses, or elsewhere, but single-room dwellings for families ought not to be provided. It was a difficult matter to provide a dwelling for a family when there were from three to six children, but those were the people to consider, for they were the people who carried on the nation, and not the single man or woman. Family life could not be carried on in one-room tenements, for it was degrading in the extreme, and the provision of such accommodation in new buildings was unpardonable. Ordinary houses were let down to tenement houses when they had been forsaken by the better-class. Mr. Ambler said that staircases, landings, and passages were not rent-producing. That was very true, but if architects were very economical in that respect they were apt to put too many dwellings on one staircase, and that was done by constructing accommodation most inferior in regard to light and air, and which was very unhealthy. There was a limit to the number of healthy dwellings that could be put to one staircase. As Mr. Ambler said, open staircases were objected to, but still they were the proper thing in that class of building. With a closed staircase in a big block of buildings, the air supply was shut in and the conditions were very unhealthy. The open staircase need not be open entirely to all winds and rains, but open to such an extent as to fully prevent the interchange of air from one dwelling to another. In regard to sculleries, sinks, &c., when there was no sink in a block of rooms much the same conditions existed as in the ordinary tenement house let down to one or two roomed tenements and the social status of the people was absolutely lowered, and the status of the whole household was dragged down to the level of the worst occupant. It was important to make these dwellings as private as possible, and for that reason the occupants must have their own water-tap, sink, &c. The occupants of each tenement should have a scullery by all means, even if it added a little to the cost, and the same remark applied to the water-closet and the wash-house. If they must have a common wash-house, it ought not to be used on the same day by more than one family, and many dwelling companies had learnt that. Women revolted at the idea of washing their dirty linen in common: they met women in the common wash-house with whom they did not wish to associate, they could not take their young children with them, and the common wash-house had always been a failure. Wash-houses which were erected by municipalities were mainly used by professional washer-women: the large percentage of those who used the common wash-house washed for half a dozen families. Mr. Ambler very properly objected to dust-shoots. There were many matters in connexion with the erection of these dwellings in addition to the purely architectural, and architects ought to study them carefully.

Mr. Guy Nicholson said that Mr. Fleming had put forward one theory which seemed to be dangerous, particularly as he was an official of the London County Council. Mr. Fleming advocated that the time for repayment of loans on artisans' dwellings should be altered from 60 years in London to 100 years, on the ground that the dwellings would still exist. He seemed to take it for granted that these artisans' dwellings would not only be a permanent thing, but that they would increase in value, though, as had already been pointed out, if they increased in value they would cease to be artisans' dwellings. It was best to repay these debts as soon as possible, as fresh loans were sure to be raised, and debt had a tendency to increase. Moreover, it was not certain, even in London, that property would increase in value. Other cities had gone down, and there was a limit to the possible size of a city. Really, these artisans' dwellings were a temporary cure for a disease. It seemed to him that the tendency was for industries, owing to the increased cost of wages, &c., to be driven from London into the country, keeping head offices in London. In doing that they would be better able to produce cheaply enough to compete with the foreigner; the workpeople would be benefited (they would have decent cottages to live in rather than the unsatisfactory dwellings they had in London), and the farmers, instead of sending the produce of the farms to town and paying heavy railway rates and market dues, would find a market close at hand, where they could dispose of their produce cheaply. We should thus decrease the overcrowding and benefit the country districts. The idea of letting the redemption of debt in the matter of the erection of these dwellings extend over a period of 100 years seemed unsound, for other means of raising loans might be found. It was not safe, moreover, to assume that site values were a permanent value.

Mr. W. J. H. Leverton said there would always be a large number of people to be accommodated in London and other big towns, whatever they did in the way of moving industries to the country. What ought to be provided was quicker means of transit than we had at present. Electric trams and trains had been suggested for the purpose of taking people to the green fields, but, judging from the way things were going now, there would soon be very little left in the way of green fields near the big towns. Quicker trains were certainly wanted, and it ought to be possible to go twenty miles in twenty or twenty-five minutes

Mr. H. P. G. Maule said there was great need to do something. In the East-end of London the people were living like rabbits in a warren. There was no yard to many of the houses. It was all very well to talk about going to the country, but the people wanted housing at once, and schemes like Boundary-street and Millbank were necessary and good, for a certain class of the community was helped and improved at once.

The vote of thanks having been agreed to heartily,

Mr. Fleming, in reply, said it was not quite clearly understood what he meant when he said that the value of the property increased. He did not mean that the actual selling value of the buildings increased; on the contrary, it would rather go on depreciating until the buildings became valueless; but at the same time, concurrently with the depreciation, there was the increase of the cash balance—the sinking fund—which went on increasing year by year, until in the sixtieth year, according to the present scheme, it equalised the whole cost of the land and buildings. As to Dr. Sykes' point as to whether the ratepayers ought not to receive back again the capital sunk in the transition from the destructive to the constructive stage, who would receive it back again? The ratepayers evidently would—the future ratepayers. It should, however, be remembered that it was not the ratepayers of a particular year who spent the money, but the ratepayers for sixty years, as the capital sunk in the destructive or unremunerative work was spread over a lengthened period, in the same way as the constructive or remunerative work. The future ratepayers would reap what the present generation were sowing. [Dr. Sykes said he referred to the matter to show how the private owner was handicapped in regard to building.] As to the necessity of incurring the cost in regard to these destructive and constructive sites, the destructive work was compulsory, and municipalities had no option in the matter unless they were too poor. The work had to be carried out for the benefit of the whole community, and it was done under Part 1 of the Act. Part 1 was not used so much now, but Part 3 was coming more to the

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front, and a municipality under Part 3 was in exactly the position of the private owner.

Mr. Ambler said he was not capable of dealing with the question of finance in relation to this matter, because an architect who was called on to design buildings for a private owner was not called upon to go into the subject, and he could only speak of his own experience in the matter. As to the point raised by Dr. Sykes as to one-roomed tenements, which he very properly objected to, it was never the idea to let them to families. They were supposed to be let to elderly married couples without children. In well-managed tenements there was always a careful selection of tenants. In regard to the number of rooms to a staircase, Mr. Blashill, in the paper already referred to, gave many plans, embracing almost every solution of the question, and one of the plans showed thirteen rooms to one staircase. Of course there were some passages, but thirteen rooms seemed to be too many. As to sculleries and sinks, he quite agreed that sculleries should be provided wherever possible, but one had to provide buildings according to instructions, and sculleries for that reason could not always be arranged for. He did not advise the omission of sinks, but he was told that the omission of them was not too inconveniently felt. As to washhouses, he was told that in the case of two families on a floor the washhouse was used simultaneously, and the arrangement worked very well.

The Chairman announced that the annual members' soiree would be held on June 4, at St. George's Hall, when a musical play would be performed, entitled "Arctia: A Legend of the Far North," written by Mr. Gervase Bailey.

The meeting then terminated.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday afternoon in the County Hall, Spring-gardens, Mr. M'Dougall, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Battersea Borough Council 2,285*l.* for electric lighting; Woolwich Borough Council 1,090*l.* for street improvement and erection of mortuary; Shoreditch Borough Council 37,430*l.* for electric lighting, street lighting, and meters; Kensington Borough Council 6,278*l.* for street improvement; Stepney Guardians 7,240*l.* for works at workhouse; and Greenwich Guardians 4,590*l.* for purchase of premises and drainage works.

Coronation of their Majesties.—The General Purposes Committee reported as follows, the recommendation being agreed to:—

"We have had under consideration the question of the course to be taken by the Council in the matter of decorations and illuminations on the occasion of the approaching Coronation of their Majesties. We are confident that it will be the unanimous wish of the Council on behalf the people of London, to give some expression in this manner to their feelings of loyalty to the King, and to take their share in the general rejoicings which will surround the Coronation, and we desire to suggest to the Council that Westminster Bridge and Waterloo Bridge, the Victoria Embankment and the Embankment Gardens, together with the offices on the lines of route, should be decorated and illuminated. The Embankment will lend itself to a very effective scheme of illumination which would perhaps have considerable advantage in affording some attraction to the crowds from the more or less narrow streets in which the illuminations would ordinarily be seen. With regard to Westminster Bridge, we have had before us an application on behalf of the students of the Modelling School of the Royal College of Art, asking to be allowed to carry out a design for the decoration of the bridge, the most important feature of the scheme being the provision of portrait busts of Kings and Queens of England. The busts, which would be modelled by the students of the school, would be arranged on each side of the bridge—busts of Queen Victoria and Queen Elizabeth occupying the central positions—and would be placed on pedestals among festoons of foliage hung from poles. We are of opinion that a scheme of decoration designed by the students of the chief national art school of this country would be of considerable interest, and we think it will be the wish of the Council to accede to the application now made, as a mark of its appreciation of the educational work carried on in London. The students will not be in a position to do more than supply the statuary of the Kings and Queens above referred to, together with painted shields and other emblems which will be fixed to the pedestals, and it will be necessary for the Council to arrange for the construction of the pedestals and for the provision of the poles and festoons. We think, however, that we should have no difficulty in arranging for this part of the work to be carried out, although it may not be practicable for the exact design of the school in this respect to be strictly adhered to. As regards the statuary, the whole of the artistic talent will be given by the students, and the Council will only be asked to defray the cost of casting the models. The total cost of the decorations and illuminations which we propose should be undertaken by the Council, and which we have indicated above (including the scheme for the decoration of Westminster-bridge by the students of the modelling school, which will cost about 500*l.*), is estimated at 3,500*l.* . . . . We recommend—(*a*) That the estimate of 3,500*l.* submitted by the Finance Committee be approved, and that the Council do sanction an expenditure not exceeding that amount for decorations and illuminations to be undertaken by the Council in connexion with the public celebrations of their Majesties' Coronation. (*b*) That the General Purposes Committee be authorised to enter into contracts and to take all other necessary steps with a view to carrying out the decorations and illuminations above referred to."

Housing: Clare Market Scheme.—The Improvements Committee reported as follows:—

"The Council on October 15, 1895, upon the recommendation of the Public Health and Housing Committee, agreed to carry out the Clare Market housing scheme under the powers conferred by Part I. of the Housing of the Working Classes Act, 1890, and the London (Clare Market, Strand) Improvement Scheme, 1895; and the Council on October 29, 1895, approved an estimate of 381,400*l.* in respect of the gross cost of the scheme. Section 59 of the London County Council (Improvements) Act, 1899, authorises the Council, with the consent of the Home Office, to utilise any of the lands acquired under the housing scheme for the purposes of or in connexion with the Holborn to Strand improvement. It was originally intended that a portion of the land acquired for the Clare Market scheme should be set aside for the erection of buildings to accommodate a certain number of the persons of the working-class who would be displaced. When, however, powers for the carrying out of the Holborn to Strand improvement had been obtained we arranged with the Home Office that a larger portion of the Clare Market area should be devoted to commercial purposes, and that other land in the neighbourhood should be acquired for rehousing. Accordingly, sites at Russell-court and Duke's-court, Drury-lane, were purchased for re-housing in connexion with the Holborn to Strand improvement and the Clare Market scheme, in addition to the land set apart for the same purpose at Millbank and at Reid's brewery site, Clerkenwell. The buildings to be erected on the Drury-lane sites were estimated to accommodate 1,000 persons, and as of this number 750 represented the obligation in respect of the Clare-market scheme, the Council decided that three-fourths of the cost of acquiring the sites should be charged to the account of the scheme, and the remaining one-fourth to the account of the improvement. The sum to be charged to the account of the Clare-market scheme amounts to 60,241*l.* 0s. 2d., and the effect of this arrangement has been to increase the estimated gross cost of the scheme. The expenditure on the purchase of property for the scheme up to March 31, 1902, amounted to 391,501*l.* 9s. 3d., or 10,191*l.* 9s. 3d. more than the vote of 381,400*l.* passed by the Council in 1895. We understand that there will be further expenditure amounting to about 6,000*l.*, and this will increase the present excess to 16,191*l.* 9s. 3d., or, say 16,500*l.* It will be observed that but for the expenditure of 60,241*l.* 0s. 2d. on additional rehousing sites, as mentioned above, the actual gross cost of the scheme would have been considerably less than the original estimate. Under the present conditions it is not anticipated that the ultimate net cost of the scheme will be more than the original estimate, but rather the reverse. It is necessary for us to obtain the formal sanction of the Council to the increase of the gross estimate, and we therefore recommend that the supplemental estimate of 16,500*l.* submitted by the Finance Committee in respect of the Clare Market scheme be approved, and that the Improvements Committee be authorised to incur further expenditure on capital account up to that amount for the purpose of the scheme in question."

Mr. Bruce said it was a mistake to use valuable commercial sites for the erection of workmen's dwellings.

Mr. Low said that the housing work of the Council would never pay so long as this policy was pursued.

Mr. Hunter said it was most desirable to house the people near their work.

Mr. Cousens remarked that the Council had already written down the value of their land by nearly 250,000*l.* for housing purposes.

The recommendation was agreed to.

Tenders.—The following tenders were agreed to:—

Repairs, &c., at workmen's cottages, Barking Outfall, W. Harris, 181*l.* 5s.

Fuel economiser at Crossness outfall, Messrs. Arthur Lowcock, Ltd., 305*l.*

Valves and grids for sewage pumps at North Woolwich pumping station, Messrs. Clayton, Goodfellow, & Co., Ltd., 110*l.*

Reconstruction of Rosemary-branch-bridge, Shoreditch, Messrs. Wilkinson Bros., 9,985*l.*

Reconstruction and enlargement of drying closet and provision of hot-water apparatus at Scotland Yard Fire Station, Messrs. J. Outhwaite & Son, 267*l.*

Electric light installation, Scotland Yard Fire Station, C. O. Clark, 134*l.* 15s.

Supply and erection of iron fencing at Horton Asylum, E. J. Raybould & Co., Ltd., 532*l.* 0s. 4d.

Machine tools, Horton Asylum, Tangyes Tool and Electric Co., 131*l.* 15s.

Electric motor, Horton Asylum, Thos. Parker, Ltd., 171*l.*

Electric Lighting and Power.—The Parliamentary Committee recommended an immediate application to Parliament for powers to enable the Council to utilise the Pimlico gas-works, which they have purchased for 80,000*l.*, as an electricity generating station for the Council's tramways. They reported the rejection of the London County Council (Electric Supply) Bill.

The report was adopted.

Low-flash Oil.—The Public Control Committee observed that they had from time to time reported as to the fatal and other accidents attributable to the use of low-flash oil in lamps, and the Council had on several occasions recorded its conviction that those accidents could nearly always be prevented if the statutory flash-point of petroleum were raised to 100 deg. In February, 1901, the Committee were able to report a decrease in the number of such accidents, but the improvement had not been maintained. They now asked the Council to authorise a further representation to the Home Secretary in favour of immediate legislation.

This was agreed to, and the Committee were asked to report further as to bringing the matter forward at the autumn session of Parliament.

Steam from Locomotives.—The Public Control Committee called attention to the fact that the emission of steam from locomotives using the roads was very dangerous to ordinary vehicular traffic, and recommended that a communication be addressed to the Commissioner of Police, asking him to inform the Council of any cases which might come to his notice, with a view to the Council taking proceedings under the Locomotives Act, 1865, or the Light Locomotives Act, 1896.

The recommendation was adopted.

Certificates of Competency to act as District Surveyors.—The Building Act Committee reported as follows, the recommendation being agreed to:—

"We have considered a letter from the Secretary of the Royal Institute of British Architects asking whether the Council would have any objection to the Royal Institute holding once a year, instead of twice as at present, the statutory examination under the London Building Act, 1894, and other Acts of Parliament for certificates of competency to act as district surveyor in London and building surveyor under Local Authorities. It is stated that the smallness of the average number of candidates (about four) does not warrant the Council of the Institute in asking the statutory examiners to give their gratuitous services twice a year. We do not think that any inconvenience would be caused by the examinations being held only once a year, but the Council is only interested in the matter so far as relates to district surveyors. We recommend—'That the Secretary to the Royal Institute of British Architects be informed that the Council has no objection to the statutory examination under the London Building Act, 1894, for certificates of competency to act as district surveyor being held once a year, instead of twice as at present.'"

Housing.—The Housing of the Working Classes Committee reported as follows:—

"Sheridan and Beaumont buildings, the remaining two blocks on the Duke's-court site, Drury-lane, are now almost ready for occupation. They provide accommodation for 380 persons in ten tenements of one room, forty tenements of two rooms, twenty tenements of three rooms, and ten tenements of four rooms. With the completion of these buildings accommodation for 610 persons will have been provided in the immediate locality for persons displaced by the carrying into effect of the Clare Market scheme and the Holborn to Strand improvement. In accordance with practice, preference is being

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given to applicants for tenements in these buildings who have been, or will be, displaced by the scheme and improvement mentioned."

"Morland-buildings, Millbank-estate, are now ready for occupation. They are situate at the northern end of the estate facing Earl-street. The buildings provide accommodation for 300 persons in thirty tenements of two rooms and thirty tenements of three rooms."

Holborn to Strand—Site for the Gladstone Memorial.—The Improvements Committee reported as follows :—

"The Council on March 13, 1900, agreed to allot to the Gladstone Memorial Committee, subject to certain conditions, a site in the Strand to the west of St Clement Danes Church for the purpose of the monument proposed to be erected by the Memorial Committee. We have consulted the Memorial Committee and Mr. Hamo Thornycroft upon the question of the exact site which should be reserved for the memorial, and we have also had before us the views of the Chief Commissioner of Police upon the subject. As a result we have decided that a site occupying roughly the centre of the open space in the Strand between St. Clement Danes Church and the eastern horn of the proposed crescent block would be the most suitable for the purpose. We communicated our opinion to the Westminster City Council, and a reply has now been received to the effect that the City Council has approved the approximate position of the memorial as indicated by us. We report the facts for the information of the Council."

Embankment Tramways.—During the sitting of the Council it was announced that a Parliamentary Committee had sanctioned a portion of the Council's scheme of tramways on the Victoria Embankment.

The Council adjourned for the Whitsun recess until Tuesday, June 10.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—A dinner to commemorate the incorporation of this Society was held at the Walker Art Gallery on Wednesday, April 30. There was a large attendance of members and friends. The following toasts were submitted to, and honoured by, the company :—"The King," proposed by the President of the Society, Professor Simpson; "The Royal Institute of British Architects," proposed by Mr. Edmund Kirby, and responded to by Mr. E. W. Mountford; "The Liverpool Architectural Society," proposed by Mr. Harold Batsson, and replied to by the President, who reviewed the work done by the Society during the past session; "The City," proposed by Mr. E. A. Ould in a humorous speech, and acknowledged by Mr. R. A. Hampson, Chairman of the Corporation Estate Committee; "The Allied Societies," proposed by Mr. W. E. Willink, and replied to by Mr. Alfred Darbyshire, President of the Manchester Architectural Society, and Mr. R. E. Morrison, President of the Academy of Arts; "Our Guests," proposed by Mr. J. Woolfall, and replied to by Mr. A. Musker, President of the Liverpool Engineering Society. The evening proved an unqualified success.

MOUNT VERNON HOSPITAL FOR CONSUMPTION: COUNTRY BRANCH, NORTHWOOD.—On Tuesday afternoon Princess Christian laid the foundation-stone of this building. The new building is designed to extend the work of open-air treatment of consumption. It provides accommodation for 100 patients, fifty male and fifty female. The wards are arranged in linear series all facing south, with a spacious cross ventilated corridor on the northern side, off which the lavatory blocks are placed, and connected to it by another cross ventilated corridor. The administrative block is placed between the two wings proper to each sex, and contains doctor's and matron's rooms, dispensary, library, recreation rooms, and, on the top floor, accommodation for servants. Two isolation wards are provided. The nurses' home, kitchens, doctor's house, and secretary's offices are all separately placed at some distance from the main patients block, and connected to it by a wide corridor. The patients' dining-hall, which is common to both sexes, is also detached. Pathological rooms, mortuary, laundries, and electric lighting station will also be provided. The plans of Mr. Frederick Wheeler, of Staple-inn, W.C., were selected in competition, and his design is being carried out by Messrs. Holland & Hannen. The design for the patients' block is in the Royal Academy Exhibition.

WAKEFIELD-STREET IMPROVEMENTS.—Mr. M. K. North, Local Government Board inspector, held an inquiry at the Town Hall, Wakefield, on the 9th inst., in respect of an application made by the City Council for sanction to borrow 2,416*l.* for purposes of street improvement.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—At the meeting of this Institution, held on May 2, at the Westminster Palace Hotel, the Chairman (Mr. Percival Marshall) presiding, the paper read was on "Some Factors in Colonial Railway Construction," by Mr. Lewis H. Rugg, Stud.Inst.C.E. The difference between a colonial railway and a light railway was first dealt with. It was shown that the latter was one on which the rails and general character and construction were light as a whole, and the speed and carrying capacity of the trains low in comparison with the standard main lines of the country. The cost of colonial railways varied between 6,000*l.* and 10,000*l.* per mile, per a single track, with average maximum gradients of 1 in 45, 5 chain curves, and rails weighing 50 lbs. per yard. It was now recognised as false economy to reduce the weight of rails, but as the weight and, therefore, cost, was frequently about one-third of the whole cost of the line, good design of rail was most essential. The sections should vary with the size, on account of the strength varying as the square, and the stiffness as the cube. Sleepers should be placed nearer together than was the practice in England. From a financial point of view, steep grades and high summit leads were desirable, it being quite a mistake to suppose and to agree with the popular idea that easy grades and curves resulted in a successful railway. Sharp curves should never be adopted, except where necessary to avoid heavy earthworks, as they diminished the speed of trains, and advantage could not be taken of the energy given to the train on the down grade to assist it in the next ascent. For this reason, sharp curves were most undesirable at the bottom of long gradients. Nothing less than 2 ft. 6 ins. should be adopted per gauge; this was adequate for the sharpest curves. Except in mountainous districts where sharp curves were necessary, or where a very inexpensive line was proposed, there were no advantages in adopting a gauge less than the standard of the country. Rolling stock could be of the same weight, and the formation width could also be the same. The only disadvantage, and that a small one, was the extra length of sleeper. On the other hand, the limited space for the locomotive machinery was an undesirable feature of the narrower gauge. In dealing with surveys, the author pointed out that the tachcometer was unfortunately still to a large extent ignored in this country. Its advantages were apparent, as it contained the theodolite, chain, and spirit-level in one. In laying down the line on the plans, gradients were often compensated for curvature, and although formulæ were proposed, no definite results or figures had ever been given, with any degree of accuracy. Compensation was not considered in this country, partly, no doubt, on account of the fact that the percentage of curvature was small. In constructing earthworks it was not necessary that banks and cuttings should balance, as material for banks, with cheap land and labour, was more economically obtained from side cutting. The Mono rail trucks, made by the Mono Rail Portable Railway Co., were recommended where two rails were objectionable, so offering greater facilities to progress with ordinary native labour. Steel sleepers (about double the cost of creosoted sleepers) were frequently used, durability being greatly in their favour, but they did not give the ease and elasticity to running which were characteristic of the timber sleeper. Steel pipe culverts were recommended for rapid construction. A simple riveted circular section about 4 ft. long, with angles at the ends for jointing to the next section, was advised for cheapness and ease of transport. It could be readily rolled along the ground, and could also be nested with smaller sections for shipment. Another form of steel pipe culvert by the Phœnix Co., Derby, was referred to, which was built up in pressed steel sections. With reference to bridges, half-through girders, if applicable, were to be preferred to through girders. They were cheaper and most rigid. Where timber was cheap the Howe truss should be adopted. There was no actual economy in making trestle bridges in place of banks, except through swampy ground, or where great heights were encountered, and where first cost was an important factor.—A vote of thanks was passed to the author, and in the discussion on the paper Messrs. E. Eade, R. P. Dawbarn, G. C. Allingham, A. H. Tyler, G. H. Robus, F. S. Pilling, T. E. Moorhouse, H. Thomas, G. and L. Peyrecave, H. C. Reid, C. Stevens, and F. W. Dunn took part. The author having replied, the proceedings terminated with a special notice with reference to the summer excursion of the Institution to Lancashire, Preston, Blackpool, &c., August 9 to 16.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Hampstead.—Buildings, with shops on the ground floor, on the south-west side of Haverstock-hill, Hampstead, southward of Belsize-avenue (Mr. C. J. Bentley for Mr. J. C. Hill).—Consent.

Clapham.—A one-story addition to a house on the north side of Upper Tooting Park-road, Upper Tooting, to abut upon Boundaries-road (Mr. W. Hunt).—Consent.

St. George, Hanover-square.—An open stone portico, with balcony over, at the entrance to No. 27, Curzon-street, Mayfair (Mr. R. G. Hammond for Mr. J. Garlick).—Consent.

Woolwich.—A wood and glass porch at the entrance to a house known as The Harbinger, Southwood-road, Eltham (Messrs. Logsdail & Beale for Mrs. L. Banks).—Consent.

Width of Way.

St. George, Hanover-square.—A building on the site of Nos. 3 to 9 (inclusive), South Molton-street, St. George, Hanover-square (Messrs. Giles, Gough, & Trollope for Symonds Hotel Co.).—Consent.

St. George, Hanover-square.—A building on the site of No. 13, South Molton-street, St. George, Hanover-square (Messrs. Read & Macdonald for Mr. C. F. Scripps).—Consent.

St. Pancras, West.—A one-story addition at the rear of No. 140, Arlington-road, St. Pancras, with the external walls of such addition at less than the prescribed distance from the centre of the roadway of Underhill-street (Mr. L. V. Hunt for Mr. T. J. Brinsmead).—Consent.

Westminster.—An office building on the site of Nos. 10, 11 and 12, Great College-street, Westminster (Mr. H. Shelmerdine for the Lancashire and Yorkshire Railway Co.)—Refused.

Width of Way and Omission of Concrete over the Site of a Building.

Haggerston.—The retention of a one-story shed at No. 12 wharf on the north side of Canal-road, Kingsland (Messrs. Dottridge Brothers).—Consent.

Working Class Dwellings.

Bermondsey.—A block of intended dwelling-houses to be inhabited by persons of the working class, and proposed to be erected on a site situated on the south-eastern side of Leroy-street, Old Kent-road (Mr. R. Robertson for the Housing Committee of the Council).—Consent.

Means of Escape from the Top of High Buildings.

City.—Means of escape in case of fire, proposed to be provided on the seventh stories of two buildings, one being Nos. 20 to 26, Copthall-avenue, and the other No. 65, London-wall, City (Mr. R. B. March for the City of London Real Property Co., Ltd.).—Consent.

Cubical Extent.

Hackney, North.—An addition to Block 2 of a factory building on a site on the west side of Tyssen-street, Dalston-lane, Hackney (Messrs. Sachs and Hoffman for Messrs. Shannon, Limited).—Consent.

Separation of Buildings.

Hammersmith.—Uniting of No. 41A with No. 43, Goldhawk-road, Shepherd's Bush by the formation of two openings, at the ground floor level, in the party wall between those premises (Messrs. Richardson & White for Mr. G. H. Gibbs).—Refused.

Dwelling-Houses on Low-Lying Land.

Lambeth, North.—A building on low-lying land situate at the corner of Short-street and New Cut, Lambeth (Messrs. Flood & King for Mr. S. Frewer).—Consent.

Bermondsey.—A building on the site of the Bunch of Grapes public-house, Long-lane, Southwark (Mr. E. Faux for Messrs. G. Harding & Sons and Messrs. Courage & Co. Limited).—Consent.

Lambeth, North.—A building on low-lying land situate at New Cut, Lambeth, being the site of Nos. 1, 2, and 3, New Cut (Messrs. Goodwyn & Sons for Messrs. Harvey & Thompson).—Consent.

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Illustrations.

SOUTH PORCH, STA. MARIA MAGGIORE, BERGAMO.

THE Church of Santa Maria Maggiore, at Bergamo, is enriched with two beautiful porches, one on either transept. That on the north side is the better known of the two; it is famous as an early example of colour decoration by the contrast of materials. As is so frequently the case in Italy, this porch was not designed for its present position, but was removed from a church in the lower town. It does not appear that this was the case with the south porch, which we illustrate; although it has not the same splendour of colour and carving as that on the north side, it is, in our opinion, even a more splendid design. The use of lions to support the columns is, of course, characteristic of northern Italy.

W. CURTIS GREEN.

ST. JAMES'S CHURCH, LEEDS.

ST. JAMES'S CHURCH is an octagonal building of no architectural pretension, standing among some of the worst slums of Leeds. It is stone built, and is completely blackened by the Leeds atmosphere.

It was originally built by members of Lady Huntingdon's connexion in 1801 and christened Zion Chapel. In 1802 it was sold to the Rev. John King. There were then only five churches in Leeds, whereas there are now seventy-five. In 1840 the Rev. G. A. Poole became vicar; he was the author of "Ecclesiastical Architecture in England" and other architectural works. He himself designed the apse, with an elliptical arch at the east end.

Last year it was decided to entirely renovate the church. This was carried out in the autumn at a cost of about 2,500*l.* The seating is in pitch-pine, stained green, and the organ case, pulpit, and panelled dado to chancel are in unfumed oak. The stencil decorations were executed under the direction of Mr. Bailey by Messrs. Roylance & Horsman. The prevailing colour of the walls is pale green.

The pulpit was executed by Mr. Hamilton; the general builders' work by Messrs. John Wood & Sons; and the joinery by Mr. Banks Mawson.

The floor is covered with unglazed red tiles, except in the chancel, where black and white marble is used, and the chancel steps, which are of St. Anne's marble—this work was done by Mr. Frankland; the heating was carried out by Mr. Craven; and the plaster work by Messrs. Pennington & Sons (all of Leeds).

Messrs. Bedford & Kitson were the architects for the work.

The illustrations are from photographs by Mr. Chas. R. N. Pickard, of Leeds.

BATTERSEA WORKING-CLASS HOUSES COMPETITION.

THE design for a five-roomed house, two stories high, which appeared last week, showed the living-room. parlour, and scullery, &c., planned on the ground floor, and three bedrooms on the first floor. This house differs from the other four designs of the competition in respect to the water-closet, which is projected at the rear, thereby giving greater space and light to the scullery.

The design illustrated in this issue shows a house consisting of two self-contained tenements planned with a living-room, two bedrooms, scullery, and water-closet on each floor, the sculleries and water-closets being disconnected by an open lobby.

This house is planned for two families, and separate entrances are provided from a common porch. It will be noted that the upper floor has a staircase down to the yard at the rear. Externally this design is faced entirely with red brick, which differs somewhat from the elevation of No. 1, which has a rough-cast frieze the full depth of the first-floor windows.

With the exception of house No. 1 all the rooms of the several designs are contained within four walls, and special effort has been made to devise convenient plans, and to procure simple and effective elevations with materials of pleasing colours, well-proportioned windows, and the introduction of rough-cast without resorting to unnecessary gables and unconstructional ornamentation, and it is intended that these be built of red brick, with roofs covered with green slates.

SMITH & WEALD.

COLCHESTER TOWN HALL.

IN a previous issue (September 4, 1897) we gave the perspective view, elevations, and plans for Colchester Town Hall as then designed but not carried out; and in our issue of January 4 of this year we gave a pretty full description of the completed building.

As the hall is opened this week, we give another view, taken from the building itself, and illustrations of two of the ceremonial chairs for the Mayor, made by Messrs. Arrowsmith & Co. from the designs of Mr. J. Belcher, A.R.A., the architect of the building.

COMPETITIONS.

ISOLATION HOSPITAL, BURSLEM.—The following circular has been sent by the Borough Engineer to the competitors for this building:—"I beg to inform you that Mr. W. Geo. Laws, M.Inst.C.E., of Newcastle-on-Tyne, the assessor appointed by the Town Council, has selected the designs of the following architects in order of merit: 1. Messrs. Sutcliffe & Sutcliffe, architects, Todmorden; 2. Mr. E. C. H. Maidman, architect, Edinburgh; 3. Mr. W. H. Walley, architect, Burslem; 4. Mr. T. R. Longden, architect, Burslem. Thirty-two sets of designs were submitted. The Town Council have not yet considered the question of exhibiting the various designs, but when they have done so I will communicate their decision." The buildings are designed for forty beds, the limit of cost stated in the instructions being 8,000*l.*, exclusive of roads, fences, &c. The first premium is 100*l.* and the second 50*l.*

TOWN HALL EXTENSIONS, JOHNSTONE, N.B.—Some time ago the Johnstone Council appointed Mr. M. M'Farlane, architect, Paisley, to adjudicate on the competitive plans for the improvements and extensions to the Town Hall. Mr. M'Farlane's Report has just been submitted. He found that No. 4 plan was, in his opinion, the best suited for the requirements of the town, and No. 1 plan he considered entitled to second place. At the meeting when the Report was submitted, a long discussion took place, and on a vote being taken the Council approved of No. 1 plan in preference to the plan No. 4 recommended by the expert, but several of the members present expressed a preference for the plan suggested by the expert, which seemed a combination of the four competitive plans forwarded to the Council. On the sealed envelopes being opened, it was ascertained that the architect whose plan was approved by the Commissioners was Mr. Robert M'Lelland, Bath-street, Glasgow. At the same time several members of the Board made no secret of their conviction that the plan put in by the expert, Mr. M'Farlane, was the most practical of the lot, combining, as it did, the best parts of the competitive plans sent in, and it will be no surprise if Mr. M'Farlane's plan is the one which may be finally adopted.—*Paisley Daily Express.*

THE TIMBER TRADES' BENEVOLENT SOCIETY:

FESTIVAL DINNER.

THE second festival dinner of the Timber Trades' Benevolent Society was held on Wednesday evening, at the Trocadero Restaurant, Piccadilly Circus. Mr. D. J. Morgan, M.P. presided, and among those present were Col. Bird, T. P. O'Connor, M.P., T. H. Cullis, W. L. T. Foy, J.P., F. Tiffary, Howard Burton, T. Hugh Capron, H. H. Burton, C. T. Fraser Churchill, Lawrence H. Neame, A. H. Bonnin, G. F. Neame, H. L. Skelton, C. Onley Tagert, Keith Price, A. Chatterton Sim, T. M. Heywood, Louis Bamberger, C. J. Wade, G. H. Lindsey Renton, B. M. Bergman, Sidney Brownfield, Samuel Brownfield, A. W. Spencer, R. Barrett, Victor Webster, Flower Grimes, E. C. Wiseman, C. Herbert Renton, Bignell G. Elliott, G. A. Payne, E. W. H. Beaton, A. Harding, J. Liddell, W. H. Wyatt, H. W. Bayne, T. Mabbs, W. Baker, J. Archer Smith, F. Craggs, S. T. Mollinson, James Richardson, C. A. Stewart, G. E. Dollery, R. H. Dollery, E. Hayres, C. E. Musgrave, and G. T. B. Cobbett.

After the usual loyal toasts,

Mr. T. H. Cullis proposed "The Timber Trades' Benevolent Society." He said the Society existed to relieve the necessitous and deserving members of the timber trade and their wives and children, to extend a helping hand to those who had fallen wounded in the struggle of life, to relieve the pangs of poverty, and to comfort the widow and orphan in their distress. The Society owed its inception to the kindly thought and beneficent energy of Colonel Bird and Mr. Wade. It was founded in 1837 only, but it was a lusty youngster, and gave promise of a fine manhood. While congratulating themselves on the past, they desired that the success should be increased and the usefulness extended. If the aims of its founders were to be fully realised, and if it was to be worthy of the important, wealthy, and flourishing trade with which it was connected, it should receive a larger measure of support. He did not know much about practical forestry, but he understood that the roots of a tree extended as far as the limits of the branches. To apply this to the Society, he thought that the sources from which it drew its support, its sustenance, should be as widespread as the circle of its beneficence. While London had responded very liberally indeed to the call, the provinces had not yet fully realised the principle to which he had alluded. There were some notable exceptions, chiefly in the west country, for which they were grateful. It would be a thousand pities if the work of the Society was curtailed—if, when the aims of its founders were almost cosmopolitan, the Society should be restricted to the metropolis; but he feared there was a possibility that this would have to be considered unless the response from the provinces was more liberal. However, he would not contemplate that gloomy prospect, because he considered that when the provinces fully realised the matter, they would follow the example set by some of the west countrymen. Again, he thought that the foreign shippers might fairly be looked to for support. There was nothing parochial or provincial about the Society; if an applicant was a member of the timber trade, and had been engaged in the trade for a period of ten years, he was eligible for a pension, irrespective of his nationality, and there was at least one instance in which this rule had been carried into effect with regard to a foreigner. He was sure that the timber trade would never allow the Society to languish for want of funds.

The Chairman, in response, said that the Society was neither a sick club nor a benefit society. The object of the founders was that the Society should help distressed members of the trade, their wives and children, either by means of pensions or temporary assistance. As regarded pensions, they knew that when persons fell upon evil times a little money coming in regularly was about the best possible solace they could receive. In giving temporary help the rule was that the names of the recipients should not be published. This was an exceedingly good rule; the object of giving temporary assistance was to enable a man who had slipped off the last rung of the ladder to mount it once more, and, if possible, to achieve prosperity again by hard work; but if his name was published that object might be hampered, if not frustrated. In all instances the cases were investigated by a committee with the greatest care. It was perfectly true that the Society started in London, but it was not by any means a London society. A large number of those who had been helped came from the country, and it was sincerely hoped that more provincial support would be forthcoming. At this time the timber trade was bad for most of them, and this was all the more reason why the Society should receive a larger measure of financial help. When times were bad employers reduced their expenses, often by discharging somebody, generally one who was not able to work as well as a younger man. This person was most likely to come upon this Society, which, to enable it to extend its operations, needed more support. It therefore entirely depended upon the trade whether the Board of Management took on further liabilities.

Mr. H. W. Bayne, the Secretary, announced that nearly 1,000*l.* had been received by subscriptions and donations. The total of the Chairman's list was 287*l.* 17s., and Mr. Foy's was 342*l.* 6s. Among the other lists were those of Mr. L. H. Neame, 48*l.* 6s.; Mr. Cobbett, 24*l.* 13s.; Mr. J. A. Smith, 38*l.* 11s.; and Mr. F. Tiffany, 37*l.* 19s.

Mr. F. Tiffany proposed "The Visitors,"

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remarking that it was their duty as a wealthy trade to help the needy; they should endeavour to provide for their own.

Mr. T. P. O'Connor, in reply, commented upon the fact that several of the guests described themselves as dockers, and that temporary help was given without the publication of the name of the recipient. He hoped that if he applied for assistance they would not reveal his name, newspaper, or position.

A vote of thanks to the Chairman, proposed by Mr. W. L. T. Foy, concluded the proceedings.

Books.

The Abbey and Church of Westminster. By CHARLES HIATT. London: George Bell & Sons. 1902.

IN addition to their Cathedral Series, Messrs. Bell have issued illustrated accounts of some of the abbeys already noticed in our columns. This is a well-written and illustrated guide to the Abbey, a useful feature being a separate index to the tombs and monuments — evidence in itself of the remarkable series that the church possesses within its walls.

Some of the interior views, by Messrs. Bolas & Co., are the best we have seen; the view of the choir and apse (p. 57), the nave (p. 32), and the interior of Henry VII.'s Chapel (p. 96), are particularly clear and well reproduced. The beautiful detail of the triforium of the south transept is well illustrated on p. 48, and the effigies (or rather the heads) of Henry VII. and his Queen are valuable examples of royal portraiture.

The letterpress gives a clear account of the history of the building, and a systematic and detailed description of the chapels and their monuments, and the conventual buildings still in a great measure in a perfect state. Two plans are given, the smaller one by Mr. J. T. Micklethwaite, the well-known architect to the Abbey, and the writer of the article on it that appeared in the *Builder* Series of Abbeys, January 6, 1894. The larger of the two plans, at the end of the book, might with advantage have been made larger still; it would have increased the value of what is, in all other respects, a capital guide.

The Cathedral Church of Amiens. By the REV. THOMAS PERKINS. London: George Bell & Sons. 1902.

IF we except Abbeville, the Cathedral at Amiens is often the first of the great French churches that is seen by the traveller. Their great height, as compared with our own cathedrals, and the profusion of carving on the porches, are the chief points that strike the English visitor. Amiens possesses both these characteristics in a remarkable degree, and the woodwork of the choir stalls ranks with the finest on the continent. The book under notice, uniform in style and size with Messrs. Bell's series of English Cathedrals, provides an excellent account of the architectural features of this fine church, and the illustrations, entirely from photographs made by the author in June, 1901, are very good. Particularly striking is the view from the north (p. 27); the parapet of the chapels (p. 52); and the interior views and details of the choir stalls, a separate chapter being devoted to them and the part of the church in which they stand. In an appendix, notes are given on other buildings in the town, including the churches of St. Leu and St. Germain. A small ground plan is given at the end of the book, with a reference to the various chapels and monuments.

The Cathedral Church of Chichester. By HUBERT C. CORLETTE. London: George Bell & Sons. 1901.

THIS forms the twenty-fifth volume of the Cathedral Series, and is uniform in style with them, the chief feature being a good series of illustrations from photographs. Chichester may be classed among the less-known of our English cathedrals, but although it has been shorn from time to time of much of its interest, it still is a highly valuable example of the church of Secular Canons—Hereford and Wells being similar in this respect—with a cloister and college of Vicars Choral. The detached bell-tower, from which the curfew is still rung, adds to the picturesque grouping of the cathedral, which makes us deplore the loss of the bell-tower at Salisbury; but the chief interest of the building is to be found in the interior, the Norman work of the nave, the beautiful Early English work in the Retro-choir, and the later work in the Lady chapel. There is an excellent illustration of the interior of the Retro-choir on p. 93, and opposite it one of two or three illustrations of the decoration of the vaulting—that in the Lady Chapel by Th. Bernardi, 1519, being still visible. Chichester has been unfortunate in the treatment of its fittings, and the destruction of the pulpitum or Arundel screen, and its organ. A sketch of these was given in the article on Chichester in the *Builder* cathedral series; also a drawing of Bishop Sherborne's tomb and curious inscription, which are not among the illustrations to the present volume. A description is given of the fall of the central tower and spire in 1866, and we can only be thankful that the building did not suffer more by the catastrophe. In addition to the photographic illustrations are interesting reproductions on a small scale of a section about 1815, shewing an old arrangement before the destruction of the screen and the reredos. Its removal marked the first step in the reduction of the appearance of the interior from that of a cathedral to that of a large parish church, an impression that has hardly been removed by the more modern fittings and arrangements that have taken its place.

The Design of Structures: A Practical Treatise on the Building of Bridges, Roofs, &c. By S. ANGLIN, C.E. Third Edition, revised and enlarged. London: Charles Griffin & Co. 1902.

THIS is the third edition of a book which has already been noticed in these columns, and which is devoted mainly to the discussion of stresses and strains and the strength of the materials used for the construction of framed structures in wood, iron, or steel—a framed structure being defined as "an assemblage of different members composed of these materials, which are joined together by straps, bolts, pins, or rivets." The work is a treatise for the engineer rather than for the architect or builder, but the extending use of metal in the construction of buildings renders certain portions of the book increasingly useful to architectural students.

In the present edition a chapter on the foundations of buildings has been added, in which the safe working loads for different foundations are discussed, and some additional tables giving the weights of iron and steel bars and cast-iron pipes have been introduced as appendices.

Pattern Making. By JOSEPH G. HORNER, A.M.I.M.E. Third Edition, thoroughly revised and much enlarged. London: Crosby Lockwood & Son. 1902.

IN its latest form, Mr. Horner's excellent work is an even more useful vade-mecum to the art of pattern-making than its predecessors. The second edition included a considerable amount of new matter, and in the third we find some thirty-six new pages dealing with patterns for foundry requisites and for plate-moulding, and with the storage of patterns. A good many new illustrations are given, and some of the original blocks have been replaced by others that serve to elucidate the text still more clearly than before. Plate-moulding enables the founder to effect considerable economies, where large numbers of castings are required. The most suitable patterns for such treatment are those which are not complicated by loose pieces, drawbacks, and numerous cores, and the greatest possible economy is secured when a number of patterns can be put on one plate. In plate-moulding, too, the boxes are not brought together until the mould is finished, so the mould has not to be turned, and as the runners form part of the pattern on the plates, they have not to be cut by hand in the ordinary way. Plate-moulding is a system of very elastic character, and our readers will find the new chapter, wherein all details are described, to be worth careful study. A large part of the original matter concerns the engineer more than the architect, but several chapters are of direct interest to the latter. While it is generally undesirable that the architect should prepare working drawings for patterns, it is very important that he should have accurate knowledge as to the essential features of the pattern maker's art, and a more reliable treatise on the subject than that written by Mr. Horner cannot be found.

Bookbinding and the Care of Books. A Textbook for Bookbinders and Librarians. By DOUGLAS COCKERELL. With Drawings by Noel Rooke. London: John Hogg. 1901.

THE tone and method which Mr. Cockerell has adopted in writing upon the subject of bookbinding is fully in accordance with his aim as expressed in his preface. "It is intended," we read, "to supplement, not to supplant, the workshop training." Mr. Cockerell is himself a craftsman, and writes for craftsmen, and the fact that the trade generally have already found in this little book a manual of great practical utility may be accepted as the best possible testimonial to the excellence of the method and manner which Mr. Cockerell has adopted. He has not forgotten, however, the needs of librarians—needs common to all who care for or possess books—the difficulty of ascertaining without personal acquaintance with the craft whether really good and sound work has been put into the binding for which perhaps a high price has been paid; the merits or demerits of particular leathers and dyes; the best methods of repairing old work; and lastly, the way to open newly-bound books. Want of knowledge in these matters is noticeable, even amongst librarians of standing; whilst many private persons, the possessors of large if not valuable libraries, are daily aiding the destruction of their own property through ignorance of elementary precautions against the effects of light, smoke, and damp.

The Society of Arts, upon whose reports Mr. Cockerell has largely drawn, has appointed commissions on both paper for printing and leather for bookbinding. These reports have been published by the Society in pamphlet form, and have been widely circulated throughout the trade with excellent effect. But the public in general will not benefit until a proper description of the various leathers used for bookbinding be published, together with a guide to the identification of the numerous imitations of the more valuable leathers. Indeed, since the action of the Society of Arts in drawing public attention to the debased material in general use in the trade, no book pretending to be a service to librarians can be complete without a chapter devoted to this subject. We hope that the larger book which Mr. Cockerell contemplates publishing will contain the result of his experience of leathers good and bad.

A chapter to which all interested in the progress of applied arts in this country will naturally devote a good deal of attention is that dealing with the decoration of book covers. There is a marked tendency in the modern school of design to adopt a form of conventional flower ornament applicable to any flat surface, and to introduce this form of ornament everywhere regardless of material. No one familiar with what is called the "modern spirit" in design can have failed to remark that the same kind of conventional flower form is used indiscriminately upon wall-papers, tapestries, curtains, carpets, sofa cushions, and lastly, upon leather book-covers. The design exhibited upon p. 236 is a typical example. Every artist will readily observe the convenience of this method of designing; no school-of-art student of two years' standing but could easily acquire the power to build up some such forms. The power so gained becomes his stock-in-trade through life, and he stands as good a chance of becoming draughtsman to a printer or glazier as to a carpet manufacturer or tool engraver.

We believe that books bound by some of our best modern binders will, in spite of their excellent workmanship, fail to hold their own in the libraries of collectors because they lack the charm—the personal charm—of books bound by Eves, Gascons, Mearnes, artists who designed ornament applicable to leather work alone, and who never lost sight of the limits of size, colour, and texture.

MURPHY MEMORIAL HALL, NEW KENT-ROAD.—The buildings for this institute were recently opened by Miss Morley, a daughter of the late Samuel Morley, who was a coadjutor of the Rev. G. M. Murphy in his mission work in that part of London. The buildings have been erected in red brick, with stone dressings, from plans and designs by Mr. Arnold S. Taylor, in the Romanesque style.

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Correspondence.

SEWAGE FROM BATH WASTES, LAUNDRIES, &c.

SIR,—I shall feel very much obliged if you, or some of your correspondents, could advise me in the following circumstances :—

Some time ago, on the advice of an expert on bacteria beds, I had occasion to construct sewage works for the disposal of the effluent from an institution where an average discharge of 20,000 gallons per diem of waste liquid has to be dealt with. The scheme consists of coarse and fine beds on the upward and downward filtration method, but it has, I regret to say, not quite come up to my expectations as regards either the appearance or odour of the effluent after being treated in this way. A large percentage of the waste liquid consists of discharge from baths and soapy water from laundries, &c., and my experience has been that, after passing through the beds and having been allowed to stand in them the regulation time, it comes out practically in the same state as it went in.

What I am very anxious to know is, Does the soda or other matter in this soapy water tend to defeat the object of the beds ? and if so, what is the best way to deal with this difficulty ? Could the bath waste and laundry water be dealt with separately by some inexpensive device by collecting it in a tank ? I am given to understand that this has been done, and that the soapsuds, &c., are then treated in some way with sulphuric acid, which has the effect of collecting the grease or fatty matter on the surface and precipitating the impurities to the bottom of the tank, where they can be collected and disposed of.

If this information is correct, I shall feel extremely grateful for further particulars regarding same, or for the name of any book or pamphlet that would help me in the matter, as I am most anxious that the bacteria beds should have a fair trial.

L. F. H.

*** The information given by our correspondent is not sufficiently complete to enable us to form an accurate opinion as to the cause of failure. It is, however, probable that sufficient time is not allowed for th e initial stages of purification. The distance from the building to the filters is too short, we presume, to allow much change to take place in the sewage during its flow, and as there does not appear to be any tank, the sewage is practically fresh when it passes into the first filter. The duration of contact and the area and depth of the beds are not stated, nor are any details given as to the size and nature of the filtering material or the chemical composition of the sewage and filtrate. The soda in the water from the laundries will assist rather than retard the process of purification, but the grease from the soap and from culinary operations is a different matter. Grease is exceedingly difficult to treat by bacteriolysis. The kitchen grease might be collected in grease-traps, but the soapy fats cannot thus be separated. If the sewage were first passed through a scum-tank of a capacity not less than one day's flow, time would be allowed for important changes to take place, among which is the breaking up of fats. The effluent from the tank might then pass to the existing filters, which would probably be able to continue the process of purification to a satisfactory degree.

The sulphuric acid process has been often adopted for trade effluents, but it would scarcely be suitable for the institution mentioned by our correspondent, as it would necessitate subsequent treatment with lime prior to filtration. Much valuable information on this and other parts of the subject will be found in Dr. Rideal's work on "Sewage and the Bacterial Purification of Sewage" (London: The Sanitary Publishing Company).—ED.

The Student's Column.

PART II.—DRAINAGE.

CHAPTER 18.—SOME EXAMPLES OF DRAINAGE SCHEMES (*continued*).

A SCHEME for the drainage of a country house on the separate system is given in fig. 85. The rainwater pipe in the yard is shown to be connected to the sewage drains, and the surface-water of the yard finds its way to the same drains through the waste-water gullies and through the area gully (S.W.). The bulk of the rainwater from the roof is conveyed by separate drains (shown by dotted lines) to an underground tank (R.T.), into which the suction-pipe of the house pump is inserted. The rainwater is discharged into a small screening chamber, and passes thence through a small filter into the tank. Sometimes the screening chamber is formed in the middle of the tank. The outlet and overflow chamber (O.C.) has a valve for emptying the tank. Surface water from stable yards and carriage drives must be excluded from this tank, either by connexion with the sewage system or by means of other drains discharging on to adjacent land or into a tank, from which the water can be taken for use in the garden.

On that side of the building where two sets of drains are laid, the sewage-drains take an inner course, and the rain-water branches pass over them, so that the rain-water cannot possibly be contaminated with sewage.* The rain-water pipes may be connected to the rain-water drains by means of simple bends, or by "shoes" with access-eyes provided with closely-fitting iron covers; traps are not required. The roof and roof-gutters ought to be kept as clean as possible; it is a good plan to fix at the head of each stack-pipe a perforated copper rose to prevent leaves, &c., passing down the pipe to the storage-tank. The first part of the discharge from a roof may with advantage be run to waste, as it contains a good deal of soot, dust, birds' droppings, &c. This can be effected by means of a rain-water separator. Lead must be used as sparingly as possible in roofs, stack-pipes, and service-pipes, if the water is used for drinking.

The joints of drains conveying rain-water to a storage-tank must be as carefully made as those of sewage-drains, in order to prevent infiltration from manured gardens and the penetration of tree-roots. Drains with defective joints are often completely blocked by roots. Concrete "surrounds" are advantageous in this and other respects.

The size of the storage-tank depends upon the rainfall, the area from which the rain is collected, the purposes for which the water is required, &c. If rain-water is nearly the sole source of supply, the tank must be of sufficient capacity to store the heaviest rainfall and to provide a reserve in time of drought. As a rough and ready approximation, it is often said that for each square foot of roof (measured horizontally) from which the rain is collected, a tank capacity of two gallons ought to be provided. This is for districts where the annual rainfall is near the average. The following table, by W. S. Wilson, F.R.M.S., is of more general application; the figures in columns 3 to 6 are calculated for a roof-area (measured horizontally) of 200 sq. ft.

RAIN-WATER STORAGE.

1	2	3	4	5	6
Mean Annual Rainfall.	Loss from Evaporation.	Requisite Capacity of Tank.	Mean Daily Yield of Water.		
			In Wettest Year.	In Driest Year.	General Mean.
Inches.	per cent.	cubic ft.	gallons.	gallons.	gallons.
20	25	100	6·7	3·2	4·3
25	20	135	7·5	3·9	5·7
30	20	145	9·4	4·5	6·8
35	20	155	11·0	5·0	7·9
40	15	165	13·1	7·2	9·7
45	15	170	14·2	8·6	10·9

The next example (fig. 86) shows the drains from a group of Board School latrines and urinals. The School Board for which these have been designed is of the economical sort, and the scheme must therefore be regarded as a compromise. The latrines are of the syphonic type, arranged in three groups—for infants, girls, and boys respectively—each group having an automatic flushing-tank. The urinals are constructed of polished slate slabs, and are flushed by means of hose-pipes. The river behind the latrines is about 8 ft. below the level of the playground, and the 6-in. air-pipe (A.P.) to the intercepting-chamber (I.C.) is merely carried in a direct line through the river-wall and finished with a 12-in. by 9-in. cast-iron grate built into the wall. A manhole (M) is formed at the head of the drain, and serves as a junction-chamber for the drains from the boys' latrines and urinals and from the rain-water-pipe (R2). A 4-in. cast-iron ventilating-pipe of ¼-inch metal is carried up the wall of the school, and connected to the manhole by 4-in. stoneware drain-pipes; a stoneware rust-pocket is fixed at the foot of the pipe. The intermediate branch-drains are connected to the main by means of pipe-junctions, and a taper-pipe (T.P.) is inserted in the drain immediately above the junction with the drain from the girls' latrines. The drains are of stoneware, with a gradient of 1 in 24. When syphonic latrines are adopted, the ventilation of the drains is essential to the proper working of the apparatus.

Examples of other drainage systems might easily be given, but those already illustrated and described are perhaps sufficient to show the application of the general principles of design, which have been advocated in previous chapters. Nearly every building possesses some peculiarity affecting the drainage, and it is highly important that the peculiar features should be duly considered. Without careful thought on the part of the designer, and careful supervision during construction, drains will continue to be in the future, as they have been in the past, sources of annoyance, expense, and disease.

Laying Drains to the required Slopes.—It is not our intention to enter into the subject of trench digging and timbering, but something must be said about the methods of laying drains to the slopes shown or figured on the drawings. The first necessity is that accurate levels must have been taken from the drain-inlets to the point of discharge, and that the gradients of the principal drains must have been carefully calculated in accordance with those levels. To specify a minimum gradient without having ascertained that this gradient can be obtained is simply to court failure; the workman may lay the lower part of the drain to the specified slope, and may then find that the fall is nearly or altogether exhausted. The result will be that the upper part of the drain is laid nearly dead level, or (possibly) falling in the wrong direction. The calculated levels of the inverts of the drains at all changes of direction and gradient ought, in all large schemes (and in small schemes where the available fall is small), to be figured on the sections; and other levels, reduced to the same datum, must be given for various bench-marks or other fixed points near the line of the drain, so that the required depth of the drain at different places can be easily ascertained from these points by means of a straight-edge, spirit level, and measuring rod.

For long outfall drains the surveyor's level must be used for setting up sight-rails (fig. 87) at convenient distances along the line of the drain. The operation can be performed in various ways; the simplest will be explained by means of an example. Let it be required to set up sight-rails at the lower end (A) and upper end (B) of a drain 240 ft. long, the drain to be laid to a slope of 1 in 50, the reduced level of the invert at A being 40·25, and that of the nearest bench-mark 47·62. Set the level in any convenient position (fig. 88), and take a back sight to the B.M., and intermediate or fore sights to flat stones or bricks bedded solid in the ground at A and B. We will assume that the readings are as stated in the first three columns below :—

Back.	Intermediate.	Fore.	Rise.	Fall.	Reduced.	Distance.
3.69	—	—	—	—	47·62	B.M
—	2.73	—	.96	—	48·58	A.
—	—	1.28	1.45	—	50·03	B.

Reduce these levels as shown in columns four, five, and six. The required invert of the drain at A is 40·25; on subtracting this from the reduced level of the brick at A, namely, 48·58, we find that the invert of the drain must be 8·33 ft., or 8 ft. 4 in. below the brick at A. Set up the first sight-rail (say) 2 ft. 8 in. above the brick, that is to say, 11 ft. above the invert. The invert at B must be (240÷50=) 4·8 ft. above that at A; the reduced level will therefore be 40·25+4·80=45·05. The reduced level of the brick at this point is 50·03, the depth to the invert being therefore 50·03−45·05= 4·98 ft., or 4 ft. 11¾ in. The sight-rail at B must be, as at A, 11 ft. above the invert, that is to say, 5 ft. 0¾ in. above the brick at B. In a long drain it is best to fix an intermediate sight-rail, as the head of the boring-rod can then be more correctly placed in position. After the sight-rails are fixed, they should be checked by fixing the level in a convenient position and taking sights to the level staff held on the top of each rail in turn; the difference between the two readings ought to be equal to the fall of the drain between the two points—in this case 4·80 ft.

The depth from the sight-rail to the invert gives the length of boning rod required.

* Rain-water is, of course, often stored in a tank above ground. The principal rain-water pipes are run to this tank, and the others are connected to the sewage-drains.

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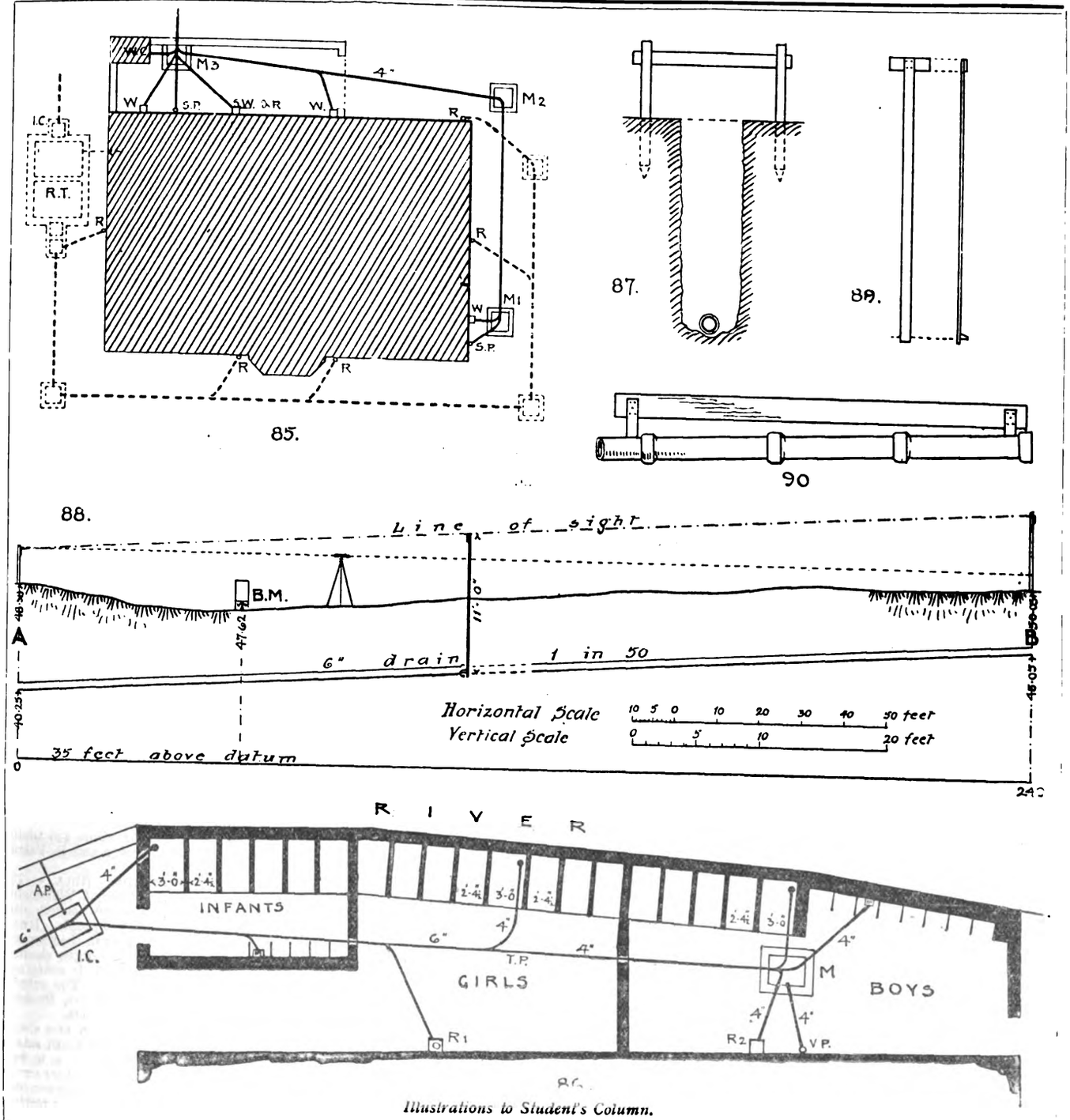

Illustrations to Student's Column.

namely (in this case) 11 ft. This rod (fig. 89) is shaped like a T-square, and has a stud or block projecting from the face at the free end of the blade, so that the block will rest on the invert of the pipe which is being laid. The method of using the sight-rails and boning-rod is shown in fig. 88. It is obvious that the line of sight between the two sight-rails is parallel to the required invert. In the example under consideration, the distance between these two parallel lines is 11 ft., and the boning-rod must therefore measure 11 ft. from the head to the shoe-block (outside to outside). After placing a drain-pipe in position, the boning-rod must be set up as shown, and the pipe must be raised or lowered until the top of the boning-rod coincides with the line of sight between the sight-rails. The pipe can then be wedged fast and the next pipe laid. As a rule, the boning-rod is used for every third or fourth pipe, and a long straight-edge is laid along the sockets to give the slope for the intermediate pipes. Sometimes, when pipes with special joints are adopted, they are jointed in pairs on the surface of the ground, and when the cement has set, the jointed pipes are lowered into the trench and laid. This method saves labour in the trench.

For short drains a simple straight-edge is used with two studs or blocks on one edge. The distance between the studs ought to be some multiple of the length of the pipe, and the thickness of the blocks ought to be such that they rest on the barrels of the pipes, the straight-edge itself being quite clear of the collars. If we have a 4-in. drain laid to a gradient of 1 in 30, with pipes 2 ft. 6 in. long (exclusive of the sockets), the distance from centre to centre of the blocks may be 7 ft. 6 in.; if the upper block is $1\frac{1}{2}$ in. thick at the centre, the thickness of the lower block must be $1\frac{1}{2}$ in. $+\left(\frac{7.5}{30} \times 12 \text{ in.}\right) = 4\frac{1}{2}$ in., as shown in fig. 90. After laying three drain-pipes, the straight-edge can be brought into use; lay the fourth pipe in position, and place the straight-edge along the crown of the pipes, so that the thinner block rests on the barrel near the collar of the fourth pipe, and the thicker block on the barrel of the first pipe. Then lay a spirit-level on the top of the straight-edge. The fourth pipe must be raised or lowered until the straight-edge is dead level. Needless to say, the straight-edge must be perfectly true and parallel, and the spirit-level must be accurate, or its inaccuracy must be corrected by reversing it, the straight-edge being finally placed so as to be a mean between the two observations.

BATTERSEA ARTISANS' DWELLINGS COMPETITION.—Mr. B. H. Tarrant writes to say that the third premiated design should have been mentioned as by "Messrs. B. H. Tarrant and J. Walker," not B. H. Tarrant alone. The mistake was not ours.

TIMBER TRADE OF SWEDEN.

REPORTS recently received at the Foreign Office from H.M. Consuls and Vice-Consuls on the eastern coast of Sweden, contain interesting information respecting the exports of wood, &c. Mr. A. Stewart MacGregor, Consul at Stockholm, writes: "The year 1901 is likely to be long remembered by those who had anything to do with the timber trade. During the first half of the year prices went down steadily, and at the beginning of the shipping season they were *l.* 5s. to *l.* 10s. below those which were ruling at the end of 1900. The fall in prices so far may be said to have been somewhat natural considering the general state of depression in the markets of the world, but there seems to have been no reason why during the summer months the market should have been seized with a panic, which caused a further decline in prices to the extent of *l.* to *l.* 10s. These latter quotations were simply ruinous to exporters. Under such circumstances the only remedy was to limit production considerably. With this object in view a meeting was held at Sundsvall on September 21, 1901, by some of the chief owners of forests, and a reduction of at least 30 per cent. of the number of trees to be cut down unanimously agreed upon. Exporters of wood in Finland also decided to limit their production 35 per cent. at least. These steps had a good effect, and almost immediately the market became more steady. During the latter part of the autumn prices rose *l.* up to *l.* 10s. per standard above the lowest quotations obtained during the summer. The total amount of wood exported from Sweden during 1901 was 903,787 St. Petersburg standards, of which about four-ninths, or 399,370 standards, went to the

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United Kingdom. These figures are about 10 per cent. below those of the previous year. It is interesting to observe that the amount sent to Australia was more than double that for the year 1900, and the quantity which went to the Cape showed also an increase of nearly one-fourth. The following were the numbers of standards shipped during 1901 to the countries named: United Kingdom, 399,376; France, 163,299; Germany, 95,619; Denmark, 69,296; Belgium, 33,750; Spain, 15,753; Holland, 61,876; Australia, 10,257; Portugal, 3,177; Cape, 31,680." From the report of Mr. Carrick, Vice-Consul at Gefle, we extract the following:—"In commenting on the trade in sawn and planed wood for the year 1900, I pointed out that it had been very prosperous during the first half of the year, but that the scarcity and dearness of tonnage had arrested sales in the latter half. Further, that the inflexible attitude assumed by Swedish shippers with regard to prices in the opening months of 1901 was likely to cause a deadlock in the trade and considerable loss on stocks in Sweden. This apprehension was fully borne out by the course of the market during 1901, although no one could anticipate such heavy losses in both the producing and consuming markets, as actually occurred. The first signs of weakness emanated from London, where the heavy import during the autumn of 1900 had caused a disastrous congestion in the principal importing docks there, a congestion which, by hindering importers from obtaining delivery of their goods, seriously compromised the position of some respectable firms. Acceptances were falling due, and to provide the means of meeting them importers were obliged to resort to the auction-room to realise available goods. The casting of immense quantities of sawn and planed wood on the London market for forced sale caused naturally a heavy fall in prices. Many large cargoes were thus sacrificed at a loss of 30s. to 3*l.* a standard during the first six months of 1901. Naturally these heavy losses in London put a stop to all further purchases from Sweden in that market, and disorganised all the other British and Continental markets. Swedish shippers having, however, disposed of a considerable quantity of wood prior to these forced sales, declined to follow the fall abroad for some time. Russian shippers, on the other hand, becoming alarmed in February, commenced to reduce their exorbitant quotations by about 10s. a standard overhead, followed by the firms and the Swedish shippers of the Upper Gulf. The lowering of prices once commenced, the market gradually gave way, reductions were made again and again until, in the month of June, many shippers were obliged to sell at the best figures obtainable. In the Gefle district the fall was probably less than in many others, and was confined more especially to the narrow dimensions of red wood. For the smaller Gefle shippers, however, the season was probably the worst experienced for twenty years. The Swedish Sawmill Owners' Society having called together the shippers, an agreement to reduce the cutting of logs for the present winter by about one-third, as compared with the logs got during winter 1900-01, has been made. This has already caused a reaction, and if the agreement can be carried out the trade will be placed on a sounder footing. On account of the partial failure of floating operations some of the larger mills have been standing idle for several months." Mr. Carrick appends a table showing the fluctuations in prices in 1900 and 1901 for the different dimensions of sawn wood in the Gefle district. Reports from other districts are of corroborative character, and Mr. Vice-Consul Burchardt writes from Hernösand: "The drop in prices during the year 1901 was considerably greater for the smaller dimensions than for deals and battens. In fact, the prices at a certain time became so low that the exporters could not produce the goods without great loss, their calculations having been based on the prices they had paid for their logs. For those who had previously bought their own forests at cheaper rates the state of business was somewhat better."

OBITUARY.

MAJOR DAVIS.—We have to announce the death on the 10th inst., at Bath, of Major Charles Edward Davis, F.S.A., who during forty years past had filled the appointment of City Architect and Surveyor of Works to the Corporation. It is mainly due to his recommendations and labours that the Corporation have placed the local bathing establishment in its former position, and many considerable improvements in both the buildings and the arrangements were effected under his advice and superintendence upon his return from a tour amongst the spas of the Continent in 1885. An enthusiastic antiquarian, Major Davis carried out an exploration, begun in 1869, of the site of the hot mineral springs and of the old King's Bath, and published a descriptive account of his discoveries. To the west of the King's Bath he found extensive remains of Roman thermal work; in 1880-1 he found the great bath, and to the west of that, in 1884-6, the circular bath; and in 1878 the great Roman well beneath the King's Bath. The hall enclosing the great bath measured 110 ft 4½ in. by 68 ft. 5 in., and the bath itself, with the steps around it, 81 ft. by 38 ft., the *schola*, or ambulatories, being 14 ft. wide. The adjoining round bath, including its range of steps, proved to be about 30 ft. in diameter, within a hall measuring 39 ft. 6 in. by 35 ft., which has since been covered over with an arched vaulted ceiling. To the south-west lay the hypocaust. The great well, discovered after the purchase of the Kingston hot springs by the Corporation, and octagonal on plan, still constitutes the principal collecting reservoir of the springs. It has a diameter of about 45 ft.; the walls are 3 ft. thick, rising to from 6 ft. to 7 ft., and were found to be lined with lead more than ½ in. thick, and weighing 30 lbs. to the square foot; a central shaft conveys the water up to the bath above. Major Davis made the plans and designs for additions to, with modern improvements of, the King's and Queen's Bath (originally the King's Bath) in Stall-street, as built in the earlier years of the sixteenth century; the new buildings, erected at a cost exceeding 20,000*l.*, were opened in June, 1889. The (old) Queen's Bath, constructed in 1597, and named after King James I.'s consort, was removed in the course of excavations made in 1885-7. Major Davis planned and designed upon an extensive scale the new Queen's Baths begun in July, 1886, and opened on June 13, 1889, by the Duchess of Albany, in Stall and York streets; the two fronts are after the Italian style, with Ionic pilasters carrying a deep cornice and an attic story; the central hall has an open timber roof, and disposed around it are Aix douches, an inhalation-room, Ragatz reclining-rooms, and similar accessory apartments. Major Davis enjoyed an extensive private practice, whilst the knowledge he possessed of the medical application and remedial uses of natural mineral waters was often in requisition at the provincial spas and watering-places of our own country. He was the architect of the Empire Hotel, in Orange-grove, Bath, erected for Messrs. Spiers & Pond at an expenditure of about 50,000*l.*, and opened in last December. His successful restoration of the early Christian church at Northstoke, formerly a cell of Bath Abbey, is described in our columns of September 22, 1888. He also carried out the restoration and re-roofing of St. Thomas à Becket church at Widcombe, the oldest church in Bath. He laid out the Royal Victoria Park, fifty acres, first opened on October 23, 1830, by the Princess Victoria and her mother the Duchess of Kent, and designed, in the fourteenth century style, the two chapels with their cloistered carriage-way and middle turret carrying a slender spire for the cemetery that was opened, 1862, in the Lower Bristol-road, for the parishes of St. James's, Widcombe, and Lyncombe.

GENERAL BUILDING NEWS.

CHURCH OF ST. GEORGE THE MARTYR, HOLBORN.—This church has recently been reopened after a general repair of the fabric. Standing on the west side of Queen-square, it was originally built in 1706 as a chapel-of-ease to the parish church of St. Andrew, Holborn, and consecrated as a parish church on September 26, 1723. The edifice was entirely remodelled, after the Byzantine mode, in 1868-9, by S. S. Teulon. Its dedication to St. George is due to the circumstance that Sir George Streynsham, who largely contributed to the building of the chapel-of-ease, had been Governor of Fort St. George at Madras. The church will be remembered by readers of Thackeray's "Adventures of Philip." Dr. Stukeley, the antiquarian, was rector during many years.

THE PARISH CHURCH, CLAPHAM.—We understand that Messrs. Garrett & Sons have been appointed contractors for the general reparation of the (later) parish church at Clapham Common, together with the erection of a new chancel at an expenditure of about 7,500*l.*, under the directions and superintendence of Professor Beresford Pite. The church, dedicated to the Holy Trinity, was built in 1775-6 after the typical "George III." style, at a cost of 11,000*l.* The reseating and considerable alterations of the interior were carried out in 1875 by the late Sir Arthur Blomfield. The organ (since enlarged) was built in 1845 by Bishop. The Church of St. Paul, in Larkhall-rise, was built in 1814 on the site of what had been the original parish church, which contained several interesting monuments, described and illustrated in the *Builder* of January 2, March 20, and May 8, 1886.

WESLEYAN METHODIST CHURCH, KING'S NORTON.—A new Wesleyan church was opened on the 7th inst. at King's Norton. The building is brick, with York stone dressings, and the roofs are covered with green Westmoreland slates. The roofs are of open timber, with felt laid thereon. The windows consist of stone mullions, and tracery filled in with leaded lights. The plan of the church consists of nave, with aisles divided from the same with three granite columns upon each side. The floors are laid with pitch-pine blocks, with a gradient towards the pulpit. The main entrance porch consists of stone archway, with pinnacles and pediments. This gives access to lobbies, in each of which are hung two swing doors. A similar and separate entrance, situated in the tower and immediately adjoining, gives access to the gallery by a staircase. A tower and spire rise to a height of about 80 ft. The present accommodation is for 480 persons. Provision is made for further sittings, &c., by the addition of transepts and chancel. A ladies' parlour and ministers' vestry, with lavatory accommodation, are now provided. A proposed lecture-hall and additional vestries are held over for future erection. The total cost will be about 4,200*l.* The architects are Messrs. Ewen Harper & Brother, Birmingham. The builders are Messrs. J. Harley & Son, Smethwick.

CHURCH, CHARLEVILLE, IRELAND.—The new Church of the Holy Cross has just been dedicated at Charleville. The style of the church is Gothic, and the building has been erected from designs by Mr. M. A. Hennessy, architect, Cork. The contractor was Mr. Denis Creedon, Fermoy. The dimensions of the interior of the church are as follows: Length of nave and chancel, 136 ft.; breadth across nave and aisles, 60 ft.; breadth across transepts, 80 ft.; width of transept, 30 ft.; depth of chancel, 24 ft.; breadth of chancel, 27½ ft.; side chapels, 13 ft. square; the height to apex of nave is 60 ft.; to wall plate 40 ft.; to apex chancel, 52 ft.; to transept, 52 ft.; to wall plate transept, 35 ft. The height of this tower and spire will be, above ground level, 150 ft. The church is built with limestone from the local quarries. The chancel window shows a representation of the "Exaltation of the Holy Cross." The Lady Chapel and the Chapel of the Sacred Heart also contain each a stained glass window. The gables of the side chapels are lighted with windows of stained glass. The main arcade dividing the nave from the aisles is one of the principal features of the interior of the church. It is formed of six bays on each side, and has massive pillars with moulded bases and caps of limestone, and marble shafts of Cork polished red marble. The high altar is formed of Carrara marble, with coloured shafts. The high altar was built by Mr. Edmond Sharpe, of Dublin, and the altar rails and steps by Messrs. Earley; and the silver lamp for the sanctuary was manufactured by Messrs. Kane & Gunning, of Dublin.

SOUTH CLIFF CONGREGATIONAL CHURCH, LOWESTOFT.—The foundation stone of this church was laid on the 8th inst. The church consists of nave and double transepts, the latter only being at present erected, projecting a few feet; these, however, can at any time—when extension is found necessary—be extended or increased in depth so as to provide considerably larger accommodation (about 180 extra). The facings are of red brick and the dressings of white Costessey work. The roofs are open timber construction of the hammer beam type. The seating is to be of oak. A square tower with angular pilasters, and terminating with a lead covered spirelet and weather-vane form a feature of the design. The contract is let to Mr. John Ashby, Lowestoft, and amounts to 1,698*l.* The accommodation of the building will be about 430 adults. The architects are Messrs. George and R. Palmer Baines, Strand, London.

ST. SAVIOUR'S, WILMINGTON, HULL.—The foundation stone of a new church at Wilmington was laid on the 8th inst. The new church will, when completed, accommodate 700 people. It consists of nave and aisles, chancel, organ chamber, and vestries. The nave and aisles and organ chamber are completed so far as the shell is concerned, and the chancel is yet to be built. The exterior of the church is of red brick. Messrs. Brodrick, Lowther, and Walker, are the architects.

CHURCH, ABERDEEN.—A site for a new church has recently been acquired on the south side of Skene-terrace, Aberdeen. The building is to have sitting accommodation on the ground floor for 185 persons, and a small end gallery will accommodate forty-five additional. The pulpit will be a platform one, with a baptistry situated immediately behind it. In addition to the church accommodation, there are to be two retiring-rooms and a classroom. The church is Gothic in character. Messrs. D. & J. R. M'Millan, Aberdeen, are the architects.

RESTORATION OF CORBY CHURCH, NORTHAMPTONSHIRE.—This building has just been reopened after restoration. The contract was given to Mr. S. F. Halliday, of Stamford, and the architect was Mr. J. C. Trayler, of Stamford. A new north aisle has been erected in place of the old gallery, and where the old north wall stood are three arches, with octagonal pillars, the three windows formerly here being replaced in the new north wall. In the chancel a new carved oak roof replaces the former one, with carved bosses (bearing emblems of the Passion), panelled work, and cornices. The old plaster was taken off, and the whole replastered, the arch cut through the wall of founder's tomb filled in, the windows taken out, the glass being recut and releaded; new oak clergy and choir stalls were placed in the chancel, and the flooring of the chancel was laid in mosaic work. The Communion table is of carved oak. The chancel lamp of 60 candle-power is of solid brass, with brass suspenders; there are two brass standard lamps in the sanctuary. The Communion rail, with centre open space, is of carved oak, polished, supported on four brass foliated standards. The chancel arch was practically rebuilt, and the chancel seats are separated from the chancel steps by an oak base of a future screen, with some of the ancient carved work of a former screen replaced. The chancel steps are all of newly carved Robin Hood stone. The nave roof is of carved oak with panel work, with trefoil carved heads above the principals, from which depend the chains for lamps in wrought-iron links, with brass

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rings and bosses alternately. The aisles have been paved with Robin Hood and Ketton stone in diamond pattern, and the floor under the pews is laid in wood blocks. New lamps, with brass receivers and iron and brass chains, have been put up in the nave and aisles. In the south aisle a new porch has been erected inside the south door, with battlemented moulding and stained-glass east window inlet in panel. The pulpit is of stone, with alabaster top moulding, and in the central panel of octagon a canopied niche, in which is a figure of St. John the Baptist, carved in alabaster. The whole of the roofs have been covered with new sheet lead, and have new pipes to carry off rain, the base of the walls of the church being protected by an ashlar cement drain. It was not considered necessary to take down the tower and spire, but to prevent further movement the walls have been underpinned, a new buttress added, and the stonework restored and renewed.

MALMESBURY AND DISTRICT TECHNICAL AND SECONDARY SCHOOL.—The foundation-stone of this building was laid on Thursday, the 8th inst., by the Mayor of Malmesbury, Mr. William Forrester. The contract for the building, exclusive of fittings and cost of land, is 3,833*l.*, the contractors being Messrs. Smith & Light, of Chippenham, Wilts, and the architect Mr. Robert E. Brinkworth, of Bath and Chippenham.

NEW BARRACKS, MILLBANK.—The new barracks which have been built for the Army Service Corps were taken over in the course of last week by a detachment of that corps. The buildings cover a total area of about four acres of the site of the former prison. The main block, facing the river, contains quarters having two, three, and four roomed suites, with scullery, &c., for thirty-four married men, whilst eighty-four single men will occupy the return block—which comprises stabling for thirty-six horses, with rooms for harness, carts, forage, and stores—along the side of the parade ground. Electric light is supplied throughout the canteen, guardhouse, shops, and quarters, and the most modern appliances for sanitation and ventilation have been adopted.

ROWTON HOUSE, BIRMINGHAM.—A Rowton House is to be erected in Birmingham. It is to occupy a site at the corner of Alcester and Moseley streets of 4,000 sq. yds., and to overlook Highgate Park. Its accommodation is to include a dining-room, 100 ft. by 60 ft., and reading, writing, and smoking rooms. A disused malt house and a number of other old buildings are to be pulled down to make room, and it is expected that building operations will be well advanced before the summer is over. Mr. H. B. Measures, of Westminster, is the architect.

DRILL-HALL, NEWPORT.—The premises of the headquarter companies of the 4th Volunteer Battalion South Wales Borderers at Newport have just been completed. The old hall has been increased by about a third in size, and now affords an area of 4,060 sq. ft.—sufficient to mass and move about 500 men on the concrete floor. There are also on the ground floor two armouries, with separate doors, and the orderly-room. The first floor is devoted to officers' rooms and quartermaster's department, reached by a balcony overlooking the hall; the second floor to a sergeants' messroom, men's recreation-room, and bandroom; whilst on the third floor storage accommodation and a buglers' practising-room are provided. There is a fireproof staircase and a lift for conveying the stores. The basement is for the ammunition magazine and lavatories. Electric light is fitted all through. Mr. T. Westacott has carried out the work (the cost being about 2,500*l.*) from the designs of Messrs. Habershon, Fawckner, & Groves, architects.

EXTENSION OF UNIVERSITY COLLEGE, LIVERPOOL.—A block of botanical laboratories, presented to Liverpool College by Mr. W. P. Hartley, of Aintree, and situate in Brownlow-street, has just been completed. The new botanical institute occupies a site of about 3,000 sq. ft., with a frontage of 35 ft. to Brownlow-street and 85 ft. to Dansie-street. The architect was Mr. F. W. Dixon, of Manchester, and Professor Harvey Gibson collaborated in the preparation of the plans. Corridors have been entirely eliminated, all the apartments opening off a central hall and one main staircase. The basement is divided into four parts as a storeroom, heating-chamber, lavatories, and coal stores, while the ground floor contains a workshop, a museum preparation-room, and a museum, which is approached direct from the entrance in Brownlow-street. The museum is 45 ft. long, 34 ft. wide, and 22 ft. high, and is equally divided into an upper and lower section by means of a gallery which has been placed at a height of 11 ft. A spiral staircase communicates with the gallery, and it is also reached from the first floor. The lower portion of the museum will be open to the public during college hours. Another department of the new building is the herbarium, located on the first floor. Here are stored about 100,000 dried herbs. Storage is provided for quite 200,000 plants. Adjoining the herbarium is a classroom for advanced students, the library, the professor's private laboratory and office, and a lecture theatre. The latter is seated for 150 students, and, when necessary, accommodation could be found for over 200. The top story of the buildings is occupied by five rooms, a research experimental physiology laboratory, with dark-room attached, an anatomical research laboratory, advanced and elementary laboratories, and a demonstrator's private room. Sixty-five students can operate simultaneously in the elementary and twelve in the advanced laboratory. A small greenhouse on the roof will be used for aquaria and plants for physiological experiments. Throughout, the building is lighted with electricity, the woodwork is pitch pine, and ventilation is provided by electric fans.

UNION OFFICES, ECCLESALL, YORKSHIRE.—New offices for the Ecclesall Board of Guardians are to be erected on a plot of land in Union-road facing the workhouse. Competitive designs were asked for by the Guardians from a number of local architects, and the design adopted is that of Messrs. Ellis Bros. The building will be two stories in height, and will comprise two blocks—one facing Union-road, the other running at right angles from the centre of this block back towards Barker's-road. In the first block the Guardians and their clerical staff will be accommodated; the other section will be for the use of the relieving officers. Externally the buildings will be of stone; internally the entrance halls, passages, and landings will have dados of glazed bricks. The floors will be of wood blocks. It is estimated that the new offices will cost 7,000*l.* exclusive of furniture.

SUNDAY SCHOOLS, HECKMONDWIKE.—The memorial-stones of the St. Saviour's Church Sunday Schools, Heckmondwike, were laid recently. There will be four classrooms in the frontage, the two in the centre being separated from the others by the two entrances to the schools. Behind these there will be the central hall, 60 ft. by 29 ft., and the heating apparatus at the rear. Four other rooms will be built, two on each side of the forepart of the central hall, three of which will be used as classrooms. These comprise the main features of the present scheme, which is estimated to cost 1,200*l.* Mr. Henry Stead, Heckmondwike, is the architect, and the following are the contractors:—Mr. J. B. Allatt, mason; Messrs. J. Richardson & Sons, joiners; Mr. J. B. Greenwood, plasterer: Mr. James Gledhill, plumber; Messrs. J. M. Thornton & Sons, slaters; and Mr. Joseph Taylor, Northgate, Heckmondwike, painter.

BANK OF SCOTLAND PREMISES, PERTH.—The new offices of the Royal Bank of Scotland, in High-street and Kinnoull-street, occupy a site at the corner of the new street. The bank premises are in the corner, and there are three shops in Kinnoull-street and a number of dwelling-houses and offices in the three flats above. The work has been designed and carried out under the personal superintendence of Mr. David Smart, architect, Perth.

HOSPITAL EXTENSION, SHEFFIELD.—To comply with the condition of the Local Government Board a separate hospital has been built at Crimicar-lane, Sheffield, which can be used for the treatment of smallpox cases, or, when not required for that, for the care of scarlet fever patients. It is anticipated that this hospital will be ready for use in three months' time. Only four acres of the land will be taken up by the buildings now in progress, which consist of an administrative block, ward pavilion, isolation wards, laundry, mortuary, and ambulance block, and lodge and discharging block. The plans have been prepared by Mr. C. F. Wike, the City Surveyor. In accordance with the resolutions of the City Council the contract was let in September, 1900, for the construction of the hospital to Mr. J. Fidler, of Eckington and Sheffield. The possibility that future extensions may be necessary has been considered, and the scheme provides for the erection of three more ward pavilions when desired. The cost of the hospital will be about 18,000*l.* The buildings are surrounded with a stone wall from 6 ft. to 7 ft. in height. In the centre of the ground is the administration block, a three-storied building. It contains the medical officer's residence, surgery, bedrooms, sitting-rooms, &c., for matron and thirteen nurses; hall, cubicles, kitchens, &c., for ten servants. Adjacent to this is the ward pavilion, a one-story building, divided into a men's ward with twelve beds; a women's ward with twelve beds; and two private wards. In addition there are baths and conveniences. The floors are laid with mosaic. In the isolation block are four small wards with accommodation for two nurses. The laundry contains disinfecting-rooms, boiler-house, and washhouse, &c. In addition there are a lodge and discharging-block, and the mortuary and the ambulance-shed. Extensions have also been made at the Lodgemoor Infectious Diseases Hospital, which is about four and a quarter miles from the centre of the city. The old buildings, erected in great haste during the small-pox epidemic, in the winter of 1887, are of wood, with the roofs covered with slates. They consist of twelve pavilions designed for ten beds each, but some of the pavilions have been temporarily occupied for administrative purposes, and the whole 120 beds will only be available when the new administrative block is complete. Some additions were made to the hospital in 1892, including a lodge, waiting-room, and laundry building. The new permanent buildings, which are in the course of erection, are of stone, lined with brick, and will, it is estimated, cost 82,346*l.* They include a waiting shed for visitors to patients; a water tower, with tank, to hold 12,000 gallons, the lower stories utilised as living and bed-rooms for porters; a pavilion for receiving patients, with a bathroom, &c.; two pavilions, with four separate wards for two beds each, for the isolation of special cases, each pavilion having its kitchen and complete set of sanitary blocks and recreation ground; six pavilions, each with large ward 120 ft. long, and 26 ft. wide, for twenty patients; separate wards, for one and two beds, with kitchen and sanitary blocks, and with a recreation ground; a covered recreation ground; administrative buildings at the front, consisting of entrance hall and office, with sitting and bedrooms for medical officer and his assistants, and sitting and bedrooms for matron, administrative buildings at the back, consisting of tradesman's goods receiving room, with matron's office, cooks' pantries, dining-rooms, kitchens, &c.; dispensary and laboratory; nurses' home, with rooms for sixty-six beds and three sitting-rooms for the nurses with movable partitions; maids' home with cubicles for sixty beds, with two sitting-rooms with movable partition, and sitting and bedroom for the assistant matron; store for patients' hospital clothing and sewing-room; covered boiler-house with two steam boilers, each 30 ft. by 7 ft. diameter; stable building for five horses and ambulance shed, with coachman's house above; mortuary. Including the temporary buildings, the total accommodation is for 260 patients, and with the staff, for about 410 persons. The buildings will be heated with hot water, and the lighting is by gas. The plans were designed by Messrs. Gibbs & Flockton, of Sheffield; and Mr. T. Roper, of Sheffield, was the contractor.—*Sheffield Independent.*

HIGH PEAK ISOLATION HOSPITAL.—At Chinley on the 1st inst. new buildings that have been erected to receive cases of infectious disease in the area comprising the rural districts of Chapel-en-le-Frith and Hayfield and the urban districts of New Mills and Fairfield were opened. The hospital is situated about a mile from Chinley, and the same distance from Chapel-en-le-Frith, close to the main road. The premises consist of four separate blocks of buildings, No. 1 being the administrative block. This is a stone building partly one-story and partly two-stories high. Attached to this building is the discharge block, consisting of three small rooms, viz., waiting-room, bathroom, and change room. No. 2 is the large pavilion block, capable of holding twelve beds, and consists of porch, two wards, attendants' room, with heating cellar under. A verandah extends along the south front of this block. No. 3 is the lesser ward block, and consists of nurses' duty room and two wards capable of holding four beds. In this block also there is a heating cellar under the nurses' duty room. No. 4 is the laundry, mortuary, and stable block. The contractors were Messrs. Scattergood & Warrington, New Mills; and Mr. W. R. Bryden, of Buxton, was the architect. The cost up to the present is about 13,000*l.*

KIRKCALDY DISTRICT HOSPITAL.—The Kirkcaldy District Joint Infectious Diseases Hospital, erected on a site off Strathore-road, near Thornton, has just been opened for the reception of scarlet fever patients. Competitive plans were asked for the buildings, and the District Committee, acting on the advice of Mr. Morham, architect, Edinburgh, selected those of Messrs. Fryers & Penman, architects, Largs. The buildings consist of an administrative block, attached to which is the observation ward; scarlet fever block; typhoid block; diphtheria block; and block containing heating apparatus, washing-house, disinfecting chamber, mortuary, &c. The hospital has accommodation for about thirty patients.

HOSPITAL, DUNDEE.—Mr. J. K. Caird, manufacturer, Dundee, has offered to provide a hospital in connexion with Dundee Royal Infirmary for the treatment and investigation of cancerous disease, at an estimated outlay of 23,500*l.* The building will be constructed on the pavilion system—one pavilion on each side of a central block, connected with it by ventilated passages. On the north side of this central block is the main staircase, in the well of which is placed an elevator, and opening on to the platform of the staircase, about the level of the first floor, is an entrance from the north boundary of the infirmary grounds. On the south side of the main block are arranged, on the various floors, the entrance, dayrooms for patients, and an operation-room. Adjoining the operation-room are anæsthetising and sterilising rooms. Running east and west from the centre building are cross ventilated corridors corresponding to the different wards. At their further ends these corridors open into the entrance proper to the wards, and in this part of each unit will be placed the ward kitchen, the medical officer's room—which will serve the purpose of a ward laboratory as well—a dining-room for convalescent patients, rooms for linen and for patients' clothing, ward-maids' pantry, and two single-bedded wards for paying or other patients whom it may be desirable to keep apart. Next the ward is the way leading to the sanitary annexe, in which are the bathroom, sinks, &c., entirely cut off from the main building, except by a short passage with windows on both sides. The wards are to contain room for sixteen to twenty beds. At the end is a verandah, and an outside stair at this point will be available in case of emergency.—The upper part of the building is devoted to bedrooms and other accommodation for the nurses—twenty-eight in all. Lighting will be by

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electricity, and heating by steam-pipes and radiators. The architect is Mr. James Findlay, Dundee.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, DYFFRYN.—The Dolgelly Rural District Council have adopted the scheme of water supply for Dyffryn prepared by Mr. Harry W. Taylor, A.M.Inst.C.E., of Newcastle-on-Tyne and Birmingham, and application to the Local Government Board for borrowing powers will be made at once. The water will be taken from springs, and will gravitate into the village.

NEW BRIDGE, CORK.—On the 7th inst. his Royal Highness the Duke of Connaught opened the bridge on the new thoroughfare which crosses the Lee and connects the College-road with the main western entrance to Cork. This new road, which will henceforth be known as Fernhurst-avenue, opens up a new suburb of the city, and one in which many villa residences and pretty terraces have already been built. The bridge spans the river near the entrance to the Queen's College. The plans were prepared by Messrs. W. H. Hill & Son, Cork; and the contract was carried out by Mr. Patrick Murphy.

STAINED GLASS AND DECORATION.

THE KING'S MEMORIAL TO QUEEN VICTORIA.—The King has placed a stained glass window in the private chapel at Windsor Castle as a memorial of her late Majesty. The window consists of ten lights in two tiers above the altar. In the centre openings of the lower tier are depicted the Crucifixion. In the right-hand light stands the Virgin Mary, and in the other light St. John the Evangelist. In the two outer lights of the lower tier are angels, holding shields charged with emblems of the Passion. The Resurrection is represented in the three centre lights of the upper tier. In the centre Christ is stepping from an open tomb, and on either side is an angel, one holding back the stone, while around are Roman soldiers. In the two outer lights are angels, holding musical instruments. The window is the work of Mr. J. Pace. A tablet, designed by Mr. Nutt, architect at Windsor Castle, has been affixed to the oak panel work near the window.

MEMORIAL WINDOWS, COLEY PARISH CHURCH, HALIFAX.—Three new memorial windows have just been unveiled and dedicated in this church. The work has been done by Messrs. Heaton, Butler, & Bayne, of London.

FOREIGN.

FRANCE.—The exhibition of wood-engraving was opened last week at the Ecole des Beaux-Arts. The historical section includes some valuable proofs of old engravings bearing the signature of Jean de Dale, an engraver at Lyons, in the fifteenth century. The "Dévotes Meditations de Saint Bonaventure," illustrated by Italian engravings executed in 1487, and the engravings by Albert Durer and Lutzelberger, are among other attractions of the exhibition. Modern engraving, from the Renaissance to the present day, is very well represented, and the exhibition is all the more interesting owing to the manner in which this fine art has been almost driven out by photography and photographic "processes."——Various churches in Paris are to undergo extensive repairs; the Madeleine first, at a cost of 400,000 francs.——The Sèvres fountain, placed in the Cours la Reine at the time of the 1900 exhibition, is now to be re-erected in the garden of the Galliera Museum.—— The Carnavalet Museum at Paris has just acquired a model of the first design for the Bourse by Brougniart, the original architect. It shows that the building was at first intended to have an Ionic order, instead of the present Corinthian one.——The demolition of the fortifications of Brest is soon to be commenced, but they are to be replaced by a fortified *enceinte* on modern lines.——A new system of railway lines is to be commenced in the Department of Morbihan, comprising a line from Pontivy to Naizin; one from Meslan to Pontivy; and one from Nivino to Gourni. The whole cost will be 8,000,000 francs.——The death is announced of a veteran sculptor, Félix Chabaud, at the age of 78. He obtained in 1848 the Prix de Rome for engraving, but afterwards studied sculpture under Ramus and Pradier. Besides executing a good many separate works exhibited at the Salons from time to time, he took part in the decorative sculpture of the Paris Opéra House, of the Prefecture of Marseilles and the Palais de Justice and Museum of the same city; and he modelled the statue representing "Agriculture" which decorates the monumental fountain at Aix in Provence.

PROJECTED TUNNELS UNDER RIVERS IN NEW YORK.—Sir P. Sanderson, British Consul-General, writes to the Secretary of State for Foreign Affairs:—Plans have been made for the junction of the Pennsylvania and Long Island railroads, with a central station in the centre of New York proper, by means of tunnels under the North and East Rivers. These tunnels under the North River will be of a novel construction, being, in fact, bridges enclosed in steel tubes, and supported on piers reaching down to bed-rock, the reason for adopting this peculiar construction being the character of the river bed. For some feet below the surface the bed is of soft mud, then sand and clay formations extend down from 70 to 100 ft. before the rock is reached, and a tunnel bored through this sand and clay would not be considered safe. The steel tubes are to be 18 ft. 6 in. in diameter, and the motive power of the trains will be electricity. The tunnels under the East River are more easily constructed, as the bottom is all solid rock. It is estimated that the tunnels under both rivers can be constructed in about three years.

THE BUILDING TRADE OF BAVARIA.—Mr. John Ford, his Majesty's Charge d'Affaires at Munich, in his annual report, states that after a long period of commercial prosperity a reaction began towards the end of 1900, and increased during 1901. A crisis, starting with the Spielhagen banks in Berlin, the bank at Leipzig, and other prominent banks spread over the whole empire. The building trade was one of the first to be affected by the dearness of money, especially in Munich, where, during the last few years of commercial prosperity, entirely new quarters have been built. It has been customary to take a mortgage on a house long before its completion, but the banks now refuse to lend money before the house has been entirely built. Building has, in consequence, suffered a severe check, and in the new northern quarters of the town may be seen houses built up to the ground or first floors, and then abandoned. Building material has gone down nearly 50 per cent. In 1899, 1,000 bricks were quoted at *l.* 10*s.*; in 1900, *l.* 5*s.*; and the same quantity may now be had for 18*s.*, and this in spite of a rise of 90 per cent. in Bohemian coal and 33 per cent. in Bavarian coal. There was, however, a slight rise in the wages of masons. Most of the brickmakers throughout Bavaria are Italians, and are paid from 2*l.* 10*s.* to 3*l.* 10*s.* a month. Board (consisting of polenta and cheese) and lodgings are provided.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—The Positive Organ Company have changed their address to 17, Harewood-place, Hanover-square, W.

THE CONSISTORY COURT, LONDON.—Sitting in the Consistory Court at St. Paul's last Friday week the Chancellor of the Diocese, Dr. T. H. Tristram, K.C., granted a faculty for the erection of an outdoor pulpit at St. James's Church, Piccadilly—a gift of one of the churchwardens. The pulpit will be built of stone, with a wooden roof against the north wall of the church. In a "Note" of June 15 last year, we described the other similar pulpits that have recently been erected in London churches, namely, Holy Trinity, Marylebone-road, Christ Church, Spitalfields, St. Mary Matfelon, Whitechapel, and St. Bartholomew, Bethnal Green. The Court also agreed to the issue of other faculties, respectively, for the addition of a side-chapel, with a screen and a holy table, to Holy Trinity Church in Clarence-road, Kentish Town, built in 1849-50, from designs by Wyatt and Brandon; for the sale to the Hornsey District Council of a portion of the land belonging to Holy Innocents Church (Sir Arthur Blomfield, architect), for a widening of Tottenham-lane; and for the provision of free-seating in St. James's Church, Muswell-hill, in view of the fact that a subscriber has offered 1,000*l.* towards the rebuilding fund on condition of 250 free and unappropriated seats being supplied. The church was erected in 1841-2 after plans and designs by Angell, and was enlarged twenty-eight years ago.

HOUSING OF THE WORKING CLASSES.—A Joint Committee of the two Houses of Parliament on the housing of the working classes opened on the 9th inst. the hearing of evidence. The Committee has been appointed to consider the Standing Orders of Parliament on the subject, and to report whether any amendments were required in order better to secure the rehousing of all persons of the labouring class displaced in connexion with railway and other undertakings. The Earl of Camperdown presided, and the other members of the Committee are Earl Carrington, Viscount Hampden, Lords Hatherton, Wenlock, Sandhurst, and Lamington, Mr. Jesse Collings, Mr. Bond, Mr. Crean, Mr. Claude Hay, Mr. Kearley, Dr. Macnamara, and Sir John Tuke. Mr. C. E. Troup, C.B., principal clerk of the Parliamentary and Industrial Department of the Home Office, gave a short *resumé* of the history and provisions of the various Standing Orders of Parliament bearing on the subject of reference. The rehousing requirement only applied, in the case of London, if twenty or more houses inhabited by the working classes were taken. If only nineteen houses were taken within one local area then nothing was done. The local area originally was one parish; that had now been extended to each metropolitan borough. The rehousing requirement was evaded, for example, by companies purchasing not actual houses, but sites which had been cleared away before the company appeared on the scene. He suggested the introduction into the model clause of the words "any houses or sites of houses." Railway companies could not in theory acquire houses or lands except under statutory powers, but as a matter of fact they did. Another way in which the law was evaded was by breaking up a scheme, taking say fifteen houses in one section and fifteen in another, and so neither Bill would contain an obligation to rehouse. He thought it might be possible to meet such cases by making the obligation on the company to cover all future purchases by them. In answer to Lord Lamington, the witness said he did not think his suggestion would hamper enterprise more than the whole clause did. The witness further suggested that the plans and statement of the number of persons to be displaced should be deposited with the Local Authority as well as with the Home Office. The Home Office were always glad to have the co-operation of the Local Authority. It was a question also whether more latitude might not be given to the railway companies by allowing them, for example, to rehouse some miles out in the country, and he put in some figures showing the extent to which it might be possible to relieve the congestion in London, by the removal of factories to the country. The number of factories in London employing more than 100 persons each was 748. The total number employed in these factories was 200,000, representing a population, approximately, of 600,000. In such trades as bread and biscuit making, cabinet-making, fruit-preserving, bookbinding, and printing (apart from newspapers), there was already a considerable tendency to remove to the country. Part of the arrangement, he suggested, might be that the company should not be required in such a case to rehouse so many people. It would have to be an arrangement sanctioned by the Secretary of State.

APPOINTMENT OF SANITARY INSPECTORS.—The Local Government Board has sanctioned the appointment or re-appointment of the following sanitary inspectors, viz.:—Messrs. W. E. Down and W. C. Kelland in the City of London; Mr. A. E. Powell in Finsbury, Mr. G. Fisher in Greenwich, Messrs. A. Bennett and W. Freeman in Holborn; Messrs. G. Russell, B. Nurcombe, E. B. Kershaw, S. Crane, W. G. Crabbe, S. C. G. Fairchild, A. J. Weeks, and C. Hatton in Wandsworth.

BUILDERS' BENEVOLENT INSTITUTION.—Major Brutton, who has recently retired from the secretaryship of this Institution, joined the Royal Marines in 1853, went out to the Crimea in 1854, and served in the war with Russia until peace was proclaimed; he served also in North America, West Indies, Brazil, River Plate, &c., and after twenty-two years' service retired in 1875 with the rank of Major. In 1875 he was appointed secretary of the Builders' Benevolent Institution, and acted in that capacity for twenty-seven years, relinquishing his appointment on March 15 last, in consequence of bad health. He did much good work for this most deserving charity, and took away with him the respect and regard of all connected with this Institution.

LONDON COUNTY COUNCIL TRAMS.—The Commons Committee, presided over by Mr. H. Hobhouse, resumed the consideration of the London County Council (Tramways and Improvement) Bill on the 14th inst., when the case against the projected tramway from Camberwell Green to Dulwich and Lordship-lane was proceeded with. The Chairman's decision was as follows:—We have decided to pass the preamble of the Bill for the line from Hammersmith to Putney, and the line from Camberwell to Dulwich, subject to a clause carrying out an arrangement at Lower Richmond-road (for widening). We strike out the clause empowering the Lambeth and Deptford Councils to contribute to the cost of widenings. The line from Woolwich to Eltham, I understand, has become unopposed.

GARDEN CITIES.—Under the auspices of the Garden City Association a public meeting will be held in the Crown Room, Holborn Restaurant, on Monday, June 2. The chair will be taken by the Right Hon. Earl Grey. The meeting will be held to consider how far congestion and overcrowding in large cities can be relieved by a concerted movement of manufacturers, co-operators, and others to new areas, on which arrangements will be made for securing to the migrating people the whole of the increased value which their presence gives to the sites.

BOARD SCHOOLS WORK.—The annual exhibition of work executed in the Board schools of London will be held at the Examination Hall, Victoria Embankment (adjoining Waterloo Bridge), on Wednesday, June 18, 1902, and the three following days. The exhibition will include specimens of drawings, colourwork, modelling, woodwork, wood-carving, metalwork, needlework, infants' work, cookery, laundrywork, housewifery, from the day and evening schools; work from the schools for the blind, deaf, and special instruction; and also work from the truant and industrial schools. There will also be included scientific apparatus which has been constructed by the teachers and pupils.

ISOLATION HOSPITAL, BEDFORD.—Messrs. E. H. Shorland & Brother ask us to mention that the wards in the above hospital, described on p. 481 *ante*, are warmed and ventilated by their patent Manchester stoves and grates.

LAND AND BUILDING AFFAIRS IN CHICAGO.—Much interesting information on this subject is to be found in the annual Report, just to hand, of Mr. Wyndham, the British Vice-Consul. We gather from the document in question that the market for real estate in the business district improved considerably in 1901. The demand for residential property has also increased, but not many sales in the latter have been made, owing to the great

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divergence of ideas of value between owners and buyers. Sales have been made in the business district as high as 3,404*l.* 4s. 6d. per foot frontage, or 32*l.* 10s. 0d. per square foot. Several large pieces of property have also been let for ninety-nine years at a good rent, and with the undertaking by the lessees to erect modern buildings. Many investments which were formerly in great demand now pay such low interest that investors are again turning to real estate. The growth of Chicago is so continual and steady, both as a residential and manufacturing city, that people—even those who have hitherto been doubtful as to Chicago's future, and who had therefore put their money into real estate in other States—realise that investments in Chicago, either in land or in mortgages on first-class business property, are as good and certain as any can possibly be. There is an ordinance limiting the height of buildings unless a special permit is granted by the City Council, but it is expected that this will be repealed, and that the height will be absolutely limited to about 260 ft. or sixteen stories. The property owners claim that land in the business district is so dear and the taxes on it so heavy, that buildings of less than fourteen or sixteen stories do not pay. The retail business of Chicago is about equally divided between the ten large departmental stores in the centre of the city (all on State-street and within one half-mile) and the small stores, each of the latter dealing in a single class of goods, scattered throughout the city; but it is expected that the business of the outlying districts will be done more in those districts as the centre of the city becomes more crowded, and that a better demand will spring up for property on the streets suited for business near the residential quarters. Much European capital, both of companies and individuals, is invested in the city. The building trade in 1901 had its best year since the World's Fair in 1893. The city was then overbuilt, but it seems probable that henceforward building will increase annually only in proportion to the increase of population. In house-building the chief demand has been for small houses, costing from 200*l.* to 400*l.*—generally wooden-frame houses in the outlying parts of the city. About 2,500,000*l.* has been invested in apartment or flat buildings, as there is among all classes an increasing demand for apartments in the place of houses, on account of servants' wages, cost of heating, and other expenses inseparable from the maintenance of a complete house. Rents vary from 6*l.* per month for a flat of four to seven rooms in the outlying districts to from 8*l.* to 14*l.* nearer the city centre, while ten-room flats in very desirable situations and with all modern improvements let as high as 68*l.* per month. One hundred and ten permits for building factories at an expenditure of 1,000,000*l.* were issued during the year 1901, nearly half of these subsequent to September 1. In the business portions of the city many permits were issued for buildings, to cost from 23,000*l.* to 200,000*l.* each, while two buildings, to cost 400,000*l.* and 240,000*l.* respectively, were commenced in May last, and are rapidly approaching completion. Offices in new buildings let for 6s. 2d. per square foot per annum. One of the large retail department stores is making an addition to its property, and is erecting a twelve-story building, 224 ft. by 151 ft. Some of the land was occupied by a six-story building, used as part of the store, and the remainder by a theatre and office, and on May 1 the tenants commenced to move out. The foundations consist of eighty-four concrete caissons, varying from 5 ft. 9 in. to 8 ft. 6 in., according to the weight they have to bear; but it has been calculated to have 4 tons load to the square foot at the bottom line of the caisson, where it rests on solid soil 75 ft. below the city datum. The steel columns supporting the whole framework are spaced at 22 ft. 1 in. running east and west, and 13 ft 4 in. north and south, the latter being spaced at the same distances as the aisles in the building now in use, standing at the south of the new building, so that the aisles may run straight through. The outside columns, which are 19 in. by 17 in., rest on a cast-iron shoe of 5 ft. 3 in., 6 ft. 6 in., or 7 ft. 6 in. in diameter, placed on the top of the caissons. The inside columns rest on two heavy girders which in turn are supported by two layers of steel beams resting on the top of the caissons. The building is of the type known as the skeleton construction, being entirely supported by steel columns and girders on which the loads are distributed and, through them, carried down to the foundations. This type of building originated in Chicago. The floors are fireproof, built of hollow flat tile arches, and the building is fitted throughout with heating apparatus and automatic fire sprinklers. The front is built of granite and the back of white terra-cotta brick. The stones arrive from the quarry ready to put in place, and are numbered, so no cutting is done on the premises, except ornamental carving of doors and windows when the building is nearing completion. Each stone is anchored to the iron framework, and building can be begun on any story or on two or three at once without waiting for the lower stories to be completed. Three of the floors were used for the Christmas trade, although the ground floor and five floors at the top were unfinished except for the ironwork. The cost of the building is 330,000*l.*

THE BURLINGWICK ESTATE, CHISWICK.—A syndicate have recently purchased from the Duke of Devonshire a site of about 330 acres, forming part of the Devonsbire meadows, near Grove Park, and having a frontage of nearly two miles in length to the Thames. The syndicate, of which Mr. Jonathan T. Carr is the manager, propose to lay out the property as a residential quarter. Their plans comprise the building of churches, club-houses, and kindred institutions, a market-place, shops, and open squares, with houses for some 35,000 inhabitants, that will be let at rents ranging from 50*l.* to 75*l.* per annum, and to set aside 13 acres for the erection of dwellings for the labouring classes. They offer, it is stated, to the Chiswick District Council the entire river frontage, which will have a width of 80 ft., for the nominal sum of 1s., provided that the Council will undertake to convert it into a waterside boulevard or promenade, and to provide for its care and maintenance. The latter expense could be partly met by the leasing of the right to run tramway cars from the new bridge at Kew through Strand-on-the-Green to the Mall at Chiswick, a project that would furnish an alternative route to the line that now follows the main road.

CAPITAL AND LABOUR.

HULL BUILDING TRADES.—A meeting of the joiners, bricklayers, masons, plasterers, and labourers was held in the Assembly Rooms, Hull, on the 6th inst., to receive the report of the joint deputation to the Master Builders' Association on April 22, with regard to the readjustment of the working rules respecting the starting times in winter and the starting places—the latter being where men were allowed walking time. The meeting was private, but it is stated that the arrangements made by the joint deputation were accepted by a very large majority. A resolution was passed that the new order of things come into operation on June 1, and that the report read by the secretary of the joint committee, containing a recommendation that the existing code of rules should not be interfered with for at least two years, was accepted.

BRISTOL OPERATIVES.—The six months' notice served by the Bristol Master Builders' Association upon the operative societies comes into operation on June 30. It deals with alteration of rules and a reduction of wages to the extent of one penny per hour. At a conference between the masters and men the position has been discussed, but no decision was arrived at, and a further interview will probably take place at an early date.—*Western Press.*

THE PLUMBERS' STRIKE, GLASGOW.—The plumbers' strike came to an end on the 8th inst., when both parties agreed to the arrangement come to at a recent joint conference. As a result of this agreement the men will be paid overtime after working a full working day of nine hours, instead of after a working week of fifty-one hours, as formerly.

LEGAL.

AN ENGINEERING FEAT.

THE case of *in re* an arbitration between the City and South London Railway Company and the Rector and Churchwardens of the united parishes of St. Mary Woolnoth and St. Mary Woolchurch Haw came before Mr. Justice Wright, sitting without a jury, in the King's Bench Division on Wednesday.

This was a special case stated by the Arbitrator, Mr. R. Vigers, raising the question as to the basis on which the Rector and Churchwardens of the united parishes of St. Mary Woolnoth and St. Mary Woolchurch Haw, were to be compensated for that part of the site of the Church of St. Mary Woolnoth which the City and South London Railway Company had taken for the purpose of extending their line from London Bridge to the Angel, Islington.

Mr. Balfour Brown, K.C., Mr. Eldon Bankes, K.C., and Mr. Ames appeared for the City and South London Railway Co.; Mr. Freeman, K.C., and Mr. Boyle, K.C., for the united parishes of St. Mary Woolnoth and St. Mary Woolchurch Haw; and Mr. Dibdin, K.C., and Mr. J. Shaw for the Attorney-General and the Ecclesiastical Commissioners.

Mr. Bankes, in opening the case, said that the City and South London railway was a tube railway running between Clapham Common and the Angel, Islington. In 1890, the Company were promoting a Bill to continue their line from London Bridge to the Angel, Islington, and they scheduled the church of St. Mary Woolnoth at the corner of Lombard-street as a portion of the land they desired to take. That Bill passed without opposition, and under it the Company were entitled to take the church. The work was not carried out within the time specified, and the company had to apply to Parliament in 1890 for an extension of time. A serious opposition was then raised to the company taking the church, but the Act was ultimately passed on the condition, as the Company contended, that they took not the church, but an easement under it, and certain lands which formed part of the surroundings of the church. In constructing the line the entire subsoil of the church was excavated, and by a wonderful piece of engineering the building was placed on a steel foundation and preserved. The rector and churchwardens alleged that they were entitled to regard the site of the church as a building site; that for the 1,699 ft. of land outside the church they were entitled to 101,940*l.*, which was at the rate of 60*l.* a foot; and that with regard to the land upon which the church stood the Company had so constructed their works as to injuriously affect the site as a building site, and that, therefore, they were entitled to damages to the extent of 30*l.* per foot, which was 50 per cent. of its value. The arbitrator had for the purposes of this case arrived at three alternative findings. He awarded against the Company 90,628*l.* if all the lands taken belonged to the site of the Church of St. Mary Woolnoth, and could never be used for any other purpose; or 136,421*l.* if the lands taken might have become under some Act of Parliament a scheme under the Union of Benefices Act, 1860, at some future time available for building purposes; or 143,548*l.* if the site of the church and the other land could be made immediately available for the erection of buildings other than a church. He (the learned counsel) submitted that the compensation should be awarded on the basis that all the lands taken formed the site of the church, and could never be used for any other purpose, and that the case should be referred back to the arbitrator in order that he might explain how the 90,000*l.* was made up. Under the provisions of the Act of 1896 it was clear that the compensation was to be based on the assumption that the church was to remain. The company had expended upwards of 30,000*l.* in providing a steel foundation for the church.

Mr. Boyle contended that the company were at least liable to pay compensation on the basis that the site of the church might have at some future period become available for building.

Mr. Justice Wright, at the couclusion of the arguments, said he could not agree with the contention of Mr. Bankes that the claimants were only entitled to compensation on the basis that the lands taken formed the site of the church, and could never be used for any other purpose. Under the Union of Benefices Act the site of the church could be made available for building purposes, and therefore he thought that the claimants were entitled to compensation on the basis that the site of the church might have at some future date become available as a building site.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

801.—CEMENT AND LIME KILNS: *F. S. Rigby.*—The kilns, for the making of Portland cement or lime, are built up of iron plates, and are provided with a jacket through which water is caused to circulate.

816.—ATTACHMENTS FOR WINDOWS: *F. M. Byrens, G. E. Drew, and T. R. Pearson.*—Rectangular or other grooves are made in the sash stiles and rails that will take ribbed strips, which should be of zinc, that are fastened on to the window frame; the inner face of the rib is bevelled or inclined to the flanges, whilst its outer rectangular face presses against the side of the groove. Leakage is prevented by the mitring of the ribs at the corner of the frame.

840.—IMPROVEMENTS IN ELECTRICAL CUT-OUTS: *Siemens & Halske A.-G.*—The inventors seek to diminish arcing by putting fusible strips into tubes and connecting them by means of a thicker and less fusible strip, two fuses after the kind specified may be connected in series; some such infusible materials as talc, ashes, whiting, and so on are filled into the tubes.

857.—IMPROVEMENTS IN VICES: *A. W. Bevis and W. F. Hutchings.*—A stem that slides in the fixed jaw carries the movable jaw. The stem contains a bar having a T-shaped head which engages with a cam and holes which engage with the pins, and the bar can rock in the stem. The cam, which has a lever handle, will swivel upon the movable jaw, and the head of the bar is maintained in engagement with the cam by a spring; the turning of the lever handle causes the bar to rock so that the pins and the holes become engaged and then the jaw advances to the grip. The bar falls when the handle is turned back, so that one can freely slide the movable jaw backwards or forwards and thereby rapidly effect an adjustment.

862.—BLOCKS FOR BUILDERS' USE: *W. Robertson.*—Blocks made of cement, earthenware, or glass are fashioned with T-shaped projections and with recesses for interlocking purposes. For doorways and window openings the blocks have three plane faces or sides, and the projections and recesses are formed upon the adjacent sides of quoins or corner-blocks.

876.—APPARATUS FOR OPENING AND SHUTTING DOORS: *F. Stead.*—The door is shut with a spring and opened by the pressure of one's own weight as one stands upon a platform that rests upon links carried upon knife-edges on levers, of which the free ends are linked together. Segmental racks upon one of the levers are set in gear with two toothed segments which turn loosely upon a shaft to which a sliding clutch joins one or the other of the segments. The free end of the other lever works the clutch block to which it is joined by levers. Toothed gearing transmits the motion of the shaft to the door-spindle, to which is attached a pin having a lever for the action of the spring that closes the door.

903.—SIPHONICAL DISCHARGE: *S. H. Adams*—The apparatus is devised for various purposes, com-

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prising sewers and bacterial filter beds. The siphon is arranged so as to discharge into a trap furnished with a weir, whereof the upper level is just below the level of the end of the siphon; a V-shaped notch forms the outlet for the weir. In another shape the inventor extends the discharge pipe of the siphon to above the level of the intake, and provides an auxiliary discharge pipe for the main discharge pipe. As the level falls inside the trap the action of the siphon will be interrupted, and the siphon will be again started as the level rises within the siphon chamber by fitting an air-pipe on it, and an adjustable sluice for regulating its action may be fitted on to the channel into which the siphon discharges the liquid. In the case of filter beds or tanks a bent pipe or over-draw arm is provided, and the liquid is discharged through the siphon from a compartment between which and the filtering media a pierced partition is placed.

910.—METALLIC LATHING: *J. Schratwieser.*—Metallic lathing sheets are slitted and pierced and have edges that can be turned backwards so as to constitute dovetailed recesses for taking the plaster, the creeping length-wise of the plaster is obviated by means of angle-tongues which are to be turned back. Overlapping joints are formed by the curved edges, the ends of the flanges are to be flattened at the ends of the lathing sheets.

925.—ROOFING AND CONSTRUCTION OF ROOFS: *F. A. Abeleven.*—For connecting corrugated metallic sheets to one another and to the purlins are devised strips of metal having clips that will take the edges of the sheets and lugs to be bent so as to clip the purlins; or they may have key-holed slots for engagement with swivelling keys or catches. Otherwise lugs and lower clips are discarded, and screws are driven through the strips and the upper edges of the sheets into the purlins. At the places where the sides of the plates overlap one another the clips are fashioned at wider intervals, an angle-ridge cap is caused to slide into the upper clips, being held up with carriers above the ridge-bar, and the eaves-gutter is fastened beneath the bottom sheets. The roofing is intended for huts, booths, exhibition-buildings and portable structures in general.

932.—CONSTRUCTION OF BRIDGES: *F. J. Arnodin.*—The middle section of the bridge is pivoted on to cantilever sections that are pivoted on to piers or supports and hang upon cables, chains, or rods. In order to dispense with long anchoring chains for balancing the oblique pull of the suspending-chains, there are outer bridge-sections which are pivoted on to the piers and are hung from cables; at the ends of those outer sections are vertical rods or cables, which are anchored in the masonry, &c. In another adaptation, a pier is constructed for supporting the middle girder bridge or section at its one end, the other and inner end being secured to the pivoted and suspended cantilever section.

937.—AN APPLIANCE FOR USE WITH DRAWING-SQUARES: *M. S. Excell.*—Batters and slopes may be set out by means of a sheet, made of celluloid or some such material, wherein is cut a series of slits. A pencil can be drawn through the slits for marking lines that will make the angles desired with the base.

942.—A LIFTING-JACK: *J. C. Crellin.*—For dealing with portions of machinery, as, for instance, tramcar motor armatures, is provided a truck which will run underneath the car, and carries a ram-cylinder, a hand-pump, a supply tank, and an outlet-valve through which water will flow back into the tank; otherwise, a telescopical ram is employed, having a plunger and a sliding cylinder.

946.—A SUPPORT FOR ELECTRICAL LAMPS: *G. Stevenson and W. H. Farnsworth.*—For an incandescent lamp an insulating-block is screwed on to a spring with three holes that slide upon and grip a stretched carrying-wire of steel; in the block is a hole for the flexible conductors of the lamp-holder which are clipped on to the block. In another form two springs hold the block, one of which has two bends that press against the one side of the wire whereby the support can be adjusted sideways, and the other has two bends and two notched ends that press against the wire from the opposite side.

977.—FLOORING: *C. W. Matthews.*—A flooring for which many convenient and serviceable properties are claimed, is composed of an admixture, to be applied as a cement, consisting of equal parts by measure of fine or granulated iron slag, cork, sawdust, and Portland, Roman, or some kindred cement, in a dry state, to be wetted just before it is used.

1,044.—A FUEL-ECONOMISER: *J. Welch and D. Sanderson.*—The contrivance consists of a row of separate bars, each of which can be readily removed, that are placed horizontally above the bottom bars and between the front bars of the grate, two end plates, recessed so as to take the bars, are interposed between each pair of the ordinary front bars, and one extra bar is mounted upon each pair of the end plates. At the top, on the right side, a conical boss retains the corresponding extra bar with a spiral spring, curved recesses or slots hold the lower bars. The extra bars for the bottom of the grate are detachably mounted in holes in bearers whereof the back ends lie upon the grate and the front ends are hooked over the lowest fixed bar.

1,058.—AN APPLIANCE FOR USE WITH INCANDESCENT BURNERS: *J. H. Sheldrake.*—In order to protect the lower end of the mantle, as well as to afford means of easily cleaning the head of the burner, both the support of the mantle and the mantle-guard with the chimney-holder attached to it are mounted upon a detachable tube which is secured to the head of the burner with a bayonet or other adjustment.

1,070.—TREATMENT OF SEWAGE: *W. D. Scott-Moncrieff.*—For distributing liquids evenly over the upper surfaces of filter-beds as used in a system of bacterial treatment, and over similar large areas, is employed a middle rotatory pipe that communicates with a horizontal pipe carried upon a girder that revolves, upon rollers, around the former pipe, each section of the latter pipe has a discharge opening fitted with a regulating sliding cover which has an inlet and discharge ports; the liquid is conveyed from the covers into a trough formed along the upper portion of the horizontal pipe and thence into the filter bed or other area.

1,096.—LAMPS FOR THE EXTRACTION OF SEWER-GAS: *J. E. Webb.*—The head of a street-lamp which is adapted for that purpose has a base-plate resting on frames upon the lamp-post with grooved frames or rods upon a ring that carries a hinged hood, the hood is to be clamped on to an asbestos packing-ring bolted to the ring and flanged so as to engage over a flange of the ring, the forked terminal of the hood will engage with the arm of the post when it is turned over.

1,108.—AN APPLIANCE FOR USE WITH STOVES AND GRATES: *C. McCallum and J. McKinlay.*—For promoting the economy of fuel is devised a chamber made of metal and shaped as a wedge, having openings pierced through its ends and sides, or its front alone; the openings are intended for the deposit in them of lumps of coal, gum, dross, &c., and the chamber is to be put into the firegrate.

MEETINGS.

FRIDAY, MAY 16.

Royal Institution.—Sir Robert Ball on "The Nebular Theory." 9 p.m.

Institution of Mechanical Engineers.—Conversazione. 9 p.m.

SATURDAY, MAY 17.

Edinburgh Architectural Association. — Visit to Hamilton.

WEDNESDAY, MAY 21.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting. 8 p.m.

British Archæological Association.—Mr. W. J. Andrew, F.S.A., on "Buried Treasure: some Traditions, Records, and Facts." 8 p.m.

THURSDAY, MAY 22.

Surveyors' Institution.—Country meeting, at Cambridge. Reading and discussion of papers.

Royal Institution.—Mr. M. H. Spielmann on "Contemporary British Sculpture." I. 3 p.m.

Institution of Electrical Engineers.—Annual general meeting, to receive the annual report of the Council and statement of accounts and balance-sheet for the twelve months ending December 31, 1901. The announcement of the election of new Council will also be made at this meeting. 8 p.m.

FRIDAY, MAY 23.

Surveyors' Institution.—Country meeting, Cambridge. Excursions.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

April 30.—By WILLIAM WEATHERHEAD (at Keighley).

Glasburn, Yorks.—Leys Laithe Farm, 59 a. 0 r. 39 p., f.	£2,350
Cowling, Yorks.—Cray Side and Bailden Farm, 21 a. 1 r. 31 p., f.	1,405
Pond Hill Farm, 28 a., f.	630

By BELLAMY & Co. (at Putney).

Putney.—Lower Richmond-rd., Stockhurst Villa and Niton House, f., e.r. 96*l.*	1,575
16 and 18, Werter-rd., u.t. 72 yrs., g.r. 15*l.*, e.r. 95*l.*	900

By HENRY HENDRIKS (at Birmingham).

West Bromwich, Staffs.—117, 119, 121, and 123, Beeches-rd., u.t. 90 yrs., g.r. 16*l.* 16s., y.r. 83*l.*	875

May 1.—By HARDS & BRADLY (at Maidstone).

Marden, Kent.—Three freehold enclosures, 19 a. 3 r. 1 p.	400

By WM. WESTON (at Uxbridge).

Uxbridge, Middx.—4, 5, and 6, Waterloo-rd., f., w.r. 31*l.* 4s.	360

May 5.—By BLAKE & CARPENTER.

Shirley, Surrey.—Oaks-rd., a block of freehold building land, 17 a.	£3,150

By T. D. PEACEY.

Holloway.—Hampden-rd., f.g.r. 14*l.*, reversion in 66 yrs.	365
Camden Town.—North Villas, i.g.r. 22*l.*, u.t. 60½ yrs., g.r. nil	440
South Villas, i.g.r.'s 22*l.*, u.t. 60½ yrs., g.r. nil	450
South Villas, i.g.r. 22*l.*, u.t. 60½ yrs., g.r. 1*l.*	425
St. Paul's-rd., i.g.r. 20*l.*, u.t. 29 yrs., g.r. nil	235
King's-rd., i.g.r.'s 38*l.*, u.t. 40 yrs., g.r. nil	605
Holloway.—York-rd., i.g.r. 35*l.*, u.t. 59 yrs., g.r. nil	600
York-rd., i.g.r.'s 42*l.*, u.t. 59 yrs., g.r. 2*l.*	£755
Crayford-rd., i.g.r.'s 27*l.* 10s., u.t. 50 yrs., g.r. 1*l.*	475
Dalmeny-av., i.g.r.'s 40*l.*, u.t. 17½ yrs., g.r. 18*l.* 10s.	195
Kensington.—Stanford-rd., i.g.r. 10*l.*, u.t. 30 yrs., g.r. nil	155
Kilburn.—Canterbury-rd., i.g.r. 18*l.*, u.t. 57½ yrs., g.r. 2*l.*	285

By ROBINSON & SONS.

Milton-next-Gravesend, Kent.—15 and 16, Norfolk-rd., f., w.r. 40*l.* 6s.	560
Swanscombe, Kent.—14, Albert-ter. (S.), u.t. 79 yrs., g.r. 2*l.* 2s. 6d., y.r. 22*l.*	200

By WEATHERALL & GREEN.

Camberwell.—Wilby-rd., f.g.r.'s 28*l.* 10s., reversion in 33 yrs.	1,250
Grove-lane, f.g.r. 6*l.* 10s., reversion in 33 yrs.	430

May 6.—By DEBENHAM, TEWSON, & Co.

Camberwell Gate.—Walworth-rd., The Rock p.-h., f.g.r. 20*l.*, reversion in 21½ yrs.	8,000
Walworth-rd., &c., f.g.r. 60*l.*, reversion in 7½ yrs.	2,300
Empress-st., f.g.r.'s 22*l.* 10s., reversion in 21½ yrs.	850
Regent's Park.—13, Eton-st., u.t. 59½ yrs., g.r. 6*l.*, y.r. 38*l.*	375
Hornsey.—245, Wightman-rd., u.t. 82½ yrs., g.r. 7*l.* 10s., y.r. 38*l.*	450

By CHAS. CANRY.

Bermondsey.—41, Drummond-rd., u.t. 32 yrs., g.r. 3*l.*, w.r. 41*l.* 12s.	275
331 and 333, Southwark-pk.-rd., u.t. 15 yrs., g.r. 7*l.* 4s., y.r. 81*l.* 12s.	395
Camberwell.—32, Vicarage-rd., u.t. 48 yrs., g.r. 8*l.*, e.r. 42*l.*	350

By GILLOW & Co.

Bloomsbury.—29, Gordon-sq., u.t. 39 yrs., g.r. 5*l.*, p.	2,000
East Molesey, Surrey.—Wolsey-rd., Camden House and o a. 3 r. 18 p., f., p.	2,500

By J. & W. JOHNSON & Co.

Manor Park.—211 to 221 (odd), Sherrard-rd., f., w.r. 156*l.*	1,600

By J. C. PLATT.

Hammersmith.—32 to 46 (even), Great Church-lane, u.t. 77 yrs., g.r. 44*l.*, w.r. 327*l.* 12s.	3,255
Shepherd's Bush.—2, Blomfield-villas, f., y.r. 70*l.*	2,100

By C. & F. RUTLEY.

Hockley, Essex.—Marsh Farm, 255 a. 3 r. 24 p., f.	2,375
Mile End Road.—Globe Wharf, i.g.r. 52*l.* 10s., u.t. 46½ yrs., g.r. 10*l.*	830
Brompton.—52 to 58 (even), St. Oswald's-rd., u.t. 73¾ yrs., g.r. 32*l.*, y.r. 177*l.*	1,340
Upper Caterham, Surrey.—Main-rd., freehold building land, 10 a. 1 r. 30 p.	910
High-st. two plots of building land, f.	395
Caterham Valley, Surrey.—High-st., two plots of building land, f.	130

By T. B. WESTACOTT.

Strand.—7, Burleigh-st. (S), u.t. 36 yrs., g.r. 15*l.*, y.r. 120*l.*	2,350
St. George's East.—32 to 42 (even), John-st., f., w.r. 132*l.* 12s.	2,090
Holloway.—219, Brecknock-rd., u.t. 67 yrs., g.r. 6*l.* 10s., y.r. 44*l.*	400
240, Brecknock-rd., u.t. 67 yrs., g.r. 6*l.* 6s., y.r. 42*l.*	405

By J. J. HILL & WEAVER (at Masons' Hall Tavern).

Northfleet, Kent.—The Rosherville Hotel, u.t. 34 yrs., y.r. 70*l.*	200

May 7.—By BEARD & SON.

Notting Hill.—125, High-st. (S), f., y.r. 65*l.*	1,470
Fulham.—182, Wandsworth Bridge-rd. (S), f., y.r. 65*l.*	1,205

By HORNE & Co.

Belgravia.—Elizabeth-st., The Royal Oak p.-h., i.g.r. 60*l.*, u.t. 21 yrs., g.r. 1*l.* 5s.	900

By FRANK JOLLY & Co.

Paddington.—24, South Wharf-rd., u.t. 19½ yrs., g.r. 5*l.*, y.r. 38*l.*	850

By A. PREECE & SON.

City-rd.—27, Fairbank-st., u.t. 45½ yrs., g.r. 6*l.* 10s., y.r. 55*l.*	565
Kentish Town.—4, Hadley-st., u.t. 56½ yrs., g.r. 5*l.*, y.r. 30*l.*	295

By ALFRED RICHARDS.

Waltham Abbey, Essex.—Eleanor Cross-rd., freehold building land, 5 a. 3 r. 3 p.	2,250
Enfield.—28 to 30 (even), Churchbury-rd., f., w.r. 109*l.* 4s.	950

By WINDRUM & CLEAVE.

Bromley-by-Bow.—1 and 3, Blackthorn-st., f., w.r. 64*l.* 15s.	720
29, 30, 31, 35, and 36, Tidey-st., f., w.r. 159*l.* 18s.	1,470
Poplar.—1 to 5, Norfolk-st., u.t. 48 yrs., g.r. 22*l.*, w.r. 144*l.* 6s.	740
Plaistow.—7 to 17 (odd), Abbey-st., part freehold and part u.t. 61 yrs., g.r. 8*l.*, w.r. 120*l.* 18s.	575

By WOOTTON & GREEN.

Westminster.—10, 12, and 14, St. Ann's-lane, f., w.r. 44*l.* 4s.	550

By DOUGLAS YOUNG & Co.

Kingston, Surrey.—196, King's-rd., u.t. 78 yrs., g.r. 6*l.*, y.r. 30*l.*	310

May 8.—By DRIVERS (Holloway).

Southgate.—Enfield-rd., a freehold residence, y.r. 36*l.*	590
Reservoir-rd, Torquay Villa, f., e.r. 24*l.*	850
Finsbury Pk.—12, St. Thomas'-rd., u.t. 60 yrs., g.r. 6*l.*, y.r. 40*l.*	480

By FAREBROTHER, ELLIS, & Co.

Oxford-st.—No. 193 (S), area 936 ft., f., y.r. 385*l.*	9,550
4, 5, and 6, Ramilies-st. (warehouses), area 1,524 ft., f., y.r. 150*l.*	5,000
Ramilies-st., The Marlborough Inn, a freehold rental of 110*l.*, reversion in 17 yrs.	3,000
Stanmore, Middlesex.—Stanmore Hill, freehold building land, 10 a. 2 r. 16 p.	3,000

By FOLKARD & HAYWARD.

Ealing.—65, Mount Park-rd., u.t. 85½ yrs., gr. 12*l.*, y.r. 80*l.*	990

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By A. & G. GUIVER.

Enfield Wash, Middx.—1 and 2, Freezywater Houses and 1a. 1r. 37p., f., p. £1,360

By WALTER HALL.

Holloway.—51, St. John's Villas, f., e.r. 65*l.* .. 750
Wood Green.—12, Mayes-rd., u.t. 78 yrs., g.r. 8*l.* 8s., y.r. 42*l.* 400
Willesden.—Market-pl., f.g.r.'s 32*l.*, reversion in 96½ yrs. 790
Hendon.—Milton-ter., f.g.r.'s 32*l.*, reversion in 96½ yrs. 780

By C. C. & T. MOORE.

Poplar.—259, East India Dock-rd., f., y.r. 80*l.* .. 1,400
Bow.—133, Bow-rd., u.t. 29 yrs., g.r. 7*l.*, y.r. 55*l.* 480
Stratford.—55 to 65 (odd), Howard's-rd., u.t. 63¾ yrs., g.r. 18*l.* 10s., w.r. 133*l.* 18s. 750
40 and 42, Western-st., f., w.r. 49*l.* 8s. 475
Walthamstow.—55 and 57, Cottenham-rd., u.t. 78 yrs., g.r. 8*l.*, y.r. 60*l.* 350

By NOTT, CARTWRIGHT & ETCHES.

Shepherd's Bush.—77, Sterndale-rd., u.t. 80½ yrs., g.r. 7*l.*, y.r. 45*l.* 555
Croydon.—2, Elmwood-rd., area 8,000 ft. f., y.r. 45*l.* 575
Peckham.—Dennett's-rd., f.g.r.'s 50*l.* 3s. 6d., reversion in 51 yrs. 1,300
Dennett's-rd., f.g.r.'s 36*l.* 5s., reversion in 56 yrs. 800
Dennett's-rd., The Rising Sun, p.-h., &c., f.g.r. 10*l.*, reversion in 41 yrs. 330
New Malden, Surrey.—Penrith-rd., Merton House, and Rosslyn, f., y.r. 60*l.* 720
Pimlico.—21, Sussex-st. (S.), u.t. 30 yrs., g.r. 10*l.*, y.r. 80*l.* 960
33, Moreton-ter., u.t. 28½ yrs., g.r. 8*l.*, y.r. 47*l.* 420
51, Denbigh-st., u.t. 28 yrs., g.r. 9*l.*, e.r. 90*l.* .. 525

By NEWBON, EDWARDS & SHEPHARD.

Holloway.—15, Stock Orchard-cres., u.t. 40 yrs., g.r. 8*l.*, y.r. 45*l.* 370
23 and 25, Ringcroft-st., u.t. 42 yrs., g.r. 12*l.*, y.r. 74*l.* 695
Kentish Town.—32 to 38 (even), Willes-rd., f., y.r. 182*l.* 0s. 3d. 2,890
8, Cathcart-st., f., w.r. 42*l.* 18s. 440
Barnsbury.—44, Albion-grove, u.t. 42 yrs., g.r. 7*l.* 10s., e.r. 38*l.* 325
34, Richmond-rd., u.t. 32½ yrs., g.r. 8*l.*, y.r. 46*l.* 385
Caledonian-rd.—No. 293 (S.), u.t. 42 yrs., g.r. 6*l.*, y.r. 63*l.* 850
No. 410 (S.), u.t. 40½ yrs., g.r. 8*l.*, y.r. 45*l.* 480
No. 480 (S.), u.t. 50 yrs., g.r. 8*l.*, y.r. 100*l.* 1,605
Canonbury.—25, Canonbury Park South, u.t. 34 yrs., g.r. 7*l.*, y.r. 50*l.* 405
Dalston.—74, Graham-rd., u.t. 57 yrs., g.r. 5*l.*, e.r. 46*l.* 385
Notting Hill. — Portobello-rd., the Freemasons' Arms p.-h., i.g.r. 75*l.*, u.t. 42½ yrs., g.r. 25*l.*.. 730
Stoke Newington.—80 to 86 (even), Oldfield-rd., u.t. 73½ yrs., g.r. 21*l.*, y.r. 112*l.* 1,290
Clapham.—44, Lansdowne-rd., f., e.r. 45*l.* 530
Kew, Surrey.—230, Kew-rd., u.t. 74½ yrs., g.r. 20*l.*, y.r. 100*l.* 1,000

By STIMSON & SONS.

Croydon.—St. James's-rd., a plot of building land, f. 300
Dominion-rd., building land, area 14,880 ft. f... 505
Kennington. — 47, Lower Kennington-lane, f., e.r. 36*l.* 580
Notting Hill.—30, Silchester-ter. (S.), and 36, Mersey-st., u.t. 53 yrs., g.r. 10*l.* 6s., w.r. 7*l.* 10s. 400
Brockley.—Holdenby-rd., i.g.r.'s 28*l.*, u.t. 75 yrs., g.r. 8*l.* 400

By WILLIAM STEVENS.

New Barnet, Herts.—Victoria-rd., Lorne Villa, f., p. 350

By H. J. BLISS & SONS.

Homerton. — 140, Ballance-rd., u.t. 57½ yrs., g.r. 4*l.*, w.r. 39*l.* 280
Bethnal Green.—85, Roman-rd., f., w.r. 32*l.* 10s. 590
2, Vivian-rd., f., w.r. 37*l.* 14s. 700
10, 12, and 22, Cranbrook-rd., f., w.r. 72*l.* 6s. .. 1,010
269 and 271, Globe-rd., and 1A, Burnham-sq., f., w.r. 74*l.* 2s. 640
5 to 8, Burnham-sq., f., w.r. 71*l.* 10s. 635
7 and 8, Sugar Loaf-walk, f., w.r. 52*l.* 725
170, 170A, 172, and 174, Green-st. (S), with yard, stabling, &c., in rear, f., y.r. 198*l.* 2,150
9, Tagg-st., f., w.r. 27*l.* 6s. 340
24, 25, and 26, Braemar-st., f., w.r. 72*l.* 16s. .. 830
31, Moss-st., f., w.r. 27*l.* 6s. 265
13, Granby-st., f., w.r. 26*l.* 375
277 and 279, Old Ford-rd., f., w.r. 65*l.* 880
193, Roman-rd. (S), f., y.r. 30*l.* 640
Old Ford-rd., &c., f.g.r. 6*l.*, reversion in 41 yrs. 270
Old Ford-rd., &c., f.g.r. 15*l.*, reversion in 45 yrs. 530
Victoria Park.—104 to 116 (even), Bonner-rd., u.t. 51½ yrs., g.r. 35*l.*, y.r. 221*l.* 2,650
Old Ford.—1 and 3, Cranbrook-st., u.t. 38 yrs., g.r. 5*l.*, w.r. 48*l.* 2s. 375

May 9.—By GEO. FITT & CO.

Clerkenwell.—14 and 16, Northampton-rd., u.t. 27 yrs., g.r. 6*l.* 6s., y.r. 85*l.* 410
14 and 15, Vineyard-gdns., u.t. 23 yrs., g.r. 9*l.* 5s., y.r. 60*l.* 770

By JONES SON & DAY.

Hoxton.—3, 4, and 5, Liverington-pl., f., r. 46*l.* 16s. 320
Wimbledon.—134, Gladstone-rd., u.t. 79 yrs., g.r. 5*l.*, y.r. 32*l.* 310
127, Pelham-rd., u.t. 74 yrs., g.r. 3*l.* 10s., w.r. 20*l.* 16s. 145
Poplar.—1, Buxton-ter., u.t. 76½ yrs., g.r. 6*l.*, w.r. 36*l.* 8s. 190

By MAY & ROWDEN.

Edgware-rd.—1 to 4, Newnham-st., f., p. 2,640
Newnham-st., The Victory, p.-h., perpetual f.g.r. 24*l.* 660

By PARSONS & TOWNSEND.

Wimbledon.—72 and 72, High-st. (S.), f., y.r. 130*l.* 2,500

By REYNOLDS & EASON.

Bishopsgate-st. Without.—No. 113, also the Lord Nelson p.-h., improved rental of 85*l.* for 37 yrs. 1,500
Finsbury.—39, Scrutton-st., f., y.r. 40*l.* 900
Clapton.—74 to 80 (even), Overbury-st., u.t. 76 yrs., g.r. 20*l.*, y.r. 122*l.* 4s. 800

By TOWERS, ELLIS & CO.

Bayswater.—53, Chepstow-pl., u.t. 56 yrs., g.r. 12*l.*, e.r. 115*l.* £820
Enfield.—Birkbeck-rd., f.g.r. 36*l.*, reversion in 77 yrs. 835

By WM. WESTON.

Paddington.—7, Elgin-av., u.t. 61 yrs., g.r. 12*l.*, y.r. 65*l.* 710
Kilburn.—12, Quex-rd., f., y.r. 60*l.* 900
Brompton.—14, Wharfedale-rd., u.t. 62 yrs., g.r. 9*l.*, y.r. 50*l.* 460

By T. G. WHARTON.

Finsbury Park.—123, Queen's-rd., u.t. 73 yrs., g.r. 10*l.* 10s., e.r. 75*l.* 800

By WILTSHIRE & THURGOOD.

Commercial-rd. East.—No. 538 (S.), f., y.r. 50*l.*... 950

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; w.r. for weekly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 11 0	per 1,000	alongside, in river
Rough Stocks and Grizzles	1 9 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 5 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts ..	1 12 0	,,	,, ,,
Best Fareham Red	3 12 0	,,	,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,,	,, ,,
Do., Bullnose	4 11 0	,,	,,
Best Stourbridge Fire Bricks	4 6 0	,,	,, ,,

GLAZED BRICKS

Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers..	16 0 0	,,	,,
One Side and two Ends	19 0 0	,,	,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers..	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.
Thames and Pit Sand	7		3 per yard, delivered.
Thames Ballast	6 0	,,	,,
Best Portland Cement	31 0		per ton, delivered.
Best Ground Blue Lias Lime..	25 0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 10s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
Ancaster in blocks	1 11	per ft. cube, deld. rly. depot.	
Bath ,, ...	1 7	,,	,,
Farleigh Down Bath ..	1 8	,,	,,
Beer in blocks	1 6	,,	,,
Grinshill ,, ...	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks..	2 4	,,	,,
Red Corsehill ,,	2 5	,,	,,
Closeburn Red Freestone	2 3	,,	,,
Red Mansfield ,,	2 4	,,	,,
Hard York in blocks ..	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt.	
,, ,, 6 in. Rubbed Ditto..	3 0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 2 in. self-faced Ditto	0 9½	,,	,,
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt	
,, ,, 6 in. sawn both sides landings	2	7 per ft. super. deld. rly. depôt.	
,, ,, 3 in. do.	1	2½ ,,	,,

PRICES CURRENT (*Continued*).

SLATES.

in. in.	£ s. d.		
20×10 best blue Bangor..	12 0 0	per 1000 of 1200 at ry. dep.	
,, best seconds ,,	11 10 0	,,	,,
16×8 best ,,	6 17 6	,,	,,
20×10 best blue Portmadoc	11 7 6	,,	,,
16×8 best blue Portmadoc	6 5 0	,,	,,
20×10 best Eureka unfading green....	13 10 0	,,	,,
16×8 ,, ,,	7 10 0	,,	,,
20×10 permanent green	10 10 0	,,	,,
16×8 ,, ,,	6 0 0	,,	,,

TILES.

	s. d.		
Best plain red roofing tiles..	41 6	per 1,000, at rly. depôt.	
Hip and valley tiles....	3 7	per doz.	,, ,,
Best Broseley tiles	48 6	per 1,000	,, ,,
Hip and valley tiles....	4 0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,, ,,
Do. ornamental Do.	60 0	,,	,, ,,
Hip tiles	4 0	per doz.	,, ,,
Valley tiles	3	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles.....	3 8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	14 10 0	16 0 0
Deals: best 3 by 9.....	13 10 0	15 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	10 10	11 10 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in. ..	8 10 0	9 10 0
2 in. by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks.....	2 15 0	3 0 0
Pitch-pine timber (30 ft.).....	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
,, ,, 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens.....	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.....	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens.....	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.....	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens.....	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
Battens.....	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
,, ,, ,, 3 in. by 9 in.	12 0 0	13 0 0
,, ,, ,, battens.....	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes..	32 0 0	33 10 0
Broads (12 in. and up).....	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small ,, ,, ...	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
¾ in. do. do.	0 0 7	. . .
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube.....	0 3 0	0 3 6
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6

[*See also next page.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Application to be in
*Municipal Buildings, Fire Station, Public Baths, &c.	Tottenham U.D.C.	200*l.*, 100*l.* and 50*l.*	July 15
*New Labourers' Dwellings	Liverpool Corporation	250*l.*, 150*l.*, 100*l.*	Sep. 15

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Additions to Workhouse	Kingston-on-Thames Guardians	J. Edgell, Coombe-road, Kingston-on-Thames	May 20
School, Lanner, near Redruth	.....	H. W. Collins, Architect, Walreddon, Redruth	do.
Wesleyan Chapel, Maesteg, Wales	.....	W. B. Rees, Architect, Cardiff	do.
Chalet, Pittville Park	Cheltenham Corporation	Borough Surveyor, Municipal Offices, Cheltenham	do.
Additions to School, Boconnoc, Cornwall	Mr. J. B. Fortescue	W. Pease, Solicitor, Lostwithiel	do.
*Children's Homes, Ashby-road	Watford Union	C. P. Ayres, Burvale, Watford	do.
Police Residence, Cricklade, Wilts	Standing Joint Committee	C. S. Adye, County Surveyor, County Offices, Trowbridge	do.
Cottage, Hartahill	Nuneaton U.D.C.	J. S. Pickering, Civil Engineer, Council Offices, Nuneaton	do.
Strong Room, Kendal	Messrs. Moser & Sons	J. Stalker, Architect, Kendal	do.
*Road-making, &c., in Blomfield-road	Borough of Hammersmith	Borough Surveyor, Town Hall, Broadway, Hammersmith	May 21
Additions to Masonic Hall, Killinchy, Ireland	.....	J. Robinson, Balloo Mills, Killinchy	do.
Cottage, Pear Tree-road, Chopwell, Durham	.....	D. M. Spence, Architect, Ashmount, Shotley Bridge	do.
Business Premises, Chopwell, Durham	.....	do.	do.
Wesleyan Chapel, Coppull, Lancs.	.....	W. H. Dinsley, Architect, 12, Cleveland-street, Chorley	do.
Farm Buildings, Illogan, Cornwall	.....	H. B. Paull, Tehidy Office, Camborne	do.
Additions to Workhouse Infirmary	Castleblaney (Ireland) Guardians	J. Keelaghan, Civil Engineer, Ballybay, near Castleblaney	do.
Additions to Drill Shed and Armoury	Bootle (Lancs) Corporation	Borough Engineer, Town Hall, Bootle	do.
Pavilion at Lunatic Asylum, Beverley	Visiting Committee	C. H. Hebblethwaite, Architect, 10, Waterhouse-street, Halifax	do.
Car Shed	Nelson (Lancs) Corporation	R. Ball, Civil Engineer, Borough Engineer, Town Hall, Nelson	do.
Villa, Auchterderran, Cardenden, N.B.	Bowhill Coal Co., Ltd.	W. Williamson, Architect, 220, High-street, Kirkcaldy	do.
Business Premises, Bargoed, Wales	.....	P. V. Jones, Architect, Hengoed	May 22
Baths and Library, York-road	Leeds Corporation	H. A. Chapman, Architect, Prudential Buildings, Leeds	do.
House, Aberdare	Cwmaman Coal Co.	Smith & Davis, Architects, Aberdare	do.
Hospital, Foxhall, Birstall, Yorks	Oakwell Hospital Board	J. W. Burrows, Architect, Birstall	do.
Church Institute and School, Crook, Durham	Rev. J. King	Oliver & Co., Architects, Mosley-street, Newcastle-on-Tyne	do.
Lodge, Little Chester Recreation Ground	Derby Corporation	J. Ward, Civil Engineer, Babington-lane, Derby	do.
House, Carnforth	Dr. Jackson	J. Pattinson, Architect, Windermere	do.
House, Dacre-terrace, Londonderry	Mr. R. N. Anderson	J. M. Robinson, C.E., Architect, 7, East Wall, Londonderry	do.
Additions to Church, Aber, near Caerphilly	.....	G. Jones, 21, Thomas-street, Aber, near Caerphilly	May 23
School, Lecture Hall, &c., Grange-over-Sands	.....	S. Shaw, Architect, Kendal	do.
Six Houses, Netherfield, Kendal	Mr. J. Richmond	do.	do.
Alterations to Workhouse	Bridlington Guardians	S. Dyer, Architect, Bridlington	do.
Additions to Workhouse, Stapleton	Bristol Guardians	J. J. Simpson, St. Peter's Hospital, Bristol	do.
Additions to Junction Hotel, Bargoed	.....	A. O. Evans, Architect, Pontypridd	May 24
Lodge, Entrance Gates, &c., Parkinson-lane	Halifax Corporation	J. Lord, Civil Engineer, Town Hall, Halifax	do.
Infirmary, &c.	Axbridge (Somt.) Guardians	A. Powell, Architect, College Green, Bristol	May 28
*Border Seatings, &c.	Beckenham U.D.C.	The Council's Surveyor, Beckenham	do.
*Sewer Works in Hawthorn and Beechwood-roads	Hornsey U.D.C.	Council's Engineer, Southwood-lane, Highgate, N.	do.
Additions to Schools, Rawnsley	Cannock (Staffs) School Board	Bailey & McConnal, Architects, Bridge-street, Walsall	do.
*Paving and Making-up Roads	Borough of Camberwell	Engineer, Town Hall, Camberwell, S.E.	do.
*Hot-water Supply at Isolation Hospital, Stonebridge	Willesden U.D.C.	Engineer to the Council, Public Offices, Dyne-road, Kilburn, N.W.	May 27
*Painting, &c., Casual Wards, Mackiln-street, W.C.	St. Giles & Bloomsbury Guardians	Guardians' Offices, 57, Broad-street, Bloomsbury, W.C.	do.
*Electric Car Shed and Offices at Hyde-road	Manchester Corporation	General Manager, Tramways Dept., 55, Piccadilly, Manchester	do.
*500 Creosoted Sleepers	Acton U.D.C.	Surveyor to the Council, 242, High-street, Acton, W.	do.
*Making-up Roads	Wood Green U.D.C.	Council's Surveyor, Town Hall, Wood Green	May 28
*Hospital Buildings, Serpentine-rd., West Hartlepool	Borough of West Hartlepool	Borough Engineer's Office, West Hartlepool	May 29
*Fire Engine Station, &c.	East Barnet Valley U.D.C.	Council's Surveyor, Station-road, New Barnet	do.
Underpinning at Asylum	.....	F. Whitmore, Architect, 17, Duke-street, Chelmsford	May 31
*Extension of Darlington Hospital	Darlington Hosp. Extension Com.	G. Gordon Hoskins, Court Chambers, Darlington	June 2
Additions, &c., to Hospital, Skirbeck	Boston U.D.C.	J. Rowell, Architect, Borough Offices, Boston	do.
*Sewer Works in Hove Villas, &c.	Borough of Hove	Borough Surveyor's Office, Town Hall, Hove	June 4
*Infant School at St. John's-road	Epping School Board	Harrington & Ley, 65, Bishopsgate-street Without, E.C.	do.
*Supply of Portland Cement	Hove Corporation	Borough Surveyor, Town Hall, Hove	do.
*Cleansing, Painting, and Repairs of 18 Schools	West Ham School Board	The Clerk's Office, Langport, Somerset	June 9
*Thirteen Miles Iron Mains, &c.	Langport R.D.C.	Borough Engineer, Town Hall, West Ham, E.	June 10
*Paving Sides of Roads	County Borough West Ham	W. Jacques, Architect, 2, Fen-court, E.C.	do.
*New Schools at Montague and Houndsfield-roads	Edmonton School Board	Board's Architect, 99, Church-street, Lower Edmonton	June 17
*Engineering Works at Workhouse	Stratford-on-Avon Union	C. Smith & Son, Architects, 164, Friar-street, Reading	No date
*New Laundry, Boiler House, &c., at Workhouse	do.	do.	do.
Lodge, House of Recovery, Carlisle	.....	Oliver & Dodgshun, Architects, Carlisle	do.
Chimney, Audenshaw, Lancs.	.....	Burton & Percival, Archts., 150, Stamford-st., Ashton-under-Lyne	do.
*Erection of Houses, Bromley, Kent	Kinnaird Park Estate Co., Ltd.	W. Prebble, Architect, Kinnaird Park, Bromley, Kent	do.
*Excavation and Removal of Chalk, Wallington	.....	Warren & Stupart, Architects, 385, Green-lanes, N.	do.
*12 Shops in Old Kent-road	Holman & Goodrham	Holman & Goodrham, 6, King's Bench Walk, Temple, E.C.	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Designs to be delivered
*Clerk of Works	East Riding Lunatic Asylum	3*l.* per week	May 24
*Clerk of Works	Manchester Corporation	4*l.* 4*s.* per week	do.
*Assistant (Borough Engineers' Office)	Leicester Corporation	135*l.*	May 27
*Architects' Assistant	London County Council	300*l.* per annum	June 2

Those marked with an asterisk (*) are advertised in this Number. *Competitions*, p. iv. *Contracts*, pp. iv. vi. viii. & x. *Public Appointments*, xviii.

PRICES CURRENT (*Continued*).

WOOD.

Prepared Flooring—	Per square £ s. d.	£ s. d.
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6

6 in. at 6d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

PRICES CURRENT (*Continued*).

METALS.

IRON—	Per ton, in London £ s. d.	£ s. d.
Common Bars	7 15 0	8 5 0
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 10 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	12 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -

PRICES CURRENT (*Continued*).

METALS.

IRON—	Per ton, in London. £ s. d.	£ s. d.
Sheet Iron, Galvanised, flat, best quality:—		
Ordinary sizes to 20 g.	16 0 0	- - -
,, ,, 22 g. and 24 g.	16 10 0	- - -
,, ,, 26 g.	18 0 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 0 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 5 0	9 15 0

(Under 3 in. usual trade extras.)

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PRICES CURRENT (*Continued*)

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 7 6	- - -
Pipe in coils	14 17 6	- - -
Soil Pipe	17 7 6	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet per lb.	0 1 0	- - -
Thin ,,	0 1 1½	- - -
Copper nails ,,	0 1 1½	- - -
BRASS—		
Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3½	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8½	- - -
Blowpipe ,,	0 0 10	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths	3d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, fourths	4d. ,, ,,
oz. thirds	5¼d. ,, ,,
,, fourths	5d. ,, ,,
Fluted sheet, 15 oz.	3d. ,, ,,
,, 21 ,,	4d. ,, ,,
½ Hartley's Rolled Plate	2d. ,, ,,
⅝ ,, ,, ,,	2¼d. ,, ,,
¾ ,, ,, ,,	2½d. ,, ,,

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes per gallon	0 2 8
,, ,, ,, in barrels ,,	0 2 9
,, ,, ,, in drums ,,	0 2 11
Boiled ,, ,, in pipes ,,	0 2 10
,, ,, ,, in barrels ,,	0 2 11
,, ,, ,, in drums ,,	0 3 1
Turpentine, in barrels ,,	0 2 8
,, in drums ,,	0 2 10
Genuine Ground English White Lead per ton	21 0 0
Red Lead, Dry ,,	20 10 0
Best Linseed Oil Putty per cwt.	0 8 6
Stockholm Tar per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l*., unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

CROYDON.—Detached house, Dingwall-avenue. Mr. A. Broad, architect, 22, George-street, Croydon. Quantities by the architect:—

Hanscomb & Smith	£1,385	Smith & Son	£1,178
Worsfold & Sons	1,325	J. Horsnocks	1,175
E. J. Saunders	1,280	Huntley Bros.	1,175
Smith & Sons, Ltd.	1,275	Akers & Co.	1,170
D. W. Barker	1,185	Pearson & Co.	1,120
S. Hart	1,180	W. Potter*	1,075

HARRINGTON (Cumberland).—For alterations, &c., to a dwelling-house at Harrington, for Mr. Thomas Rutherford. Messrs. W. G. Scott & Co., architects and surveyors, Victoria-buildings, Workington:—

Building.—B. Hyde, Westfield, Workington*	£214 6 6
Joinery.—H. Graham, Harrington*	104 17 0
Slating.—Lythgoe & Sons, Workington*	18 5 0
Plumbing.—D. M. Walker, Workington*	24 10 0
Plastering.—J. Lawson, Workington*	61 17 1
Painting.—J. Pratt, Harrington*	17 17 9
	£441 13 4

LEICESTER.—New shop for Mr. W. Skillington, Humberstone-gate, Leicester. Messrs. Everard & Pick, architects, Leicester:—

Johnson & Son	£1,435 0	Thomas Herbert	£1,350 0
Kellett & Son	1,433 0	Hutchinson & Son	1,330 7
Clarke & Garrett	1,387 0	A. & W. Chambers	1,330 0
Moss & Sons, Ltd.	1,353 0	Herbert & Sons	1,205 0

LONDON.—For the reconstruction of Rosemary Branch Bridge, Shoreditch, over the Regent's Canal, for the London County Council:—

Pethick Bros.	£17,700 0 0	Griffiths & Co	£10,861 8 8
Mayoh & Haley	16,993 4 3	M. Dinnie	10,814 3 4
Mowlem & Co.	12,439 19 1	Wilkinson Bros.*	9,985 0 0
G. K. Waghorn	11,960 19 1		
Fasey & Sons	11,067 14 8		

LONDON.—For alterations and additions to shop and premises, 106, Brompton-road, S.W. Messrs. Blangy & Van Baars, architects and surveyors, 12, Southampton-buildings, W.C.:—

Charles Rogers, High-road, Chiswick* £294

LOWESTOFT.—For work at the premises of the Young Men's Christian Association, London-road, Lowestoft. Mr. Herbert J. Green, architect and Diocesan Surveyor, Norwich:—

Chapman & Son	£1,409 0 0	G. Elsey	£1,300 18 10
C. R. Cole	1,370 11 0	Boddy & Son	1,275 18 6
J. S. Smith	1,332 9 0	Youngs & Son	1,246 16 1
		J. Ashby	1,199 0 0

MARKET HARBOROUGH.—For the erection of the new cattle market, for Market Harborough Urban District Council. Mr. H. G. Coales, A.M.Inst.C.E., Bank-chambers, Market Harborough:—

Contract No. 3.

G. Martin	£5,786	Hacksley Bros.	£5,447
E. Dexter	5,623	Richardson & Son	5,419
Goodman & Murkett	5,597	J. Wingrove	5,395
Brown & Sons	5,585	G. H. Eastwood	5,311
G. Henson	5,585	T. Hickman, Market Harborough*	5,225
W. W. Brown	5,537	Co-operative Builders	5,167
Herbert & Sons	5,497	C. Wright	5,000
J. Main	5,468		

[Architect's estimate £5,107.]

NEWENDEN (Kent).—For additions, alterations, and repairs at the White Hart inn, for Messrs. Edwin Finn & Sons, Ltd., Lydd. Mr. Thurlow Finn, architect, High-street, Guildford, Surrey:—

D. & G. Keeler	£488 7 6	A. Comport, Northiam*	£430 0 0
F. W. Parker	458 0 0		

RAWCLIFFE (Yorks).—For the erection of a house for Mr. Cox. Mr. E. B. Tudor, C.E., Burlington-crescent, Goole:—

F. Backhouse, Jefferson-street, Goole† ..£212 10

SANDWICH.—For alterations to sewage disposal works, Ash, for the Eastry Rural District Council:—

Denne & Son, Deal £2,000

WIGAN.—For the erection of a church, Standish-gate. Mr. F. W. Dixon, architect, Trevelyan-buildings, Manchester:—

Wilson & Co., Caroline-street, Wigan* £4,990

LONDON SCHOOL BOARD TENDERS

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect:—

* *Recommended for acceptance.*

NEW SCHOOL (Ensham-street site, Mitcham-road, Tooting).—The Board of Education have sanctioned the erection of a school on the Ensham-street site, Mitcham-road, Tooting, to provide accommodation for 900 children, upon which site three temporary iron buildings have been erected and are now in use. The provision of a manual training centre for twenty boys has also been sanctioned in connexion with this school. Finished plans of a school to accommodate 962 children (viz., boys, 320; girls, 320; infants, 322), together with the manual training centre, were passed by the Committee on October 21, 1901. The school is a three-story building, and contains the following accommodation:—Halls: Boys', 58 ft. by 30 ft.; girls', 58 ft. by 30 ft.; infants', 58 ft. by 30 ft. Classrooms: Boys', 48, 48, 48, 48, 48, 48, 40, 40; girls', 48, 48, 48, 48, 48, 40, 40; infants', 48, 48, 48, 48, 50, 40, 40. Drawing and science room, 1,247 ft. area. Manual training centre for 20, with power of extension to 40. Heating by open fires and stoves. A house for the schoolkeeper is also included in the plans. Area of site, 93,654 square feet. Playgrounds—area per child: Boys, about 100 square feet; girls and infants, about 68 square feet:—

Wallis & Sons	£28,692	F. & H. F. Higgs	£26,120
Lawrance & Sons	27,830	Lathey Bros.	26,081
Simpson & Son	27,498	Holliday & Greenwood, Ltd.	26,071
Martin, Wells, & Co.	26,966	J. Carmichael	25,962
Holloway Bros.	26,940	Johnson & Co., Ltd.	25,600
Garrett & Son	26,869	J. & M. Patrick	25,549
Leslie & Co., Ltd.	26,348	Lorden & Son*	25,522
Stimpson & Co.	26,130		

ADAPTATION OF BUILDING for Residential School for Blind Boys (Linden-lodge, Wandsworth Common):—

Hooper & Son	£5,634 10	W. Hammond	£3,640 0
General Builders, Ltd.	4,354 0	J. Carmichael	3,590 0
Marsland & Sons	4,020 0	Lathey Bros.	3,563 0
J. & C. Bowyer	3,694 0	Garrett & Son	3,415 0
J. & M. Patrick	3,657 0	E. Triggs*	3,412 0

ADDITIONAL CLOAKROOMS (Caledonian-road School, Islington):—

T. L. Green	£237	Stevens Bros.	£209
Williams & Sons	233	Marchant & Hirst*	197

ALTERATIONS TO CLASSROOMS IN GIRLS DEPARTMENT (Monteith-road School, Old Ford-road):—

T. H. Jackson	£285 0 0	W. Martin	£232 0 0
Stevens Bros.	278 0 0	F. & F. J. Wood	226 0 0
J. T. Robey	262 5 0	Shurmur & Sons, Ltd.	225 0 0
F. Bull	252 0 0	G. Barker	221 10 0
Barrett & Power	241 0 0	London School Furniture Co.*	216 10 0
Bruce, Croom, & Co.	237 6 10		

DIVIDING ROOM B in each Department by glazed partition, Deal-street School, Mile End New Town:—

T. H. Jackson	£675 0	Marchant & Hirst	£395 0
London School Furniture Co.	592 5	Johnson & Co.	388 10
Willmott & Sons	480 0	General Builders, Ltd.	347 0
J. T. Robey	465 0	A. J. Sheffield	336 0
Bruce, Croom, & Co.	440 0	Vigor & Co.*	329 0

DRAINAGE AND SANITARY WORKS (Vittoria-place School, Barnsbury):—

Johnson & Co.	£3,262 16 0	Stevens Bros.	£2,996 0 0
T. Cruwys	3,248 0 0	McCormick & Sons	2,989 0 0
Killingback & Co.	3,160 0 0	Lawrance & Sons	2,879 0 0
Marchant & Hirst	3,156 0 0	Williams & Son	2,782 0 0
G. Neal	3,107 0 0	Willmott & Sons*	2,527 0 0
R. P. Beattie	3,002 5 1		

ELECTRIC LIGHTING (Northwold-road New School):—

Vaughan & Brown, Ltd.	£489 0	Lund Bros. & Co.	£368 0
Comyn, Ching, & Co., Ltd.	412 10	Rashleigh, Phipps, & Co.	368 0
Drake & Gorham, Ltd.	392 0	Marshall & Woods	322 0
Watson & Co.	372 15	Wells & Co.	314 0
		J. C. Christie*	310 0

EXTERNAL STAIRCASE AND BRIDGE to the Manual Centre, and other works (Culloden-street School, Brunswick-road):—

Grover & Son	£519	F. Bull	£424
T. H. Jackson	496	F. & F. J. Wood	355
Lawrance & Sons	480		

HAGUE-STREET SCHOOL (Bethnal Green).—Partition, &c.:—

Willmott & Sons	£257	F. Bull	£411
T. H. Jackson	477	G. Barker	408
Dearing & Son	475	W. Martin	395
Bruce, Croom, & Co.	458	A. J. Sheffield*	331
Burrett & Power	429		

HEATING WORKS (St. John's-road School, Hoxton:—

Cannon & Sons	£243 0	J. Grundy	£147 0
G. Davis	210 0	Skinner, Board, & Co.	137 0
Brightside Foundry and Engineering Co., Ltd.	177 0	J. & F. May	129 0
R. Clarke	162 0	Duffield & Sons	125 0
J. Esson	148 10	G. & E. Bradley*	119 0

LAUNDRY CENTRE (Ancona-road School, Plumstead):—

W. Downs	£1,857	Mitchell & Son	£1,595
F. & H. F. Higgs	1,847	Marsland & Sons	1,563
Johnson & Co., Ltd.	1,721	Kirk & Randall	1,529
Wallis & Sons	1,684	E. Triggs	1,526
Bulled & Co.	1,674	J. & C. Bowyer	1,514
Garrett & Sons	1,657	Johnson & Co.	1,508
Smith & Sons, Ltd.	1,597	T. D. Leng*	1,487

PARTITIONS IN BOYS' AND GIRLS' DEPARTMENTS (Stanley-street School, Deptford):—

G. Kemp	£1,250	General Builders, Ltd.	£997
J. and C. Bowyer	1,188	Rice & Son	937
Lathey Bros.	1,179	E. Triggs*	919
Marsland & Sons	1,085		
Garrett & Son	1,028		

PAINTING.—The exteriors of the following schools will be painted between May 24, 1902, and June 21, 1902:—

ANCONA-ROAD:—

Hayter & Son	£235 0	W. Jolly	£163 10
J. Harries	234 0	Gibb & Co	145 0
H. Groves	175 0	E. Proctor*	144 0

CHATHAM-GARDENS:

Collis Willmott & Son	£179	G. Barker	£135
W. Martin	150	Chessum & Sons	128
Staines & Son	138	Barrett & Power*	126

COTTENHAM-ROAD (old portion and enlargement):—

G. Kirby	£195	Stevens Bros.	£178
McCormick & Sons	194	C. & W. Hunnings	152
Marchant & Hirst	191	Bate Bros.*	143

EVERINGTON-STREET:—

Hudson Bros.	£250 10	Bristow & Eatwell	£125 0
W. Hornet	161 0	S. Polden	125 0
C. Curd	160 10	W. Hammond	120 0
C. Gurling	147 0	Chinchen & Co.*	114 10
Lathey Bros.	147 0		

[See also next page.

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Repairs to schools on revised schedule of prices:—

Division.	Groups.	—	Percentage on the Schedule for work comprised in a Repairs. Measured work.	b Sanitary. Measured work.	c Daywork.
Finsbury	3 & 4	*Barrett & Power, 104, Queen Victoria-street, E.C.	20	20	10
,,	5 & 6	*Dearing & Son, Clarence Works, Halliford-street, Islington, N.	15	25	15
Hackney	1	Do. Do.	15	25	15
,,	2	*Barrett & Power, 104, Queen Victoria-street, E.C.	20	20	10
,,	3, 4, 5, & 6	*Johnson & Co., 97 & 99, Southwark Bridge-road, S.E.	15	20	10
Marylebone	1 & 2	*Chinchen & Co., Harrow-road, Kensal Green, N.W.	15	20	15
,,	3	*M. Pearson, 31, Old Compton-street, Soho, W.	15	15	15
Tower Hamlets	1	*A. W. Derby, Crown Works, Dalgleish-street, Limehouse, E.	17½	17½	10
,,	2	*Gibb & Co., West India Dock-road, E.	20	25	10
,,	3	*Vigor & Co., King-street, Poplar, E.	10	10	10
,,	4	Do. Do	7½	7½	7½
,,	5	Do. Do.	7½	10	10
,,	6 & 7	*Johnson & Co., 97 & 99, Southwark Bridge-road, S.E.	15	20	10
Gordon House Girls' Industrial Home	—	*Soole & Son, Richmond	5	5	5

FLORA-GARDENS:—

G. H. Sealy	£190 0	S. Polden	£139 10
W. Hornett	179 0	Chinchen & Co.	109 15
W. R. & A. Hide	158 5	Bristow & Katwell*	97 15

HACKFORD-ROAD (both schools):—

J. Watkins	£419 0	Rice & Son	£189 0
H. & G. Mallett	352 10	E. Triggs	165 0
J. Appleby	210 0	Maxwell Bros., Ltd.*	149 0
Holliday & Greenwood, Ltd.	208 0		

HASELRIGGE-ROAD:—

H. & G. Mallett	£389 0	Garrett & Son	£151 0
Lorden & Son	188 15	Maxwell Bros., Ltd.	151 0
Rice & Son	167 0	E. B. Tucker*	150 17
E. Triggs	155 0		

LATCHMERE (B, G, and I):—

J. Watkins	£369 0	Holliday & Greenwood, Ltd.	£178 0
Johnson & Co., Ltd.	262 0	E. B. Tucker	164 10
E. Flood	236 0	E. Triggs*	150 0
Rice & Son	211 0		

PAKEMAN-STREET:—

McCormick & Sons	£161 0	Bate Bros.	£121 17
Grover & Son	144 0	F. W. Harris	119 0
G. Kirby	129 0	Stevens Bros.	118 0
Marchant & Hirst	122 0	C. & W. Hunnings*	115 0

SAYER-STREET:—

J. C. Chalkley	£214 0 0	Sayer & Son	£163 0 0
W. Banks	188 16 6	J. Appleby	162 0 0
J. Greenwood	188 0 0	W. V. Goad*	158 0 0

SWAN-STREET:—

J. Greenwood	£188 0	J. F. Holliday	£115 0
Outhwaite & Son	177 0	Haydon & Sons	104 10
T. Willson	160 0	Johnson & Co.*	95 0

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VOL. LXXXII.—No. 3004. MAY 24, 1902.

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The Duchess's Boudoir, Welbeck Abbey ..... Messrs. Ernest George & Yeates, Architects.
Battersea Working-class Houses Competition: No. 3 of the First Premiated Plans ..... Messrs. Smith & Weald, Architects.

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Parliament and Trades-Unions.

THE recent discussion in the House of Commons on the legal position of trades-unions is probably the commencement by these bodies of a Parliamentary campaign, in which they may possibly in the end be successful. The present House of Commons is distinctly a Tory body, but nevertheless a motion that legislation is necessary to prevent workmen being placed by judge-made law in a position inferior to that intended by Parliament in 1875 was only defeated by twenty-nine votes. This is very significant, and it has always to be borne in mind that the trades-unions include a large number of electors, and that in many constituencies they can turn an election one way or another. If, therefore, at the beginning of a campaign, they have what may be called such a favourable defeat, it is extremely probable that in the long run they will be successful in their efforts to alter the law.

The ostensible reason for this debate was the recent decisions of the House of Lords, first, defining what kind of combination by these societies is wrongful; and secondly, deciding that trades-unions are capable of being sued in respect of such acts, and their funds made liable for damages. Mr. Beaumont's motion was couched in almost humorous terms: "That legislation is necessary to prevent workmen being placed by judge-made law in a position inferior to that intended by Parliament in 1875." The legislation referred to was legislation which for the first time legalised such combinations as trades-unions; but, as was pointed out in the judgments in "Taff Vale Railway *v.* Amalgamated Society of Railway Servants," was certainly not intended to bring into creation numerous bodies of men capable of owning great wealth yet free from absolutely all responsibility for the wrongs they may do other persons by the use of that wealth. From legalising an institution to rendering it incapable of being called to account for any wrong, is a wide step, and one which any legislator would hesitate to take under any circumstances, and more especially with regard to trades unionism, which in the past in the heat of party struggle has shown entire disregard for all those economic considerations which form such an important element in our retaining any pre-eminence as a commercial country.

A good deal was said on both sides about so-called "judge-made law," as if it were something which was illegal. As a matter of fact, large portions of English law are built up from time to time by judicial decisions. It is this which gives it its elasticity, and judge-made law is nothing more than the application of well-understood principles to new states of circumstance. Trades-unions have become so strong and powerful that it is obvious they control the acts of their individual members so that they become principals in the transaction, and, as such, liable for damages which their instructions may have inflicted on third persons. In truth, this view of the Law Courts is a tribute not only to their power, but is an indication that they have taken a place among recognised corporations, and we doubt very much whether Parliament will ever alter the law in principle.

For the protection of a large number of the members of trades-unions legislation would seem to be desirable for the purpose of separating the funds of the unions. The Attorney-General said that when trades-unions deliberately elected to blend the funds it was preposterous for them to say it was a hardship that those funds should be made liable in actions against trades-unions. Upon this point we cannot agree with the Attorney-General, because there are large numbers of workmen who subscribe to and are members of trades-unions as benefit clubs, and not as fighting organisations. These men ought to be protected, and it would, therefore, appear desirable that it should be made obligatory for what we may call benefit clubs and campaign clubs to be kept separate. If this were done, subscriptions for sick purposes would not be liable for damages if obtained against a trades-union, and it would be equally illegal for officials to use them for the purpose of carrying on a strike against employers. There is no reason why workmen, if they choose to subscribe for the purpose of strikes, should not be allowed to do so; but the recent judgment of the Courts, and this late discussion in Parliament, seem to show that the time has now arrived when the question of compulsory division of trades-union funds should be seriously considered by Parliament.

The other point which has now come very much to the front is that of what was called in the debate "peaceful picketing." Here, again, it would appear that the law is in no way altered by recent decisions, but it has only been applied to a new state of facts. Peaceful picketing in itself is clearly not illegal, but it is easy to see that what is nominally peaceful persuasion may be as dangerous to individual liberty as actual violence. In 1891 it was held that "intimidation" meant intimidation in the shape of threatening physical violence or something of that kind; but the judges have now gone further, and consider that peaceable persuasion, coupled with watching and besetting a person's house, is illegal. It is perfectly obvious from the experience of mankind that if you collect a large number of persons about a man's house who are hostile to him, they may, though outwardly peaceable and doing no act of violence, yet by their very appearance threaten his well-being; and the mere assembling of a number of persons about a house or a manufactory is in itself really a contradiction to the term "persuasion"—in other words, it is a fiction that when two or three hundred workmen assemble about a place of business and abstain from violence they are merely engaged in a kind of academic discussion with so-called "blacklegs"; one knows perfectly well that the object of the demonstration, even if not a word is uttered, is to intimidate. Such action is quite different from purely peaceable persuasion, and neither that nor combination is really interfered with by the recent judgments. What the law has really done

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is to apply common sense to acts which even Lord Macaulay's traditional schoolboy would have recognised as a species of intimidation, and not as mere persuasion. For the present Session the subject is at an end, but we cannot doubt that in future Parliaments we shall frequently hear of it.

PAINTING AND SCULPTURE AT THE PARIS SALONS.

BY H. HEATHCOTE STATHAM.

ALTHOUGH the vast spaces of the Old Salon contain many indifferent and some vulgar paintings—vulgar in the artistic sense, that is to say—there is a sufficient leaven of fine pictures to justify one in classing this as one of the best exhibitions for some years past. The liberality and enlightenment of the French Government and the Paris Municipality in regard to the fostering of decorative art on a great scale is exemplified in the presence of several great canvasses intended for the decoration of public buildings. The central work in the large gallery of the Palais des Beaux-Arts is the immense coloured cartoon by M. J. Paul Laurens for execution at the Gobelins Tapestry Works, representing "Glorification de Colbert," of which a monochrome reproduction was given in our issue of April 19. The colour is a little heated and violent in parts, but this may impress one less when it is carried out in tapestry, a decorative material which rather demands strong colour, and in which the rough texture forms a kind of softening and harmonising element. The opinion which we expressed when publishing the design, that there was a certain degree of absurdity in the contrast between the realistic figure of Colbert in the costume of his day, and the draped and nude symbolical figures by which he is surrounded, seems rather to be shared in Paris. In the saloon at the opposite side of the range of galleries are two still larger pictures by M. Detaille, commissions from the Municipality of Paris for the decoration of the Hôtel de Ville. One of these represents the enrolment of volunteers on the space in front of the Pont-Neuf in 1792; the other the reception, by the Municipality of Paris, of the troops on their return from the campaign of 1806-7 in Poland. Neither of these works is decorative in style, except in the sense that they are painted in a rather harder and flatter manner than this artist employs for his highly-dramatic easel pictures; their interest is perhaps admittedly historic as much as artistic. Both are crowded with figures, all painted with the greatest care; but the scene of the reception of the troops is by far the most effective in a pictorial sense; the artist has had the advantage of being able to oppose two strongly-contrasted groups, both in brilliant and picturesque costumes; the members of the municipality in their civic gowns on the left, the body of troops on the right; while on the extreme right, on a temporary orchestra draped in red, is a choir of young women in white singing a hymn of welcome, accompanied by harps. With these combinations an artist of M. Detaille's talent could hardly fail to produce a striking and effective picture.

It is well thus to employ the art of painting to record on the walls of public buildings striking events in national history; yet one cannot but feel that it is not in such works that painting seeks or can gain her highest intellectual triumphs: they are essentially pictures painted in the first place for the story, to which artistic treatment is only an auxiliary. In the realm of pure art the great triumph of the Old Salon this year is to be found in M. Gervais' beautiful work, "Les Grâces Florentines." M. Gervais is the finest painter of the nude whom the French possess at present—which is to say that he is the finest in the world; but he treats the nude figure in a grand and monumental style, and yet with a fulness of life and warmth and colour; he is as far from the cold classicalities of M. Bouguereau as from the realistic indecorums of M. Lerolle (one of whose pictures in the New Salon would hardly be tolerated in an English exhibition) or the rampant *bravura* of M. Lalire, whose "hashes of nudes" are an annually recurring curiosity of the Salon. The idea of "Les Grâces Florentines" evidently is to suggest what the Three Graces would have been had they been a Renaissance instead of an antique conception. Backed by a semi-circular architectural alcove are three beautiful young women, appropriately represented with more warmth of colour and vivacity of manner than we connect with the idea of Greek Graces; one is seated in the centre, backed by an ermine mantle; the two others, standing at each side, shower upon her a libation of the flowers from which Florence takes her name; the Boboli gardens, or something similar to them, form a vista in the rear, seen through the columns of the alcove. As a creation of pure beauty, it is one of the finest pictures of the year, and almost makes one forget Mr. Sargent at the Academy.

It is rather a boast of the French that they judge pictures for their artistic value independent of the subject; and certainly at the Salon one hears less of that question, "What is it about?" which seems to form the ultimate end of a picture with most of the Royal Academy sightseers. But the French crowd is not always so superior after all. It has occurred to M. Gérome, for instance, that after the slaughter of Christians by wild beasts in the arena of the Colosseum, there came the moment when the animals had to be driven back to their dens; and accordingly he has painted "La rentrée des félins dans le cirque;" the last spectators are seen leaving their places, and the attendants driving back the lions and tigers with heavy whips, while the bleeding bodies of some of the victims lie in the foreground. Round this horrible picture there is a continual crowd. A Frenchman endeavoured to persuade me that there was always a crowd round M. Gérome's pictures; but I have seen all his Salon pictures for many years, and never a crowd before them till now. It is therefore the sensational nature of the subject which collects the crowd; so that our neighbours are not so much more enlightened than ourselves after all. A remarkable picture of course it is, but a horrible one; and this seems to be the attraction. M. Bouguereau seems to have felt under the necessity of rousing up his public a little, and so makes a bid for attention and admiration by a singular picture, "Les Oréades," a solid stream of nymphs flying upwards, looking as if they were poured out of some receptacle for wood-nymphs; a masterpiece of drawing of the multitudinous small figures, the colour cold and the texture hard as usual; doubtless an exceedingly clever thing, yet with no interest beyond the cleverness of execution. Two pictures intended for the New Sorbonne may pass on that account as decorative art, though in fact they are realistic rather than decorative; M. Brouillet's large painting of "Renan on the Acropolis at Athens," which is really a view of the Parthenon, and a very good one; and M. Toudouze's "Un cours de Théologie," a theological lecture in the fourteenth century, in the courtyard surrounded by the old buildings, with students squatted on the flags around a red-gowned Professor; a very clever picture, full of vigour and character. M. Dufau's "Automne," which has been purchased by the State, is a really decorative picture (though not so described), and a rather remarkable one for colour and composition; landscape and figures of a remote golden age; even the legendary centaur is seen in the background; the two main figures in the foreground are very finely designed and grouped, and the whole is suffused with a golden glow symbolical of autumn.

Among the painters who love to put an intellectual meaning into their pictures, M. Ridel, the painter of the romance of modern life, is less happy than usual in his "Prélude d'Amour," the first exchange of sentiment between a couple in a boat on the lagoon at Venice; he has done much better things than this, as regards the interest of the figures, and the water is badly painted; indeed, one is indebted to the catalogue for the knowledge that it is water. M. Henri Martin, *pointelliste* and painter in general of decorative and symbolical compositions on a large scale, is also somewhat disappointing in his "La Muse du Peintre," a single draped figure looking thoughtfully at an easel, or rather a picture on it; this is not a commonplace work either in colour, style, or conception, but the appearance of the easel suggests too much the realistic surroundings of a studio, which are out of keeping with the general idea of the picture. M. Maignan exhibits a large and rather powerful picture of the temptation of Eve, with a very remarkable conception of the serpent. Coming back to realistic subjects, M. Hoffbauer exhibits a pathetic representation of a "Révolte de Flamands"; he does not suggest what revolt or at what date, but the picture of this small band of ill-clad peasants marching along the snow-covered road amid the dreary winter landscape, armed with scythe-blades fixed to the ends of poles, and blowing their fingers with the cold, is a bit of historical realism probably only too true; and it is one of the missions of painting (in spite of the *l'art pour l'art* school of critics) to assist our conception of the life and events of past times, even if the result be not altogether "decorative." Mme. Demont-Breton's two little children on the seashore examining jelly-fish ("Les Méduses Bleues") would pass for an admirable picture save by comparison with some previous works by the same hand. M. Roybet dresses up in a scarlet cloak the same "robustious" model whom we have seen in two galleries in London this season, and calls him "Le Vainqueur de Lépante"; but for this sort of picture, clever and even daring as it is in colour and force, one title is as good as another; "L'Homme à Man-

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teau Rouge" would do just as well; it is the materialism of painting in full cry. M. Mercié, the great sculptor, like his late colleague Falguière, wishes to show, in "La Paresse," that he can paint the figure as well as model it; the painting is very pretty; perhaps hardly more than that. Among purely and professedly decorative painters M. Marioton, who has taken the ceiling as his special province, exhibits one of his light and floating compositions of this class, under the title "Sommeil"; he has the merit of having realised the right kind of treatment for figure subjects for a ceiling, which should not stand, nor sit, but float, as it were, in space; the only kind of treatment by which one can keep the ceiling light enough, and at the same time avoid the puzzle to the eye of painting figures as standing in a horizontal position, and the confusion as to which is the right side up of the picture. The kind of trellis decoration in the corners of this ceiling gives an individuality to the design, but it is in a taste a little too decidedly Parisian (the ceiling is one for a private house). Another painter of residential decoration, M. Saintpierre, paints for the wall of a vestibule, cut in the centre by a doorway, "Le lièvre et les perdreaux," the hare in an open landscape on one side of the doorway, the partridges in a wooded landscape on the other side; there is a want of point about it, and too much perspective for decorative effect; but it is pretty, and the hare is admirably studied.

There are a good many fine portraits in the Salon, notably M. Chartran's of Mrs. Theodore Roosevelt; M. Henner has for once forsaken his nymphs with undecided contours to paint a portrait of an old lady in a dark dress, the face being the only light in the picture, which is effective enough; and two portraits of ladies by M. Humbert are remarkable for their fine broad style of treatment, which, both in the figures and in the landscape accessories, reminds one rather of Gainsborough. And under the title "Midi" M. Grun has a large still-life painting, with a great brass pot, a porcelain soup-tureen, and divers vegetables, which, in its perfection of touch and execution, is quite the sublime of still-life painting; a realism produced not by hard and minute finish but by a consummate knowledge of lighting, colour, texture, and of the effect of every touch. Whether the result is worth the expenditure of so much talent is perhaps a question; but of its perfection in its way there can be no doubt.

But it is in landscape that the success of this year's Salon—always excepting M. Gervais' work before described—is most remarkable. The French cannot paint the sea; they have no sympathy with it, and seem hardly to have studied it, but paint it out of their inner consciousness; and here the country which has produced Moore and Brett, and Mr. Hook, Mr. Wyllie, and Mr. Somerscales, may afford to be proud. But in landscape, where is the best Academy picture beside the best at the Salon? Even in the way of mere realistic power there are things to wonder at. There is far too much in English landscape painting of mere aim at realism—the kind of success which appeals most to the English public; and realism is not the highest end of landscape-painting. Yet even in the way of mere realism what is there among the popular landscape-painting at the Academy to compete with such a picture as M. Hareux' "Bord de l'Isère—effet le lune"; a State commission, by the way, probably for presentation to the town of Grenoble, at which the scene is laid. Look at the moonlight on the towing-path in the foreground, and the shadows across it; could anything be more perfectly successful in its way? Another equally complete piece of realism, in a different kind of scene, is M. Biva's "La Rivière—Villeneuve-l'Etang;" the foliage and the lights on the grass actually deceptive. To be deceived is not what one should want in landscape; but it people do want it, they will not get it better than this. When, however, we come to such a picture as M. Harpignies' "Souvenir d'Antibes," we are of course on a far higher level of interest. Here we have the double interest of the perfectly truthful suggestion of Nature combined with the translation of it into the painter's own splendid and free style, the result of a perfect sympathy with Nature combined with an exact perception of what pigments can do in expressing the character and feeling of forest and distant sea. The breezy surface of the sea is not simulated, only indicated by a few touches, slight enough apparently in themselves, but of which none has been inserted without thought of its meaning. This is the perfection of landscape art. M. Didier-Pouget belongs to a more realistic school; his large painting "Le Matin—Vallée de la Corrèze," is a class of picture which he has produced before; his favourite materials are in it—the high lawn in the foreground with the heather in flower, the distant valley half shrouded in mist; the style is somewhat more direct, somewhat harder, than that of M. Harpignies; but it is a work of immense force and power. In his other picture, "Crépuscule—Etang de Ruffand" (also at Corrèze) he has given a solemn evening effect, a dark lake in the foreground, dark masses of trees behind it, through which the western light shows faintly. It may be just a trifle scenic; but it is a scenic effect of great beauty and power, in which the artist may be said to have succeeded in producing a picture which raises the same emotion in the mind as the actual scene would raise; and can landscape achieve much more? Among the many other landscapes mention should be made of the scene in the park at Fontainebleau by M. Tenré, with its buildings and its row of trees in the foreground, flecked with the sunlight; of M. Planquette's courageous attempt to paint a landscape flooded with western light; and of M. Cabie's grand and menacing picture "L'Approche de l'Orage," which reminds one of the thunderstorm in Thomson's "Seasons"; a wonderfully true and powerful representation of coming storm, with its mass of cloud, the roughened sea, and the trees, with their leaves blown by the wind, seeming almost to glitter against the background of cloud. The whole picture is in a broad and grand style, no details being allowed to intrude upon or weaken the general presage of storm.

The New Salon, though it includes a certain number of fine works, contains no pictures equal to the finest in the Old Salon, and in sculpture it is nowhere in comparison. M. Rodin, in his fine bust of Victor Hugo, erected on a column, for once condescends to send in a finished work, with no rough unworked surfaces and no skewers. The remainder of the sculpture in the New Salon consists of odds and ends, many clever, some eccentric. The exception is M. Saint-Marceaux's four panels in very low relief representing "The Four Seasons"; these are intended evidently as architectural decoration, though it is not stated for what position. Among the larger paintings there are a good many large decorative pictures, but none of them of very striking merit except M. Dubufe's "À Gounod," a large composition in which the figure of the composer playing on a piano, and a very graceful seated figure of a lady, turned away from the spectator, listening to him, are oddly combined with angels playing violins and a reclining nude figure, possibly the Muse of music, in the foreground. Nevertheless this is a fine and really decorative picture, and the figure of the seated lady is an inspiration. The "note" of the new Salon, of course, is supposed to be the use of painting to convey impressions rather than to simulate facts; it professes to be more intellectual in its aims than the Old Salon, and to suggest new departures in art. But this character is not very consistently kept up; the walls must be filled and the ordinary spectator attracted; and M. Gervex's large painting of the celebrated dinner to the Maires of France (probably an official commission), seems out of place here, and quarrels sadly with the supposed aims of the exhibition. Nor can one see that M. Carolus-Duran does much to advance the artistic ideal in his large portrait group of himself and his family through three generations; nor is it, indeed, equal in brilliancy of execution to the type of portraits of *mondaines* by which he has principally made his fame. In fact, the adhesion of M. Carolus-Duran to the New Salon is somewhat inexplicable, and is probably due to considerations rather of artistic politics than of art: his artistic affinities are certainly with the Old Salon. M. Courtois exhibits a large painting, not at all however of the domain of "L'Art Nouveau," of Adam and Eve in Paradise, in which the Adam at all events is a very fine figure, but not at all the lighting of full daylight—*plein air*—which is supposed to be part of the creed of the New Salon; this again is a picture that one would have expected to find in the other division of the Palais des Beaux-Arts. The *plein-air* treatment of the nude is rather to be seen in M. Lerolle's admirable "Baigneuses," a piece of pure and unaffected art; pity he should have spoiled the impression by the vulgar "Etude" hung alongside of it. The desire to penetrate into the essential characteristics of a scene is well illustrated in M. Cottet's curious and striking work "Messe basse en hiver (Bretagne)," where the black-cloaked figures struggling along the wintry road have a rude pathos which quite distinguishes the picture from the ordinary type of scene of rustic life.

There are no landscapes in the New Salon of anything like the power and scale of the finest of those in the Old Salon; but on the other hand it may be observed that the wider spacing and less crowded hanging in the New Salon allows their due effect to sundry small landscapes of great beauty, which would be crushed, as it were, amid the crowded canvases of the larger exhibition. Among these are M. Damoye's, especially "Les Bruyères Noires;" M. Ménard's fine view

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of the desolate walls of Aigues-Mortes standing among the marshes; M. Thaulow's "Automne Doré," and two or three landscapes by M. Lhermitte, which indeed, though not large in scale, are broad and powerful enough to hold their place anywhere. Among the portraits is a fine quarter-length of the military-looking personality of M. Gérome, dressed in that green be-palmed livery of the Institut over which Daudet is so sarcastic in "L'Immortel."

The great crowd of sculptures in the central court of the old Salon shows an extraordinarily high average of work for such a numerous collection; and while there are fewer examples of eccentricity and love of violent action and sensational subjects than last year, on the other hand there is perhaps no work of so high and intellectual a cast as one or two of the last year or two. The great attraction to the average spectator is M. Puech's polychromatically constructed figure, "La Pensée"; the use of differently coloured marbles for quasi-realistic effect is not the highest form of sculpture, but of the exquisite beauty and finish of this figure there can be no question; the face really seems to think. M. Gérome has, up in the gallery, a slightly coloured figure of a nude dancer playing with balls, clever to a surprising degree, especially as the work of one who is essentially a painter, but absolutely destitute of sentiment or even of beauty. It would be impossible here to name all the works in sculpture which are worth serious attention. Among those which appeal more especially to the architect are the monument to the painter Louis Français, the joint work of M. Peynot (sculptor) and M. Godefroy (architect), a grand draped female figure backed by a stele; and the low-relief panels "Autumn" and "Winter" by M. Roux, two of the panels to be executed in Sèvres stoneware (*grès cérame*) for the decoration of the Chamber of Deputies. M. Récipon's "La Famille, la Loi," the centre portion of the great "L'Offrande à la Patrie" to be erected in the Panthéon, is too tumultuous in lines for a sculptured monument, and rather illustrates that tendency towards unrestrained line and action which is one of the dangers to modern French sculpture. M. Mercié's principal work is a group forming a monument to Gounod (in whom the French still devoutly believe), a group of figures composed in a kind of ascending spiral of main lines, and conveying the idea of their being uplifted and consoled by the composer's art; this is a fine work both in an intellectual and decorative sense, though it is not at M. Mercié's highest mark. M. Gustave Michel's colossal figure, or half-figure, "La Forme se degageant de la Matière," looks as if the sculptor had been influenced by M. Rodin; it is one of those rather doubtful efforts to express an intellectual idea which is beyond the limits of the art of sculpture; beauty and completeness of line are sacrificed to the expression of a thought; a principle which would soon wreck the art if carried far. There are other attempts among the sculpture at this expression of ideas which would find more fitting expression in literature, such as M. Moreau-Vauthier's "Le Mur: aux victimes des revolutions)," where the stones in the wall of a prison break out into wretched countenances of misery supposed to have been immured therein; pathetic, perhaps, but somewhat of a sculptural monstrosity. M. Icard's "The Foolish Virgins," a group beating frantically at the closed gate of Paradise, is somewhat violent, but one cannot deny its tragic power; it is better at all events than the set of tame figures in elegant attitudes of stage grief, which are sometimes seen as an illustration of this subject.

There are many things among the smaller works of sculpture well worth attention; beautiful modelling, as in M. Champeil's "Le Printemps de la Vie"; figures which have an element of poetic suggestion in them—a thought in stone or plaster; but it is impossible to enumerate them here.

NOTES.

Inspection of Temporary Wooden Stands.

IN our issue for March 22 we drew attention to the point decided in the case of the City Council *v.* London County Council that the power of granting licences for the erection of wooden stands to view the Coronation procession had been transferred, by the operation of the London Government Act, 1899, from the County Council to the new Borough Councils; and we pointed out that a doubt remained as to what was now the position of the District Surveyors acting under the jurisdiction of the County Council. Before the above-mentioned transfer it had been the practice for the County Council to issue these licences, with the condition attached that the stands must be erected to the satisfaction of the District Surveyors; but the Westminster City Council have now issued the licences with the condition attached that the stands must be erected to the satisfaction of their City Engineer. Under these circumstances a special case was stated for the opinion of the Court in the case of the Mayor, &c., of Westminster *v.* Watson (see page 527) raising the following three points:—1. Whether the powers, duties, and liabilities of the District Surveyors in respect to those structures (which fall within Section 84 of the London Building Act, 1894) have now been transferred to the City Councils and their officers. The answer of the Court to this question was that there had been no transfer, but the duties now devolved on the persons specified in the licenses. 2. Are these structures works of which the District Surveyors are entitled to have notice under Section 145 of the London Building Act, 1894? The Court answered this question in the affirmative. 3. Had the right to recover fees been transferred, or had it lapsed, or did it remain in the District Surveyors? On this last point the Court held that there had been no transfer; that where there was a *bonâ-fide* duty on the District Surveyors to inspect the structures to ascertain whether any provision of the Act had been infringed, they would be entitled to the fees; but seeing that the duties were diminished, the County Council should fix a lower fee than that fixed when the whole duties rested on those Surveyors.

Mechanical Plant in Office Buildings.

CONCURRENTLY with increase in the size of office buildings, the necessity arises for greater attention to the question of mechanical equipment. In this country tenants are left to provide themselves with various conveniences and comforts which in the United States are furnished by the proprietary, and it seems to us well that architects should endeavour to impress more fully upon clients the desirability of adopting the most perfect installations of engineering plant for all buildings erected. The Broad Exchange Building, New York, is the latest example of what may be done in this direction. It is of twenty stories, and includes more than 11 acres of floorspace. The steam and electric light plant are in the basement, the former comprising five water-tube boilers, each having 2,960 square feet of heating surface, and the latter five generating sets with an aggregate output of 550 kilowatts. The eighteen hydraulic lifts are served by three triple-expansion pumping engines, one compound pump for holiday use, and a similar pump for hoisting safes. A fire pump is included in the equipment and is cross-connected with the water service pump so that it may be used occasionally to keep the working parts in proper condition. Drips from the engine cylinders and the blow-off pipes from the boilers are connected to a blow-off tank, which, in accordance with the city regulations, is fitted with a cooling coil, so that water may be reduced to a proper temperature before discharge into the sewers. Water is supplied from the city mains, being passed through mechanical filters before entering the storage tanks, the total capacity of the filters being 800 gallons per minute. All the offices are warmed by radiators in which exhaust steam provides an economical and effective medium for the provision of heat, the circulation is accelerated by the adoption of the Paul system, and all condense water is returned to the boiler-feed pumps, which are under automatic control. Feed-water filters, grease-separators, and similar appliances are used wherever desirable, and there is a feed water-heater of 1,500 h.p. capacity. With a plant of the kind which we have briefly outlined, it will be readily understood that all the services necessary for the comfort of tenants can be provided at a minimum cost and with complete efficiency.

Electric Mains.

THE numerous fires that have occurred recently in the mains of some of the London electric supply companies have called attention to the fact that the ordinary direct-current systems of distribution are far from perfect We have called attention more than once to the extremely low insulation resistance of some of the older London networks, and pointed out that the continued expansion of these systems was attended with danger. More attention has lately been given to the question of insulation, but, unfortunately, higher insulation is secured in many cases by surrounding the mains with an inflammable substance which has been known also to give off an explosive gas when heated. During the last winter it has been a common experience for Londoners to see the roadways torn up for a distance sometimes of fifty yards, and to see numerous workmen taking out charred mains and putting in new ones with commendable rapidity. In a very able paper by Mr. J. C. A. Ward on continuous-current distributing mains, which was recently read to the Glasgow Local Section of the Institution of Electrical Engineers, an account is given of the various distributing sytems, and the drawbacks of several of them are clearly

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stated. He mentions the difficulty of regulating the potential of the mains, and points out that electric osmosis, whereby moisture is driven into the negative main, has to be seriously reckoned with. He is greatly concerned about the protection of the lead sheathings of the cables from the effects of stray currents, and the heavy rushes of current that ensue when a fault develops. Electricians are alive to the necessity of protecting the coverings of their own mains from the effects of electrolysis, and we suppose that the gas and water companies are also equally alive to this necessity. Mr. Ward mentions a case where a current flowed along the metal sheathing of a cable, and instead of going to earth through an earth plate provided for the purpose it went to the cast-iron junction box and arced through a layer of mud at the bottom of the box on to the water main underneath. The danger of the neutral wire being fused is mentioned, as the effect of this is sometimes to burn out a good many lamps in consumers' houses. Still, it seems to us that this is not a very serious danger, and as it is not likely to occur twice, it is easy to propitiate consumers by giving them new lamps.

Electric Railways in Italy.

THE paper read by Professor Carus-Wilson to the Institution of Electrical Engineers last week on "Electrical Traction on Steam Railways" was a timely and valuable one. He has made a careful study of the Italian railway systems, and has investigated the considerations which are leading the companies to electrify their lines. The network of steam tramways and economic lines that has spread over Northern Italy has seriously affected the receipts of the Adriatica Railway Co. To meet this competition the only thing to be done was to run a frequent service of short trains and to considerably reduce the fares. It was found that this could best be done electrically. Already sixty-six miles of track have been electrified between Sondrio and Lecco, where the electric trains are hauled by steam locomotives to Milan. They are worked on the Ganz high-pressure system, the current being generated at 22,000 volts, and carried by overhead conductors to nine transformer sub-stations where the pressure is reduced to 3,000 volts, and the current led by two trolley wires direct to the polyphase motors on the cars. The Mediterranean Railway Co. is equipping electrically the whole of the line from Milan to Gallarate, and thence to Varese and Arona. Like the Adriatica Co. they generate the electrical energy on a polyphase system at 12,000 volts at the power station, but the sub-stations transform it to direct-current, and the motors on the cars are wound for 650 volts. The actual expenses of operating the new electric services are greater than when steam was used and the fares have been reduced in many cases by 40 per cent., but as the traffic has increased fivefold the receipts have been doubled. It was pointed out that the cheapness of coal in this country more than outweighed the advantage that Northern Italy possesses in the way of water power. In the discussion, Mr. Steel, of the Great Northern Railway, said that the conditions and character of the traffic in England and Italy were widely different. It did not necessarily follow that increasing the traffic facilities led to a considerable increase in the traffic. The difficulties of managing goods traffic and high-speed passenger traffic on the same lines by electricity were shown, and he considered that laying new lines in the neighbourhood of London was quite out of the question, owing to the enormous appreciation in the value of land during the last thirty years. Professor Carus-Wilson said that the Italian companies first satisfied themselves by actual experiments as to what effect lowering fares and increasing facilities would have on the traffic, before they proceeded with the electrification of their lines. In his opinion there was a wide field for the use of electric traction in country districts in England, where everything seemed more favourable to success commercially than in Italy.

Electric Lighting *v.* The Settled Land Act.

THE law is getting into a state of confusion in regard to certain matters which may be paid for out of capital under the Settled Land Act under the head of improvements, which form additions to or alterations in building reasonably necessary or proper to enable the same to be let. Mr. Justice Joyce held that the provision of an electric lighting installation, exclusive of fittings, was an "addition" within the section, and might properly be paid for out of capital money. When this decision was given we noted its importance. Now we have Mr. Justice Buckley, in the case of *in re* Clarke's settlement, which was decided the end of last sittings, giving an exactly opposite decision. The only difference in the two cases was that in this case the lighting was required for a country house, in the earlier one for a town house. It is eminently desirable, therefore, that the Court of Appeal should decide this matter once and for all, and settle whether electric lighting comes within the meaning of the Settled Land Act, 1890.

The Church Building Society.

THE eighty-fourth annual Report of the Incorporated Church Building Society shows that, in spite of the recent unfavourable conditions for subscriptions owing to the war and the increased taxation, their income for 1901 is much larger than that for 1900, being 8,960*l.* for last year as against 5,402*l.* for the preceding year. This is certainly an indication that the recognition of the useful work of this Society is on the increase. During its existence the Society has been instrumental in aiding in the erection of 2,365 additional new churches, and in assisting in rebuilding, enlarging, or otherwise improving the accommodation in 6,235 other churches or consecrated Chapels of Ease. By these means more than two million additional seats have been secured, by far the greater part of which are for the free use of the parishioners according to law. The actual amount of money entrusted to the society and used in making grants toward the objects named has reached 895,683*l.* The Report acknowledges how much this Society is indebted to the Committee of Honorary Consulting Architects for examining and reporting upon the plans submitted to them at their monthly meetings; from which Committee they had the misfortune to lose during the past year the Chairman, Mr. James Brooks, who for many years had been a valued member of their body. A special resolution of sympathy has been sent to his relatives, and the vacancy on this Committee thus created has been filled by the election of Mr. Temple Moore; whilst Mr. J. P. Seddon, whose long and valuable services the Society gratefully recognise, has been appointed Chairman of the Committee.

Schools in the United States.

THE most important contribution to the new number of the *Journal of the Sanitary Institute* is a long report by Miss Alice Ravenhill on the teaching of hygiene in the schools and colleges of the United States of America, and on the design, construction, and sanitation of these schools. Miss Ravenhill was sent to America in the summer of 1901 to prepare reports for the Education Department, the Technical Education Committee of the West Riding Yorkshire County Council, and the Sanitary Institute. For the Education Department she inquired more particularly into the question of the teaching of domestic science, and for the West Riding County Council into the teaching of social subjects. The report for the Sanitary Institute contains a comprehensive account of the instruction given in hygiene, and of the application of the science of hygiene to the design and construction of school buildings, furniture, &c. The school-building regulations of the Indiana State Board of Health are quoted, and show in some respects a marked advance on those of our own Education Department; for example, the floor-space for each pupil must not be less than 15 sq. ft., and there must be a "well-lit and ventilated basement under entire buildings.' The requirements as to warming and ventilation are carefully specified, and must be sufficient to maintain a uniform temperature of "72 deg. during zero weather," and a change of air at least once in every twenty minutes. Three plans and internal and external views are given of the New York City Schools, designed by Mr. C. B. J. Snyder. They show a complete system of mechanical ventilation, and a free use of sliding partitions. The closets and lavatories in the schools visited by Miss Ravenhill do not appear to be as good or as well-arranged as the corresponding fittings used in this country, but it is a good feature that all plumbing in connexion with them is exposed to view. We have pleasure in drawing attention to this report; it contains much which is of practical value for architects.

Denton Hall, Yorkshire, W. R.

THE Denton Park Estate, near Otley, is about to be offered for sale. The property extends over 4,300 acres, yielding an estimated rental of more than 5,000*l.* per annum, and includes the Hall, Highfield, twenty-eight farms, and 1,100 acres of grouse moorland. The Hall, formerly known as Denton Castle, was built of an excellent stone quarried on the estate in 1778 for Sir James Ibbetson, Bart., after plans and designs by John Carr, of York. The house, commanding an extensive view over Wharfedale and the Wharfe, consists of a middle block, from behind which two quadrantal galleries communicate with the wings, the whole front being 280 ft. in length. The middle block has an octagonal bay at each side, and a principal façade, 105 ft. long, which embodies an Ionic tetrastyle portico with angle pediment and a bold cornice, carried up the two floors, above

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which is a balustrade alternately blocked and surmounted by five large draped urns. The dayrooms, which are spacious and 17 ft. high, are on the ground floor, which is gained by a wide flight of steps. On the first floor are sixteen bedrooms, the offices and servants' rooms being in the wings. Denton Castle had been from the beginning of the sixteenth century a seat of the Farefac or Fairfax family, some of whom, including Edward Fairfax, the translator of Tasso, are commemorated by monuments in Otley Church. The property was brought in marriage by Isabel, daughter and heir of Thomas Thwaits, of Denton, to Sir William Fairfax, Knt. The Castle was the home of Thomas, first Baron Fairfax of Cameron, and his son and grandson—the last-named being the third baron and the famous Parliamentary general. Henry Ibbetson of Red Hall, near Leeds, bought Denton in 1690. The Castle was burned during his lifetime, and having been re-instated was rebuilt by his descendant, who there made a valuable collection of "old masters," chiefly of the Dutch and Italian schools. In G. Richardson's "Vitruvius Britannicus," vol. i., 1802, are large-scale drawings of the principal floor, and of the south elevation.

Nos. 77-8, Pall Mall.

THESE two houses, standing between the Oxford and Cambridge Club and the offices of the Eagle Insurance Company, will shortly be adapted as a town residence for Prince and Princess Christian. They were acquired from the Crown for purposes of the War Office at the beginning of the present South African war, in the autumn of 1899, and have latterly been occupied as "grace-and-favour" residences by the Earl of Normanton and Viscount de Vesci, but have remained untenanted during some months past, being found unsuitable for official requirements. The Office of Works thereupon effected an exchange with the Land Revenues of the Crown in respect of Bushey House, Bushey Park, on behalf of the Royal Society, who greatly needed proper accommodation for their physical laboratories and cognate appliances.

Mezzotints at the Burlington Club.

AT the Burlington Fine Arts Club there is now on view a loan collection of 101 mezzotint plates by English engravers, mostly of the eighteenth century, the great period of mezzotint. The collection has been made at this time partly in view of the recently revived interest in this form of engraving, which had been almost entirely in abeyance from the early part of the last century. An exhibition entirely of mezzotint work has a rather sombre effect, and a study of it leaves one moreover, with the impression that there is less room for individuality of style and execution in this erasing process (as it may be called) of engraving, than in the methods in which the engraver works with positive lines. In wood engraving, for example, the influence of each man's style and handling is most distinctly recognisable; in the case of a collection of mezzotints, although collectors who have given their special attention to the subject may distinguish the handling of different artists, our impression was that it is exceedingly difficult to seize on any special qualities distinguishing the work of one engraver from another, the original texture of the surfaces having been formed in the mechanical preparation of the ground; the only decided conclusion we could come to was that the plates of Valentine Green are the finest and most artistic in the collection. As usual at the Burlington Club, the catalogue is very carefully got up in regard to information and critical suggestion; Mr. Wedmore contributes a short essay on "English Mezzotint Portraits," and Mr. W. G. Rawlinson an account of the technical process of mezzotint, which should be studied by visitors who wish to understand the conditions and possibilities of this form of engraving; and on a table in the room they will find the process further illustrated by the exhibition of an actual plate engraved for mezzotint. We are much indebted to the club for an exhibition which is interesting not only in an artistic but in a historic sense, including as it does many portraits of men and women of the eighteenth century concerning whom a good deal of biographical information is given in the catalogue.

M. Rodin in London.

THE worship of M. Rodin which is one of the latest fashions with a certain school of amateurs and art-critics took a concrete form last week in the shape of a dinner to the French sculptor, whose statue of St. John the Baptist has been added to the collection at the Victoria and Albert Museum. While we quite agree with Mr. George Wyndham, who took the chair on the occasion, that French sculpture ought to be better represented at South Kensington, we could imagine that a far better beginning might have been made than by the purchase of M. Rodin's very crude and unspiritual conception of "The Forerunner." M. Rodin is a sculptor of genius, but of an eccentric and wilful spirit, to which he has given so much the rein of late years, that his special pavilion near the Paris Exhibition in 1900 left the impression of a kind of sculptor's nightmare of distorted and unfinished fragments; and we hope that the threat of the repetition of this collection of curiosities in London will not be carried out. We confess that we prefer finished sculpture to unfinished, and we would far rather have seen a dinner given in honour of M. Mercié or M. Boucher, among French sculptors; the "Gloria Victis" of the one artist, and the "Antique et Moderne" of the other, are finer works, both in material beauty and in intellectual suggestiveness, than anything we know of by M. Rodin.

ARCHITECTURE AT THE ROYAL ACADEMY.—II.

CONTINUING our notes on the Royal Academy Exhibition, we may now pass in review the examples of domestic architecture which are to be seen:—

No. 1,366.—"Westhope Manor, Shropshire," by Mr. Guy Dawber, we have already mentioned in a previous article. The house is shown in a crisp pen-and-ink perspective drawing by Mr. T. A. Moodie.

No. 1,369.—"House at de Pary's-avenue, Bedford," by Mr. A. W. Prentice, is, as usual in this architect's work, of good artistic character with some originality, which in this instance takes the form of an immense plaster cove, starting from the level of first-floor window-sills and continuing to the eaves. Below the cove is a brick wall, and bay windows on each front run up to the eaves' line. The roof appears to be tiled with plaster gables and barge-boards, and a plan is included on the drawing.

No. 1,370.—"The Duchess' Boudoir at Welbeck Abbey," by Messrs. Ernest George & Yeates (illustrated in this issue), we have already noted, as we have their design in No. 1,374, "Foxcombe, Oxford."*

No. 1,375.—"A House in Oxfordshire," by Mr. Charles M. Pearce, is of traditional manor-house type in stone, with three bay windows carried up to gabled dormers, and is sufficiently true to the type to promise a successful effect. A plan of the house is given and the garden shown on perspective.

No. 1,377.—"Proposed Block of Four Houses, Hampstead," by Mr. Horace Field, is decidedly clever in plan. The houses are really in a terrace, but by recessing the two in the centre and projecting the end houses an open quadrangle is obtained, which is laid out as a formal garden, so that the effect of one large house is obtained. The two receding houses have their front doors side by side in the centre of the façade, and the end houses have theirs around the corner on the flanks. This disposition gives an opportunity for a departure in planning from the stereotyped limits of terrace houses, as is indicated by the plan on the drawing. There is no indication of the material, as the perspective is drawn in simple outline.

No. 1,380.—"House at Wimbledon," by Mr. William T. Walker, is shown in a scratchy perspective without a plan. The ground floor is of brick, the upper part rough cast; the building is slightly L-shaped, with a circular bay on the projecting wing. The eaves are at the level of the attic window-sills, which gives the opportunity for a rather unfortunate insertion of what appears to be coarsely modelled plaster ornament over the first-floor windows, which are adorned with jalousies. The whole design is reminiscent of the coarseness of some of our late seventeenth and early eighteenth century work.

No. 1,382.—"House at Ardingly, Sussex," by Messrs. W. W. Wheston and S. E. Castle, is a picturesque rendering of a Sussex type of house in half timber and brick, with a large blank chimney-stack on the front which, combined with the wide timber arched entrance, achieves a good modern reproduction of the type selected.

No. 1,383.—"House at Wrotham, Kent," by Messrs. Niven & Wigglesworth, is shown in a pen-and-ink perspective by Mr. E. L. Griggs, with a Dureresque background. No plan is given, but the design appears to be made up of a three-gabled plaster house, with extensions on each end for offices, thus gaining length and effect.

No. 1,388.—"Boat-House on Derwentwater," by Mr. W. Henry Ward, is a timber shed with a room over, and suggests in treatment a fusion of ideas from Normandy and Switzerland, resulting in an original and suitable design.

No. 1,389.—"House at Harpenden, back elevation," by Mr. Cecil Brooks, is a commonplace farmhouse mansion, with red brick ground floor and tiled hanging above. The chief feature of the elevation shown is a long, flat bay, which, if correctly drawn on the perspective, is circular at one end and square at the other, and is freakishly placed between the central lines of the two main gables, so that the meeting of their valleys comes over the centre of the bay.

No. 1,390.—"A Cheshire House," by Mr. Alfred E. Corbett, we have already noticed, as also No. 1,392, "The Royal Villa, Le-coq-sur-mer, Ostend," by Mr. Arnold Mitchell.

No. 1,394.—"Nos. 32 and 33, High-street, Marylebone," by Mr. William M. Brutton, is a coloured frontal perspective of a building consisting apparently of two shops with a common entrance for residential flats above, but as no plan is given we can but surmise. The elevation is to be carried out in red brick and stone, with green slate hanging to oriel window over the central entrance, and green jalousies to the other windows.

No. 1,396.—"Lodge Hill, Farnham, north front," by Messrs. Farquharson & Evill, is a long and low house of big cottage character, the first-floor window-sills being on the eaves' level, built of brick and plaster, with a stone projecting bay in the middle. This design is shown in a beautiful delicate drawing, almost conveying the idea of a dry point etching, by Mr. Evill, and the proper place is considered by the hanging authorities of the Academy to be on the skirting.

No. 1,398.—"Gardens of High Moss, near Keswick," by Mr. W. Henry Ward, is the per-

* Illustrated in the *Builder* for May 10.

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spective of a design for a formal garden, with a three-storied bungalow house in the distance. Half the garden is treated with paved walks, a central fountain, and parterre beds, with two gazebos at the angles, evidently the garden for showery weather, whilst the other half is made up of grass and yews, box hedges and alleys for a shady retreat in the heat of summer.

No. 1,399.—"Wood Rising, Rye, Sussex," by Mr. Philip Tree, is a pretty drawing of a pretty bit of a house, consisting mainly of a bay slightly corbelled over the entrance, and treated as a half-timber variation in a tile-hung upper story.

No. 1,401.—"Ascot Priory, New Wing, Ascot," by Mr. Leonard Stokes, we have already mentioned with appreciation.

No. 1,405.—"Stables, Goffs Hill, Sussex," by Mr. William A. Aickman, lacks originality and does not enthuse, being a respectable design of a quality which is no longer in the front rank, though in the youth of the Hanging Committee it might have been estimable. The plan is good and the glass roof over the yard is practical, and as an example of utilitarian architecture we are pleased to see that a place on the line is found for a design that, *quâ* beauty, does not rise above the commonplace.

No. 1,406.—"Three Porches to Country Houses," by Mr. Edward B. Wetenhall, might be supposed, in conjunction with the last, to be the victim of a subtle humour. Virile, youthful, "new-art" treatments of the every-day problem of a recessed doorway rather than a projecting porch, aiming to give interest to the middle-class house that is hardly more than a superior villa, this little drawing of elevations and plans, coloured and on tinted paper, is a complete antithesis to the last-mentioned drawing, below which it is hung on the skirting.

No. 1,407.—"Design for a Doctor's House, Westcliff-on-Sea," by Mr. Walter J. Tapper, is a square eighteenth-century flat-windowed house, with segmental over door; that is, the counterpart of the house in an old country town that one instinctively feels at first sight must be the residence of an eminently respectable doctor or lawyer. Westcliff-on-Sea is too young to have any real eighteenth-century house of this type, and the designer has shown shrewd business ability in providing his doctor client with this valuable credential.

No. 1,412.—"Ridgemount, Enfield, Middlesex," by Mr. Alfred H. Hart, we have previously instanced for its eccentric colouring. In design it bears the stamp of the young designer who knows too much, but has not yet learnt the value of restraint.

No. 1,414.—"New House, Leamington," by Mr. Herbert O. Cresswell, is a big hard drawing of a commonplace design, and therefore hung on the line, whilst below it on the skirting is

No. 1,415.—An etching by Mr. Fred. Slocombe of "South Drawing-room Mantelpiece in a House near Piccadilly," by Mr. C. J. Harold Cooper, showing a marble mantel with sculptured mermaids and a wood mantelpiece above; a delicate representation of a delicate design.

No. 1,416.—"House at Wolvesnewton, Monmouthshire," by Mr. A. J. Hardwick, as shown in a crisp, though slightly forced, pen and ink perspective by Mr. Sydney Castle, is a cleverly-designed stone house, with a half-timbered projecting bay that, in its introduction of modern details on an old type, unmistakably marks the twentieth century.

No. 1,417.—"New Residence, Yorkshire," by Mr. Temple Moore, is a quiet, unaffected large house of stone-country type, replete with the wise restraint that marks an intelligent appreciation of the secrets of our national seventeenth century designs.

No. 1,425.—"Billiard Room, Manhattan, Lancashire," by Mr. Huon A. Matear, is a large coloured drawing of an interior, on which ample funds have been expended in painted picture frieze, stained glass, elliptical ceiling with modelled plaster figures, costly woodwork, to evidence the wealth of the owner. It is, in fact, a room for an ostentatious man to show his visitors rather than for quiet after dinner enjoyment of home.

No. 1,429.—"Entrance Front, Castle Dyke," by Mr. J. B. Mitchell Withers, like No. 1,414, which it approximately balances in the hanging, is a hard, big drawing of a design that at first looks commonplace, but on closer inspection amuses. The end bay of the entrance front is a blank wall with a central chimney stack in the centre, and to make the design of this bay symmetrical, the gable round the corner at one end is echoed by a party wall through the roof. Or does the designer wish to suggest that the old and modest house to which additions have been made as the owner's wealth increased, until the mansion culminated in the biggest gable and three stories at the other end? There is an old house in a village well known to artists in which this has been the history that has produced a group not unlike that shown in this drawing.

No. 1,432.—"Design for Dining-Room," for Mr. Arthur N. Wesson. A coloured interior of unpleasant tone, in which is much carved and modelled detail that emulates the elaboration but misses the grace of rococo work.

No. 1,433.—"Proposed Country House," by Mr. George O. Scorer, is an example of the sincere flattery that is being largely bestowed by some of our youngest architects on a well-known leader of the "new art," who has established a definite individual type of house with an originality that entitles it to respect and freedom from plagiarism.

No. 1,435.—"Schoolroom, Conamur, Sandgate," by Mr. Alfred W. Jarvis, is another instance of admiration of another leading light in the "new art" movement, and is a quaint interior, with settles each side of a glazed brick fireplace and copper hood.

No. 1,438.—"Marlborough Chambers, Jermyn-street," by Mr. Reginald Morphew, is a block of shops and flats on a corner site, with a tower at the angle, clever, but somewhat forced in its grappling with a rather difficult problem in modern architectural design.

ARCHITECTURE AT THE ROYAL SCOTTISH ACADEMY.

As a whole, the exhibition this year is rather ordinary. There is no work of noticeable importance, whether as regards size, or cost, or interest. The contributions are almost wholly confined to Scotland, and it must be said that the best support given to the exhibition comes from local members of the Academy. There are drawings of work completed and work projected, as well as the usual company of the rejected in competition. The first class is illustrated by drawings solely; no photographs are permitted, as at Glasgow, and consequently some of these drawings do not quite accurately record the actual building, for, prepared beforehand, subsequent modifications in the erecting are unnoticed; it is comparatively rarely that drawings are prepared of buildings once completed, and hence photographs are the most literal illustrations. In the second class a solitary model is offered as the alternative to the cunning perspective: the example is of a bank for the Trongate of Glasgow, by Mr. Thomas P. Marwick. The style is a Georgian rendering of Classic, with rustication to pillars and windows: at the corners are circular towers corbelled out, with curved roofs. The model is to a generous scale, coloured, and set at a proper level, so that a very faithful idea of the ultimate effect is given. But whether after all the result is worth the effort is a point upon which some may differ. Elaborate or unusual compositions with a crescent frontage, or dome, or curves generally seem necessary to justify the model, and then for the designer's guidance perhaps even more than for public enlightenment. But besides model or perspective, the too much neglected geometrical elevation as a method of illustration is very well represented in Messrs. Peddie and Browne's three frames, the railway station at Stirling, and insurance offices in Leeds and Dublin; pen drawings in thick lines that tell very well, and it is only a pity that the shadows were not cast to show the sinkings and projections from the wall face, and so in effect give plan and vertical section at the same time. The studies in Renaissance are varied. The Leeds façade is the richest, with rather elaborate work round the windows of stone or terra-cotta, and the wall of brickwork. Besides Mr. Browne, Mr. Hippolyte J. Blanc is the only other academician who exhibits, and he has three works, in progress and completed—the New Gymnasium and Baths, Dunfermline, a Warehouse in the City, and the new pulpit of his great Baptist Church in Paisley. The purpose of the baths is fairly evidently expressed in the elevations, a high central block with gable and flanking circular turrets is contrasted with low side buildings. An alternative arrangement may be studied in the rejected design of Mr. Ure and Mr. E. M. Watson, where the centre feature is low and flat domed. The pulpit of Coats Memorial Church is shown in a very well executed large-scale drawing, tinted; it replaces a temporary one and has more of the railed platform shape than the wineglass, and is of stone, built against the chancel pier. The style is that of the whole fabric, geometric Gothic, and above the pulpit is suspended an elaborately-carved sounding-board. Of work by Associates of the Academy the most important is Mr. A. Marshall Mackenzie's tower of new Greyfriars Church, Aberdeen, much in the style of his college tower; Perpendicular, of great tenuity in the lights and mullions; granite is the material. Mr. Kinross is represented by a tea-room over a dairy at Buxley, for Sir T Miller, apparently intended as a lodge or summer retreat. The interior shows a square apartment treated in late Gothic, with stone fireplace, doorpiece, and mullioned window, the walls wood-lined with linen-fold panels and moulded stiles, the ceiling of timber and plaster, and all very richly treated. Mr. David A. Robertson has a design for Burnisland U.F. Church, a very poor thing indeed. Mr. John Jas. Burnet has also but one exhibit, his rejected design for National Bank, Glasgow.

The ecclesiastical work is of even less importance than the civil and domestic examples shown, and all, rather curiously, are in some variety of Gothic. Beechgrove U.F. Church, Aberdeen, Messrs. Brown & Watt, has a tall, well-proportioned spire, granite not permitting of much intricacy of detail; the church itself is of a quite ordinary type, but treated in a restrained and dignified way. Projected churches at Forres, by Mr. P. Macgregor Chalmers, and at Broomhill, Glasgow, by Messrs. Stewart & Paterson, show respectively earliest Gothic and Perpendicular of latest modern variety. An interesting restoration is suggested of Dunkeld Cathedral choir, now in use as parish church, in so far as the removal of the modern internal gable, box-pews, and two galleries are concerned, but with apparently no other structural interference. The architect is Mr. A. H. Paterson, M.A. Stone vaulting is indeed shown, but this may not be seriously intended. Vaulting may once have existed, or at least been intended, but to attempt it now on the old walls would surely be risky. This apart, the reparation seems entirely judicious; evidently to permit of the south-east door being retained, although a modern insertion, the chancel space is rather pinched. A side pulpit, stalls, and screen are shown, and a feature is made of the Duke of Atholl's pew—he claims ownership of the cathedral fabric—treated as a balcony projecting from the north wall, and entered from the sacristy tower. The large colour drawing is by Mr. Paterson. Dunkeld House, situated but a few yards south of the cathedral, either rebuilt or altered by Mr. J. M. Henry, has little to commend it but its unpretentiousness, and this in its position is a merit; still, it might be that and yet have character, and this it lacks.

Central District School, Perth, by Mr. Geo. P. K. Young, is a three-story building in brick and stone, simply treated on Classic lines, with level cornice, and the most is made of a central lantern ventilator. The Nautical College, Leith, by Mr. Wm. C. Laidlaw, also Classic, is shown in some fullness, with plan and scale drawing as well as view. There are on view four of the designs submitted for the Hawick competition. Messrs. Scott & Campbell's, selected by the committee in contradiction of the assessor's placing, has its entrance at the corner, with a vestibule placed on the diagonal. The elevations are good. Gables have circled tipped pediments. By the same architects are some prettily-treated cottages at West Linton.

Of domestic work the best, perhaps, is a house at Helsingfors, Mr. R. S. Lorimer, a town mansion of some importance, in brick, with stone dressings; local character is given the curved and high-pitched gables. Hillside, Corstorphine, by Mr. F. W. Deas, is an interesting study in distinctively stone treatment, illustrated in a nice pencil sketch. In Fairside, Colinton (Mr. C. H. Maidman), of brick, a square tower is rather out of keeping with the rest of the house: this architect has a cottage at Stow, with half timber employed. An unsuccessful design for the Queen Victoria Memorial, Liverpool, by the Messrs. Rhind, is illustrated in a well executed wash drawing. The composition is triangular on plan. Above curved trusses are a portrait statue of the Queen and groups of statuary; a central shaft, or pier, has a

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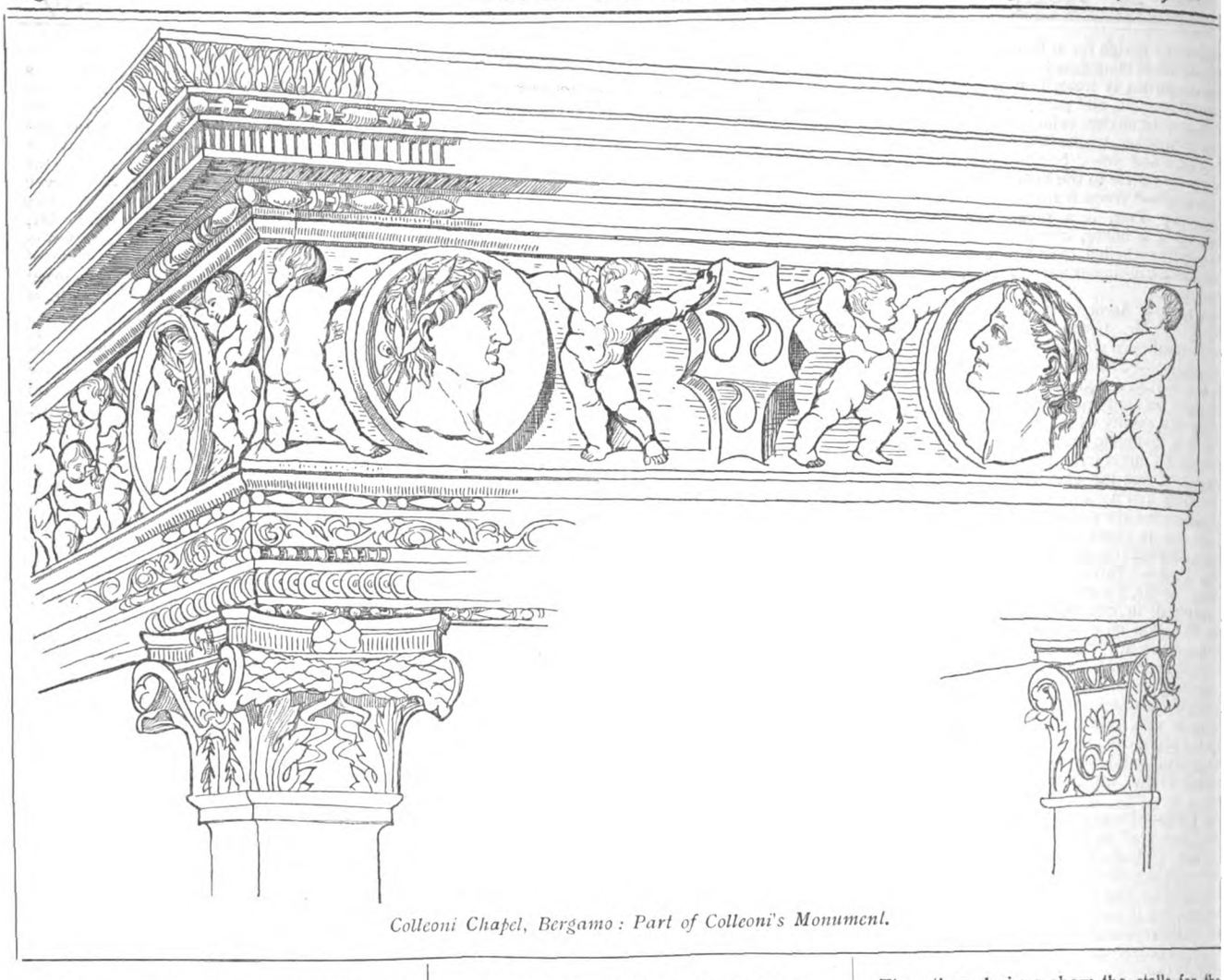

Colleoni Chapel, Bergamo: Part of Colleoni's Monument.

rounded top, making the general outline pyramidal; the whole is handled in a sculpturesque manner. Granite apparently was the material proposed.

There are one or two drawings of old work without any special merit. Mr. Wellesley Bailey's coloured sketches of the Leonardo Bruni monument, Florence, are interesting. A small but notable section is devoted to metal-work, enamels, and jewellery. Mr. H. Wilson exhibits a chalice and a cross in silver, with small enamels and gems inset. The very opposite to latest modern art of sinuous indeterminate line, they perhaps err in definiteness of detail; architectural features in miniature—such as turrets and gablets—are not unknown in old ecclesiastical vessels, but one is hardly prepared nowadays for their revival. An altar cross in beaten brass and enamels—these last by Lady Gibson Carmichael—by Mrs. Traquair, is interesting; she herself has three small enamel plaques, and Miss Story one. Somehow these give the idea of the result being not much less the work of chance than of intention in the way colours run into one another and over the line. Mr. H. Wilson has a case of jewellery, silver principally, wrought and chased, employing the figure in some instances, with enamels and gems. In Mr. Nelson Dawson's case of jewellery the setting is rather more structural and substantial, and the work generally on a larger scale. Mr. Jas. Cromer Watt's case shows more made of the gems themselves; their irregularity in form is rather delighted in. The setting is of the slightest, and a partiality is shown for delicate chain work.

THE SAILORS' PALACE, EAST LONDON.—For the equatorial and other instruments which will form part of the equipment, the British and Foreign Sailors' Society have commissioned Sir Howard Grubb, of Dublin, to make a revolving dome and observatory that are to be erected at the King Edward VII. Nautical School of the Sailors' Palace.

PROPOSED RAILWAYS: LONDON TO THE SOUTH COAST.—It is announced that Mr. Behr, C.E., has been appointed engineer in respect of two projects for a "mono" railway line from London to Dover, and another from London to Brighton, and that he is about to make the surveys and prepare the plans for the two lines, in readiness for the Bills that will be submitted to Parliament.

COLLEONI CHAPEL, BERGAMO.

THE monument to Colleoni at Bergamo is a very remarkable example of sculptor's architecture of the Early Italian Renaissance; the entablature and capital illustrated are from the monument within the chapel executed in white marble, probably the work of Amadeo; the figures, which are the chief attraction of this delightful little work, were drawn by Miss E. M. Green. W. CURTIS GREEN.

PUBLIC OFFICES COMPETITION, MALDEN.

MR. SIDNEY R. J. SMITH, the assessor appointed by the Malden and Coombe Urban District Council, has not yet placed the premiated designs in the competition for public offices, fire brigade station, &c., about to be built at New Malden. Twenty-two sets of designs have been submitted and have been on view to the public during the week. The conditions seem to have been favourable to a successful competition, but the results are very poor indeed. There is only one clever design, that under the motto "Cluny," and this is submitted in a form only intelligible to architects who appreciate imaginative idea above highly-finished commonplace. The drawings are the roughest scrawls we have ever seen on public exhibition, and no assessor could be expected to champion them before a council of laymen who expect their requirements shown in readable form. We cannot, therefore, feel any sympathy for the author of this set who would undoubtedly have been successful had he taken more trouble.

Competitors are allowed the option of providing either a public hall to seat 420 persons, or a council chamber to seat about thirty, so designed as to be capable of extension as a public hall hereafter. This condition has been disregarded by "Economy and Utility," who shows a council chamber incapable of extension, and no suggestion for a public hall of any kind; in other respects, the design is perhaps the most suitable of those sent in, and it is distinguished by being the only one which has arranged the accommodation for horses and engines in the fire station in the proper manner.

The other designs show the stalls for the horses in a separate building in another part of the site. The design entitled "Ad Rem" shows a well-treated exterior, but the required accommodation has been insufficiently studied, resulting in a bad plan. "Bee" has probably the fewest faults of all, and these can be easily altered as far as they are superficial; for instance, the rate collector should have been on the ground floor, the clerk's offices should have been on the first floor next to the committee and council rooms, and there should have been a separate entrance and lobby for the surveyor who pays the men weekly. The elevations are extremely commonplace.

After "Bee," in our opinion, comes the design having a halfpenny stamp to distinguish it. This design shows the same mistake as "Bee" in putting the clerk's offices on the ground floor, *away* from the committee rooms. The hall and corridors are badly lighted, and would be worse in this respect when the proposed large hall was built later. The elevation to the street is superior to most of those sent in.

ARCHITECTURAL SOCIETIES.

BRISTOL SOCIETY OF ARCHITECTS.—The last ordinary meeting of this Society for the present session was held at the Fine Arts Academy, Queen's-road, Clifton, on the 12th inst., Mr. Joseph Wood, the new President, being in the chair, when Professor Beresford Pite delivered a lecture on "Street Architecture." Prior to the business of the meeting the President alluded with regret to the death of Major C. E. Davis, of Bath, who had done so much for the sister city in the development of its famous baths and the uncovering and preservation of the remains of the Thermæ of the Romans, and upon the motion of the President, seconded by Mr. G. H. Oatley, a vote of condolence with Mrs. Davis, the widow, was passed. The subject of the lecture was recently dealt with by Professor Pite in a paper read before the Society of Arts, portions of which were given in our issue for April 12. A vote of thanks to the lecturer was carried, upon the motion of Mr. F. Bligh Bond, seconded by Mr. M. A. Green, of Bath, and supported by Mr. John Fisher, head master of the Kensington School of Art.

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COVENT GARDEN OPERA HOUSE.

THE alterations and improvements which have been carried on at Covent Garden Opera House for the last three years, in the intervals between ball and opera seasons, are now completed.

The work on the new stage has comprised the entire reconstruction of the stage, including the raising of the roof, the complete equipment of the stage with new machinery, new flooring, &c. This was one of the most important of the operations, and involved a considerable extent of work. It comprises practically the entire gutting of the back of the house, which includes a very large stage, a back stage, and a paint room, flanked on either side by wing stores. The approximate height of this block is 90 ft., the width about 90 ft., and depth about 100 ft., the whole almost forming a cube of 90 ft. base. The extent to which the stage roof was raised was 20 ft., the actual roof being bodily raised, and then re-fitted with modern skylights. The roofing materials are of the old, heavy, slated pattern.

The level of the stage floor was somewhat altered and made dead level, instead of being on the rake. The floor was supported by steel construction, divided into a number of movable sections, and the various movable sections are worked by electric power. The upper part of the stage has been fitted with a modern grid-iron and an elaborate system of counter-weighted battens. The whole of the top work is constructed on what is known as the "Brandt" system, the lower part of the work on what is known as the "Sachs" system. A very large number of cloths can now be hung on close spacing. Sections of the floor can be raised and lowered at will. All unnecessary inflammable materials have been removed, and everywhere steel construction, wire rope, and metal fittings are used. The floor of the stage, fly galleries and mezzanine and the planking of the gridiron alone are of wood for acoustic reasons. The main floor on the stage is hard wood, *i.e.*, English oak.

The main contractors for this part of the work were Messrs. Colls & Sons, Drew-Bear, Perks, & Co., and the Thames Ironworks Co.

The management of the stage has been put in the hands of Mr. Neilson, who has considerable American experience, with Mr. Robert Afleck as principal mechanist and Mr. Crawshaw as electrician.

The entire re-modelling of the scene stores, the stage offices at the back of the house, the wardrobes, &c., has been completed, and lifts have been provided in the two stage staircases. The lifts which go up the centre well of each staircase are of the usual hydraulic type, by Messrs. Waygood. Further, a system of steam effects for the stage has been installed, worked by the aid of a small steam boiler.

In connexion with the new scene store an electrical hoist has been fitted. This hoist has been placed at the back of the stage, and with its aid long scenery "cloths" are hoisted in bundles from the scenery cellars below up to or above stage level. The hoist itself is in the form of a triple windlass gear worked on to a shaft at the end of which is a motor. The maximum weight of the scenery is 15 cwts., and this can be raised or lowered at the rate of 50 ft. to 100 ft. per minute. The apparatus is placed some 30 ft. above stage level in a niche so that a view can be obtained.

A large asbestos curtain has been provided between the auditorium and stage, and was constructed by Messrs. Merryweather. The total area of the screen covered with asbestos is 3,286 square feet. The total weight of the ironwork is about 7 tons, and the counter-balance weighs about 2½ tons. The curtain can be worked either from the stage or from the stage-door keeper's room.

There is a new full equipment of stage electric lighting. The contractors for this were Messrs. Townsend & Co., and the work was executed under the directions of Mr. Wingfield Bowles. By the new electric lighting system the old gas appliances have been entirely superseded, and the danger from fire much reduced. One of the features of the system is the use of four distinct colours, namely: white, red, blue, and amber for stage effects. Another feature is that the whole of the switchboard arrangements are placed in a chamber underneath the stage with look-out appliances. Next, the whole of the stage has been wired on two distinct circuits, so that if at any one time one source of supply fails, there is always a second supply by which the lighting arrangements can be carried on. Among the fittings there are 61 ft. of electric battens, each containing 220 lamps of various colours. Another type of fitting is to be found in the vertical wing lights, each comprising seventy-five lamps. Further, a float has been sunk in front of the stage containing 250 lamps. The whole of the stage offices have been electrically lit.

The electric lighting in the front of the house has also been completed. The principal corridors, the saloon, and lounges are now electrically lighted, gas having almost been done away with. The gas chandelier has been replaced by a number of pendant electric lights, which are very effective; they are run in two circuits planned in the form of two rings. The switchboard for this part of the house is fitted independently of the stage switchboard, and has been placed below the vestibule on the Bow-street side with access by a stalls corridor.

The rearrangement of the stalls with new exits, and the provision of a special stall corridor was an improvement of considerable extent. This alteration gives the auditorium additional seating accommodation, *i.e.*, two new boxes and some forty additional stalls. The stalls are now provided with three exits. The exit to Floral-street for the pit and first tier box holders has been remodelled; new entrances have been cut into the Bow-street portico, and thereby the whole of the carriage arrangements have been greatly improved, while the time occupied in filling and emptying the theatre is materially reduced.

The saloon has been improved by the addition of some large pictures and general redecoration, and a conservatory lounge has been constructed over the main porch. It contains bars and affords accommodation for smoking.

The warming and ventilation scheme of the auditorium is on the Plenum system. By adopting the Plenum system and doing away with the large chandelier which acted as an outlet in former years the existence of draughts will no doubt be diminished. The fans for the ventilation scheme are electrical fans, for which special mains have been run.

The alterations to the orchestra involved picking up the front of the stage with some light girders supported by steel columns, a space having to be formed underneath in the front of the stage to take a number of players.

The improvements in the decorations include the Royal box, Royal approach, and Royal smoking room. The corridors have been re-decorated in green. New upholstery has been provided throughout including the tip-up seats, and the installation of a red silk drapery curtain by Messrs. Bertram in the proscenium opening has materially altered the appearance of the house.

The sanitary arrangements have been thoroughly overhauled, and the principal lavatories added to and ventilated. The lavatory appliances are by Messrs. Doulton. Several Blackman fans have been used to assist the ventilation.

The office accommodation at the corner of Bow-street has been remodelled, and now comprises an outer office, a secretary's room, a directors' room, and a telephone room, with approaches both from Bow-street and Floral-street. The management, further, have now at their command an elaborate system of public and private telephones, speaking-tubes, and bells. Every part of the house is now in close touch with the management. The box-office has been provided with private telephones from the libraries, and a private telephone to the nearest fire-station has also been installed.

The whole of the work has been under the direction of Mr. Sachs, except the electric lighting, which was carried out by Mr. E. Wingfield-Bowles. The principal contractors were:—Messrs. Colls & Sons; the Thames Ironworks, Ltd.; Messrs. Drew-Bear, Perks, & Co.; the Army and Navy Auxiliary Stores: Messrs. Bertram, Townsend, Tamplin, & Makovski, &c.

THE SANITARY INSTITUTE.—The Duke of Northumberland, Vice-President, will preside at the Sanitary Institute Coronation Dinner to be held on Monday, June 2, at the Midland Grand Hotel. Among those who will be present are Sir Joseph Fayrer; Sir Francis Sharp Powell; Sir Samuel E. Scott; Sir William H. Preece; Sir Henry Norbury, Director General, Royal Navy; Surgeon-General W. Taylor, Director General, Army Medical Service; Mr. E. Barnes, Mayor of St. Pancras; and Mr. R. M. Hensley, Chairman of the Metropolitan Asylums Board.

COMPETITIONS.

WOLVERHAMPTON HOSPITAL FOR WOMEN.—At a meeting of the committee of management of the Wolverhampton and District Hospital for Women held on Friday, the 16th inst., the plans of Mr. A. Eaton Painter, of 30, Lichfield street, were accepted for the proposed new hospital to be erected in Park-road West, and Mr. Painter was appointed architect to carry out the work. In the competition eight designs from architects who are members of the Wolverhampton and District Architectural Association were sent in, and the assessor, Mr. T. W. Aldwinckle, F.R.I.B.A., in making his award, stated that the whole of the designs sent in bore evidence of careful study and thought, and indicated a good acquaintance with the subject.

OPEN SPACES.

THE Metropolitan Public Gardens Association have agreed to offer to lay out the churchyards of St. George's, Bloomsbury, and St. John's, Stratford, to take steps to secure the preservation of St. Peter's-square, Hammersmith, and of some land that formerly belonged to Wandsworth Common and now occupied by the Patriotic Fund Commissioners, who, it is apprehended, will utilise it for building purposes, and to oppose schemes for building upon the churchyards of St. James's, Clerkenwell, and Holy Trinity, Stepney. The last-named burial ground, about one acre and a quarter in extent, was laid out by the Association in 1886; the Consistory Court granted a faculty in September, 1900, for an enlargement of the church, and in June, 1901, a supplemental faculty for the erection of a parochial hall, but the London County Council have applied to the Court for a revocation or modification of the latter faculty, as being contrary to the provisions of Section 3 of the Disused Burial Grounds Act, 1884.—The trustees of the Walcot Charity estate, Lambeth, have decided to open the enclosures of Walcot-square and St. Mary's-square, near Kennington-road, as playgrounds for children.—On the 10th instant Princess Christian opened the Victoria Recreation Ground, which extends over 17½ acres and lies on the main road to Barnet. The land has been secured as an open space with a recreation ground in commemoration of Queen Victoria's Second Jubilee, at a total expenditure of about 9,500*l.*, towards which amount the Middlesex County Council contributed 1,646*l.*, the Ecclesiastical Commissioners, who are lords of the manor, lent to the Urban District Council 5,000*l.* at 2 per cent. per annum to be repaid in the course of fifty years, and private individuals subscribed more than 3,000*l.*—On Whitsun Monday the Manor House Gardens at Lee were dedicated to the use and enjoyment of the people of London; the gardens appertained to the old manor-house, rebuilt in or about 1470; the manor now belongs to the Barings, having been purchased by Sir Francis Baring, Bart., from Lord Sondes in 1798, and belonged to the Crown during the reigns of Henry VIII. and his five successors on the Throne.—On the 10th inst. were opened at Ilford two parks—the one, 9 acres, given to the public by Mr. A. Cameron Corbett, M.P.; the other, 32 acres, acquired by the Urban Council from Mr. W. Mills, of Loxford Hall, at a price of 320*l.* per acre.—The Epping Forest Committee of the Corporation have under consideration a proposal that they should promote a scheme for purchasing, at a total outlay of 27,000*l.*, some lands from adjoining owners for an addition to the forest.—The County Council of Essex are in communication with the Ilford Council in respect of the preservation, at an estimated outlay of 20,000*l.*, of 800 acres of Hainault Forest, where, it is stated, numerous enclosures have been made of late to the prejudice of public rights.—Mr. Frank Lloyd has presented to Croydon 14 acres of land adjoining the Addington Hills (80 acres), near Shirley Common, which already belong to the borough, together with an adjoining area of 17 acres, which Mr. Lloyd lately bought for 5,000*l.*, and offers to the Croydon Corporation for 1,750*l.*—Mr. George Taylor will make a "Coronation" gift to Reigate of a park at Colley Hill, adjoining his own residence at Margery. The park extends over 25 acres on Colley Hill, which rises to an altitude of 740 ft., overlooking the town, from which an extensive and beautiful prospect is obtained. On one side the park is sheltered by Margery Woods; it is traversed by the ancient road—known as

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the Pilgrims' Way—in its course from Hampshire through Surrey, and so along the northern downs into Kent, and contains an old quarry whence a plentiful supply of Reigate stone was formerly procured.—A park has been secured at Darlaston, in the Victoria-road, by purchase in part by the District Council and by gift of the remainder by the Mills family.—At Towyn, Merionethshire, Mr. R. J. Roberts has conveyed, for a merely nominal consideration, to the townsfolk, the beautiful Dolgoch estate, nearly 250 acres in extent.—We gather that Mr. A. Marshall Mackenzie will prepare the plans for the laying out of the public park, 45 acres, at Grant Lodge, which, together with the lodge, Colonel Cooper recently gave to the citizens of Elgin. The lodge will be converted for purposes of a museum, a public library, and the librarian's residence.

Illustrations.

AN ARTISTIC POSTER.

A GREAT deal has been said of late years, and quite truly, as to the possibility of designing posters in an artistic spirit, and in France especially two or three artists of genius have devoted themselves mainly to this branch of art.

There could hardly be a better example of this artistic treatment of the poster than the one which has been got up at Turin in connexion with the Art Exhibition there, and of which we have thought it well worth while to give a reproduction. Both in the general lines of the design and the character of the writing it is quite a work of art.

NEW ROOMS, WELBECK ABBEY.

WE give illustrations of two rooms that form a part of the work now in progress at Welbeck Abbey, for the Duke of Portland.

It will be remembered that a fire destroyed part of this building, and the accompanying flooding with water made it necessary to "gut" the injured half of the house, known as the Oxford Wing. The external stone walls have been mostly preserved; but the rooms, corridor, and staircase, with their decorations, are new, and upon an altered plan.

For the Duchess's own rooms (boudoir, bedroom, and dressing-room), occupying one end of this wing, an Early Italian treatment has been adopted. The drawing shows the Duchess's boudoir, the chimney and doorways of which are of Istrian marble. The doors and woodwork generally are of Italian walnut, as also the coffered ceiling, with carvings and gesso work. The walls will be hung with silk.

The main portion of the house is at the same time undergoing great changes, with a redisposition of its rooms, improving and lighting the approaches to the same, also providing a new top story under a copper roof.

The new dining-room is shown in one of our plates. The oak-panelled walls are spaced with a view to receiving the fine Vandycks belonging to the Abbey. At one end of the room is a minstrels' gallery. The waggon ceiling has enriched ribs.

Messrs. Ernest George & Yeates are the architects, and Messrs Trollope & Sons the contractors, for this work.

The drawings are exhibited at the Royal Academy.

BATTERSEA WORKING CLASS HOUSES COMPETITION.

WE give this week No. 3 of the plans by Messrs. Smith & Weald which obtained the first premium in the recent competition organised by the Battersea authorities.

It shows a two-storied house with two self-contained tenements of four rooms each; each floor having living-room and bedroom in front, with two bedrooms, scullery, and water-closet at the rear. The cubic contents of the block are 22,040 ft., and the estimated cost 734*l*.

ALTERATIONS TO WORKHOUSE AND COTTAGE HOMES, LANCHESTER.—At the monthly meeting of the Lanchester Guardians on the 15th inst. the Board accepted the competitive plans of Messrs. Newcombe & Newcombe, of Newcastle, for the alterations to the workhouse and cottage homes, at a cost of 11,400*l*.

Books.

Lighting by Acetylene. A Treatise for the Practical Lighting Engineer. By FREDERICK DYE, M.R.I., Consulting Engineer. London: E. & F. N. Spon, Ltd. 1902.

THIS book is written for those erecting, or intending to erect, acetylene lighting works, and for those needing either general information or details of construction. It is divided into seven chapters, under the following heads:—(1) "Carbide of Calcium," (2) "Acetylene," (3) "Acetylene Generation," (4) "Generators: Types and Examples," (5) "Purification of Acetylene," (6) "Burners and Appliances," (7) "Legal and other Regulations."

The author considers that "the lighting engineer who takes up acetylene will now or very soon find a wide and profitable field for this branch of his business," and that a good acetylene generator "will yield gas which will compare favourably in cost with coal-gas for a given light at 3s. 6d. per 1,000 ft." But, unlike many acetylene engineers, Mr. Dye is sufficiently ingenuous to point out in a subsequent chapter that this comparison is made upon the assumption that the coal-gas is burned in flat-flame burners, and not in incandescent burners, which latter increase the lighting value of coal-gas to fully six times the figure adopted for comparison.

There is little doubt that Mr. Dye's policy of publishing the plain facts about acetylene will be more effective in advancing the acetylene industry than will the policy of less scrupulous advocates. We quite agree with the author that "the price of the gas is a subject that has had some doubtful treatment at the hands of generator makers, who, for obvious reasons, have grasped at and advertised theoretical figures, which the most perfect means of generation could never confirm in practice"; also that it is "important that the common idea of acetylene giving a light of 50 candles per foot should be swept away," since 34 candles per foot is the highest efficiency which can be fairly claimed.

The chapter on purification is, for the most part, excellent, but on p. 147 reference is erroneously made to bleaching powder as "calcic chloride." The active constituent of bleaching powder is calcium hypochlorite, a compound which readily parts with its chlorine, whereas calcium chloride is a more stable compound, commonly used by chemists for desiccating purposes. It is true that bleaching powder is sometimes improperly called "chloride of lime" in commerce, but never calcic chloride.

The book is copiously illustrated, and even those quite ignorant of the characteristics of acetylene and calcium carbide should be able to understand its entire contents without difficulty. It should prove of material service to builders, contractors, and others seeking practical information relating either to acetylene installations or portable acetylene lamps.

The Health Officer's Pocket-Book. A Guide to Sanitary Practice and Law. By EDWARD F. WILLOUGHBY, M.D., D.P.H., &c. Second Edition, revised and enlarged. London: Crosby Lockwood & Son. 1902. Pp. xxii., 424.

DR. WILLOUGHBY has endeavoured to provide for Medical Officers of Health and Sanitary Inspectors a handy work of reference in which they may find in a moment most of the facts, formulæ, and data required in their daily practice. He claims to have taken the "pocket-books" published for the use of engineers and surveyors as his models, but he has certainly not attained the terseness and condensation which characterise these works. Some of the chapters are succinct treatises rather than mere collections of facts and figures. The result is that the work is more interesting than the title would lead the reader to expect. Part I. deals with "Practical Hygiene," and contains chapters on Mathematical Practice, Meteorological Practice, Demography and Statistics, Engineering Memoranda, Sanitary Practice, Potable Waters, Dietetics, and Scavenging. Part II. is entitled "Sanitary Law" and occupies, with the appendices, nearly half the volume. The first part is naturally the more interesting to our readers. Dr. Willoughby writes with knowledge and acuteness on the subjects which fall within the Health Officer's province, and provides food for thought as well as facts and figures for reference. Chaps. iv. and v. on "Engineering Memoranda" and "Sanitary Practice" might with advantage have been cut down. The Health Officer does not want formulæ on the velocity of the flow in channels and pipes, or the cost of bored and driven-tube wells, and the engineer will certainly go elsewhere for the information; there are more modern formulæ than those mentioned by Dr. Willoughby, and other forms of egg-shaped sewers than that illustrated. On p. 95 we are told that a 4-in. drain is large enough for most houses, but one of the "Rules respecting Drainage" (p. 387) states that "main drains shall not be less than 6 in. in diameter." We might quote other examples to show that the author is not quite in his element when dealing with the practical work of the architect and engineer, but will merely mention the jejune remarks on surveying, the condemnation of iron drain-pipes, and the recommendation that a drain under a building "should be laid in a bed of fairly fine concrete *or asphalt 18 in. to 24 in. square in cross section.*" These, however, are only small blemishes, and Dr. Willoughby may be congratulated on having produced an interesting and valuable work. A word of praise is also due to the publishers. The book is clearly printed, well bound in limp purple leather and finished with gilt edges and rounded corners.

A Handbook of Hygiene. By A. M. DAVIES, M.R.C.S., D.P.H.; Lt.-Col. R.A.M.C.; late Sanitary Officer and Bacteriologist, Army Headquarters, India; &c. Second Edition, illustrated. London: Charles Griffin & Co., Ltd. 1901. Pp. xii., 624.

THIS book rather resembles Dr. Willoughby's, being in the main an extended treatise on the subjects discussed in Part I. of the "Health Officer's Pocket-Book." In both books there is evidence of a lack of intimate knowledge of building and engineering details. Lieut.-Colonel Davies does not appear to be quite clear as to the difference between interception and disconnexion in drainage systems, nor is he clear as to other details of house sanitation or the design of hot-water heating apparatus, &c. His book is, however, a mine of valuable information for doctors, bacteriologists, and other specialists, and laymen will find in it much of interest with regard to clothing, food, exercise, bathing, and the causation and prevention of disease. The sections on air and water are admirable, the evidence adduced in regard to the causation of disease by impurities in these "elements" of the ancients being particularly instructive. One small error may, however, be mentioned; the cubic space required in board schools is not 100 cubic ft. per child as stated on p. 52, but varies in mixed schools from 120 in small classrooms to 140 in large rooms, and from 108 to 126 in infant schools. Perhaps the author has made an allowance for the space occupied by the teacher, the children, and the furniture, but if so, the fact ought to have been stated. The book is carefully printed in small but clear type, well bound, and provided with a good index. We have pleasure in giving it a hearty recommendation.

Surveying, and Surveying Instruments. By G. A. T. MIDDLETON, A.R.I.B.A. Second Edition, revised and enlarged. London: Whittaker & Co. 1902.

IT is not necessary to refer in detail to the main features of this handy little work, which expresses very clearly and very well some of the most salient points connected with the art of surveying. In an elementary treatise of the kind, it is, of course, impossible for the author to do more than to scratch the surface of the ground traversed, but the important thing is that the lines inscribed should be in the correct direction. In the present issue the most noteworthy additions relate to the use of the plane table, to the computation of areas, and to the setting out of land and curves. By the aid of the plane table the operator is enabled to obtain details in the field without chaining and plotting or taking angular measurements, and it is therefore an instrument whose use should be understood by surveyors desiring approximately accurate results, such as are required in exploring expeditions, or in filling in the topographical details of more scientific surveys.

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The chapters now included add considerably to the usefulness of the work.

The Modern Treatment of Sewage. By H. C. H. SHENTON, M.S.E., Gold Medallist, Society of Engineers. London: S. Edgecumbe-Rogers.

A MUCH more imposing volume might have been made of the 117 pages of text comprised within the limp covers of this book, but as the price would probably have been doubled, the student has no cause for grumbling. The work is a reprint of articles contributed to the *Local Government Journal*, and is divided into fourteen chapters dealing with the design and construction of sewers, sewer-flushing and ventilation, sewage-disposal, &c. The title is somewhat misleading, as the subject of sewage treatment occupies less than one-third of the book, but Mr. Shenton has much useful information to impart in the earlier chapters, and they may be regarded as a long but valuable introduction to the final chapters. We have pleasure in commending the work to students; they will find it a convenient summary of modern theory and practice, although the description of percolating filters is inadequate, and seems to show some lack of knowledge of the most modern types. We may point out that "oval" is not synonymous with "oblong," as Mr. Shenton seems to think (pp. 43 and 44), and that "plenty long enough" is an expression of which Dean Alford would not have approved. It is a pity that the book is issued without an index.

The Business Encyclopædia and Legal Adviser. By W. S. M. KNIGHT, Barrister-at-Law. Six volumes: Vol. I., Aba to Con. London: The Caxton Publishing Co. 1902.

THIS is a new, ingenious, and rather ambitious book. The author describes it as being an "encyclopædia of practical affairs;" but "practical affairs" is so vague and popular a term that anything may be comprised under it, and a very cursory glance at this volume will show that this is the case. We find, of course, "Auctioneers" and "Architects" as headings, but we also find "Begging Letters" and "Baby Farming." It contains, nevertheless, a great deal of useful information combined with a good deal of commonsense advice. The character of the work can best be exemplified by the following quotation:—

"Architects are those whose profession it is to design and superintend the construction of buildings generally. The architect must be acquainted with the historical and artistic principles of building; with the cost of buildings and the means of keeping such cost within limits; with the strength, durability, and suitability of materials, and the methods of their application; and also with a considerable part of the law of and incidental to building operations. The profession is open to all without examination, the result being that many a so-called architect is to the public a snare and a delusion."

CONGRESS OF FRENCH ARCHITECTS.

THE thirtieth Congress of French architects will commence on Monday, June 2, by the reading of various communications, and a visit to the Palace Hotel, the Sevres manufactory, and a new chapel at Issy.

On Tuesday, the 3rd, the members will visit the Hotel of the Crédit Lyonnais, which has just been enlarged, and will hear a paper by M. Héron de Villefosse on a medal of Septimus Severus and on the restoration of the great altar at Pergamos. At the same sitting a paper will be read relating to the position of architects in respect to the law concerning accidents during building operations.

On Wednesday, the 4th, the sitting will open with some discussions on points raised at the last Salon, and by two papers, one on *Merulius Lacrymans*, the other, by Mr. Charles Lucas, on artistic property in works of architecture, and the history of the subject from 1793 to 1902. In the afternoon of the same day members will visit the memorial chapel in the Rue Jean Goujon, various houses in the quarter of the Champs Elysées, and the Hotel of *L'Illustration*.

On Thursday, the 5th, there will be an excursion to Sens and Villeneuve-sur-Yonne.

On Friday, the 6th, after the general annual meeting of the Caisse de Défense Mutuelle, the members of the Congress will visit the new Caserne des Célestins, the Buffet of the Gare de Lyon, the electrical works of the Metropolitan Railway, and the Caserne des Pompiers at Montmartre.

On Saturday, the 7th, M. C. Gautier will read a memoir of the late M. Coquart; M. Saladin will read a paper on a family of Tunisian architects of the seventeenth century; and the latter part of the day will be occupied by the usual distribution of "Récompenses," and the annual dinner at the Hôtel Continental.

BOOKS RECEIVED.

OPEN SPACES, FOOTPATHS, AND RIGHTS OF WAY. By Sir Robert Hunter, M.A. Second edition. (Eyre & Spottiswoode.)

THE LAW RELATING TO PERSONAL INJURIES. By F. G. Neave, Solicitor. (Effingham Wilson. 1s. 6d.)

TRANSACTIONS OF THE SOCIETY OF ENGINEERS FOR 1901. Edited by Perry F. Nursey. (E. & F. N. Spon.)

REFRIGERATION, COLD STORAGE, AND ICE-MAKING. By A. J. Wallis Taylor, C.E. (Crosby Lockwood & Son.)

THE CITY OF ST. ALBANS. By Charles H. Ashdown. (The Homeland Association.)

Correspondence.

RAIN-WATER TANKS—RULE FOR SIZE.

SIR,—In your issue of May 17, in the "Student's Column," I see a rule is given for finding the requisite capacity for rain-water storage tanks. Your contributor states that as a rough rule a storage capacity of two gallons for every square foot of horizontally measured surface of catchment area is "often said to be sufficient to store the heaviest rainfall and to provide a reserve in time of drought." Now as two gallons on a square foot of area would be a depth of nearly 4 in., and as 4 in. of rainfall in one day is an exceedingly rare occurrence in the average English district, that part in your contributors' statement may be considered trustworthy; but that a tank capacity of two gallons per square foot of catchment area will provide an adequate reserve in time of drought is very much dependent upon the relative proportion of the catchment area to the amount of water required. I take it that what the designer of rain-water storage tanks wants to know is, given the yearly amount of water required and the average yearly rainfall, how large must the tank be and how large the catchment area to ensure a full supply year in and year out over an indefinite number of years?

To simplify the necessary calculation we will as a first case assume that the catchment area is large enough to give, after allowing for absorption by and evaporation from the surfaces of such area, the full amount of water required during a year, should none be allowed to run to waste. The tank capacity must then be such that in wet periods it shall never overflow, since all rain that falls must during wet periods be stored for use during dry periods. The only method of arriving at the sum of excess supply over regular requirements is to take a series of actual records of rainfall, the longer the better, and by subtraction of the daily requirement from the daily fall, or fall plus the accumulated reserve in the tank, find out what is the maximum amount of water that will be held in excess as a reserve against subsequent drought. For example, as follows:—

The rainfall on Berkhampstead Common during the twelve years ending December 31, 1901, has been by observation 304·27 in. This gives a mean annual rainfall of 25·35 in. We have assumed that the catchment area has been planned of such a size that the average annual amount collected from it with the known mean annual rainfall equals the annual amount of water required. We will further assume that the loss by evaporation and absorption is 1·35 in. in the year. This leaves us a net yield from the catchment area of 24 in. per annum. The amount used is then also 24 in. on that area per annum. To subtract the daily requirement from the daily falls as recorded over those twelve years would take several days to work out, so that we will be content with subtracting the monthly requirement, 2 in., from the monthly falls as recorded during that period, month by month. Thus, at the end of every month we shall ascertain how much water there is in the tank, supposing that it be large enough never to overflow. It would take too much of your space to give the monthly figures, but the result of the calculation which I have made shows that the maximum accumulated surplus of supply over requirements was 16·12 in. (on the area in question, whatever that area may be), and reached that figure in March, 1897. In order, therefore, to prevent the water running to waste, and so causing a lack in succeeding droughts, the tank should have had a capacity of at least 16·12 in × area of catchment. This is equivalent to about two-thirds of the mean annual rainfall. If, therefore, the catchment area be 1 sq. ft. and the mean annual rainfall less evaporation be 24 in., and the requirements equal the mean annual supply, then the storage tank should hold two-thirds of 24 in. × 1 sq. ft. = two-thirds of 2 cubic feet = 1⅓ cubic feet = 8·3 gallons for every square foot of catchment area, or over four times as much as your contributor states in his rough rule.

In the second case the catchment area may be larger than is necessary to just give enough water with the mean annual rainfall, and then the storage tank would not need to be so large. For instance, if the catchment area were large enough to give all the water required with the minimum yearly fall, the tank in that case would only need to be large enough to contain the maximum accumulated *daily* surplus of fall over requirements during the one most droughty year. The driest of the above-mentioned series of years was 1898, when the rainfall on Berkhamsted Common was only 17·06 in. I have not worked out the accumulated surplus of daily fall over requirements for that year, but for the year ending September 30, 1901, that maximum amounted to 3·32 in. on April 13 and 14, 1901. Consequently I should say that given a catchment area large enough in the driest possible year, to supply all the water required, the size of the storage tank should be $\frac{3·32}{17·06}$ or, say, one-fifth of the minimum yearly fall—perhaps a quarter would be safer for the drier year. Conditions intermediate between those of the two cases here worked out would give results intermediate.

It must be remembered in making use of the above figures that little or no margin of safety has been allowed, and that it would be probably quite misleading to apply them to cases where the mean annual rainfall either greatly exceeded or fell short of that of the case under consideration, viz., 25·35 inches.

My excuse for this lengthy communication must be that having occupied the whole of the very rainy Whit-Monday on working out these figures, I thought the result might be placed at the service of your readers, and be of some value to them. Any corroborative evidence or criticism on my statements would be very welcome to me.

W. B. HOPKINS, A.R.I.B.A.

The Student's Column.

PART III.—PRIVATE SEWAGE DISPOSAL.

CHAPTER 19.—SEWAGE.

BEFORE discussing the various methods of sewage-disposal, it will be well to consider briefly what sewage is, and some of the most important changes which take place in it during the process of purification.

In the first place, it must be noted that sewage from buildings of the domestic class varies both in volume and in composition at different hours of the day.

The following analyses of the dry-weather flow from a small town are given by Dr. Rideal in his work on "Sewage and Sewage Purification," and show the variation in quality very clearly:—

Time.	Flow in gallons per 24 hours.	Parts per 100,000.						
		Solids in Solution.	Cl.	O consumed.	Free NH_3.	Albd. NH_3.	Nitric N.	Nitrous N.
10 a.m. to 5 p.m.	54,000	77·5	12·25	7·23	8·0	1·5	None	None
6 p.m. to 1 a.m.		45·0	6·25	6·91	2·90	0·6	,,	,,
2 a.m. to 9 a.m.		34·0	4·25	5·57	0·90	0·35	,,	,,

"In the morning urine is prominent, as shown by the chlorine and by other signs; later on, soapy water makes its appearance, with a white scum of fatty lime-salts that tends to clog filters and leave a greasy deposit on channels; fixed alkalinity also appears, with an increase in the sodium salts; subsequently the sulphuretted odour of vegetable washings

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is evident, and the liquid may even become temporarily acid."

This variation in the quality of sewage at different hours of the day furnishes a strong argument in favour of the storage of at least a day's flow, so that the tank-effluent will be fairly uniform in composition. Storage has also other important advantages which will be discussed at a later stage.

The flow of sewage varies also in quantity at different hours of the day. No hard-and-fast rule can be laid down as to this variation, as so much depends upon the nature of the buildings and the habits of the occupants. From midnight to about 6 a.m. there will, as a rule, be no flow at all in dry weather, if subsoil-water is excluded from the drains and if the water-fittings are perfect; nearly the whole of the daily flow will be discharged between 6 a.m. and 9 p.m., but during this time there will be great fluctuations. In the sewers of towns it has been found that one-half of the daily flow is discharged in about six hours, the maximum flow generally occurring between 10 a.m. and noon.

In considering chemical analysis of sewage and sewage-effluents, certain points ought to be borne in mind, in order to appreciate the facts which they are intended to disclose.

The solid matters in sewage vary according to the nature and quantity of the water supply and other circumstances. Part of the solid matter is mineral, and part organic, and of both kinds some is in solution and some in suspension. All water supplies contain mineral matter in solution, but the amount varies very widely, and the composition of sewage exhibits a corresponding variation. The mineral matter, whether in suspension or solution, is of little importance. The offensiveness of sewage is due to the presence of organic matter, which may be derived from fæces and urine, vegetable and animal food, waters of ablution, &c. It has been said that a typical average sewage contains in suspension about thirty grains of solid matter per gallon, of which twenty grains are organic and ten mineral, and in solution about seventy grains, of which twenty are organic and fifty mineral, but the ratios vary according to the freshness of the sewage, &c. In the purification of sewage nearly all the suspended matter is removed, and a very large proportion of the organic matter in solution is converted into harmless elements and compounds.

The amount of the chlorine furnishes a good index of the strength of sewage, and as it is not removed by the ordinary processes of purification, it affords the best means of comparing the character of the crude sewage and of the purified effluent which is said to have been obtained from it. In a pamphlet describing a patented process of purification, the following analyses appear :—

[GRAINS PER GALLON.*

	Free Amm.	Albd. Amm.	Chlorine.	Total Solids.
Crude Sewage.	5·0	0·75	8·4	58·0
Effluent	1·2	0·4	5·0	4·5

* To convert grains per gallon into parts per 100,000, multiply by 10 and divide by 7.

The amount of albuminoid ammonia in this effluent is far from satisfactory, but the figures speak still more strongly against the process when the chlorine is taken into consideration.

Let x=the volume of subsoil-water gaining access to the sewage during the process of purification and containing a parts of chlorine per 100,000; y=the volume of crude sewage containing b parts per 100,000; and $x+y$=the volume of effluent containing c parts per 100,000, then

$$(x \times a)+(y \times b)=(x+y) \times c, \text{ and}$$

$$x=\frac{b-c}{c-a}y.$$

Taking the figures in the foregoing analyses, and converting them into parts per 100,000, and assuming the subsoil water to contain 2 parts of chlorine per 100,000, we have :—

$$x=\frac{12{\cdot}0-7{\cdot}1}{7{\cdot}1-2{\cdot}0}y=\frac{4{\cdot}9}{5{\cdot}1}y=\cdot 96\,y.$$

On this assumption, therefore, the sewage had been diluted with an approximately-equal volume of subsoil water, or the analysis of the effluent represented a 50 per cent. weaker portion of the daily flow than that of the crude sewage. In either case, the amount of purification shown by the analysis requires correction, and the albumenoid ammonia in the effluent must be increased to about 0·4 grains per gallon or 0·5 parts per 100,000. The purification is utterly inadequate, a commonly-accepted allowance for sewage effluents being 0·1 part of alb. amm. per 100,000.

Chlorine is present in all drinking water, and in much rain-water, but the chlorine in domestic sewage arises chiefly from common salt in the kitchen wastes and in urine. It has been estimated that on the average human urine amounts to about 40 oz. per head daily, and that the chlorine in urine is about 500 parts per 100,000. The proportion in sewage of a domestic character varies very largely according to the degree of dilution, being in some cases more than 20 parts per 100,000, and in others less than 5; at Buxton, according to one analysis, it is only 2·3, and at Wolverhampton trade effluents raise it to more than 100.

The most important figures in a chemical analysis are those relating to the organic matter, and given either as "albuminoid" or "organic" ammonia, or as "oxygen absorbed" in a stated time. The Derbyshire County Council has adopted a standard of 0.1 part of alb. amm. per 100,000 for sewage effluents, and the Mersey and Irwell Joint Committee 0·14. The "oxygen absorbed" standard adopted by different authorities ranges from about 1 to 2 parts per 100,000 in four hours, but the methods of determination differ and the figures of different analysts are not always comparable.

Dr. Sidney Barwise, Medical Officer of Health for Derbyshire, recommends the following standard for sewage effluents :—

	Parts per 100,000.
Total suspended matter .....less than	3·0
Oxygen absorbed at 80 deg. F.	
in 4 hours ..... " "	1·5
Albuminoid ammonia ..... " "	0·15
Nitrogen as nitrates ..... at least	0·25

Definite standards based on chemical analyses are not, however, entirely satisfactory. Drs. Kenwood and Butler have shown that sewage-effluents are remarkably unstable—"what may be regarded as finished effluents may undergo daily changes so great that analyses, made even on consecutive days, give results so varying as to constitute the sample, as judged by present methods of analysis, a totally different liquid." In some effluents, the albuminoid ammonia increases, while in others it rapidly declines; others again, of an offensive character, may have, when fresh, a comparatively small amount of albuminoid ammonia and a trace of nitrates, but may become inodorous concurrently with an increase in the alb. amm. and the disappearance of the nitrates. "The fact is that albuminoid ammonia, like oxidisable organic matter, is only a partial estimate of the total organic matter present, and represents only the less stable portion . . . . What is needed undoubtedly is an inclusive estimation of the organic matter still in solution in an effluent, and until we get that it is impossible to lay down a hard-and-fast chemical standard applicable to all cases.*

The changes to be effected in sewage by the process of purification include the removal of nearly all the solids in suspension, the reduction of the putrescible organic matter to such an extent that the effluent is inodorous and non-putrefactive, and the beginning of the conversion of the organic nitrogen into harmless nitrates. Some of the solids in suspension are removable by simple sedimentation in tanks, or by a purely mechanical straining action on the surface of land or in filters. They may also be largely reduced by chemical precipitation. It is now well known that bacteria play an all-important part in breaking up organic matter in suspension, and in converting it by various stages into gases, nitrites, and nitrates, &c., and this knowledge has been put to practical use in most of the modern systems of sewage purification. These purifying bacteria are present in normal sewage itself, and carry out their important duties in sewage-tanks, contact-beds, and filters, and in the soil of sewage-farms.

What is required in an effluent is that it shall not be putrefactive, and the incubation test is often employed to determine this. Mr. Adeney has proposed an incubation test, which takes into consideration the water of the river into which the effluent is discharged: "The limit of impurity to be allowed in a water should be such that, when a given volume of it is mixed with a given volume of fully-aërated river-water, and the mixture kept out of contact with air, a decided oxidation of the ammonia originally present into nitrous or nitric acid shall be indicated."

Drs. Kenwood and Butler are of opinion that "one of the best tests for a satisfactory effluent is to see if nitrates are present after incubation at 80 deg. Fahr. for forty-eight hours, and if they are it will remain inoffensive no matter whether the original albuminoid ammonia was ·05 or ·5 part per 100,000." They add that all effluents should certainly conform to the following requirements :—"They should contain but very little suspended organic matter (certainly not more than five parts per 100,000); they should possess no odour of sulphuretted hydrogen; and there should be no physical evidence of putrefaction when they are incubated for a week in a closed vessel at 80 deg. Fahr."

In other words, a purely chemical analysis appears to be of comparatively little use. A satisfactory effluent is one in such a state of progressive purification that it will not putrefy or cause offence in any stream or body of water into which it may be discharged, but, on the contrary, will continue to improve. At the Manchester inquiry it was found that the effluents from the filter-beds had in many cases a decidedly beneficial effect on the water of the Ship Canal into which they were discharged.

* "Sewage Purification and Standards of Purity," by Drs. Kenwood and Butler, *Journal of the Sanitary Institute*, July, 1901.

GENERAL BUILDING NEWS.

BIBLE CHRISTIAN CHAPEL, PLYMOUTH.—Memorial stones in connexion with the new Bible Christian Chapel in course of erection in Embankment-road, Plymouth, were laid on the 7th inst. The architect is Mr. H. J. Snell, and the building will provide seating accommodation for 720 persons. The amount of the contract placed with Mr. J. H. Pavnter, Plymouth, was 4,270*l*.

CHURCH, KIMBERWORTH, ROTHERHAM.—On the 8th inst., the Archbishop of York consecrated the new Church of St. Paul, in Kimberworth-road. The site contains 1,320 square yards, and the church erected on it is only part of a building scheme, the plans for which have been prepared by Messrs. Stock, Page and Stock, of London. Accommodation is provided for 250 persons, but when the two additional bays have been added to the nave, and side aisles have been erected, the seating space will be largely augmented. This work, and the building of a tower, is left for a future time. The total cost of the church as it now is is stated to have been 2,800*l*. The contractors have been Messrs. Thornton & Son, of Rotherham.

HOLY CROSS NEW CHURCH, ARDOYNE, IRELAND.—This building was dedicated on Whit Sunday. The church consists of a nave and aisles, with large ritual chancel and side chapels, towers, baptistry, and Calvary chapel. In addition there is a Lady Chapel, divided from the south aisle by an arcade of coupled columns of Siberian marble. The principal entrance to the church is through the great west doors, which give access to the narthex under the organ gallery. The organ gallery is of timber, decorated and supported on polished marble columns, having marble bases and carved stone capitals. The carving of the external capitals has in several instances marked Celtic characteristics. The figure carving was the work of Mr. James Ovens, of Dublin and Preston, the carving of the nave and other capitals having been executed by Mr. Thompson and Mr. Copeland, both of Belfast. Of the exterior, the most imposing feature is the west front, with its heavily-moulded cornices and great west door, the tympanum of which is filled with a sculptured group by Mr. Ovens, and representing the "Taking Down from the Cross." Flanking the entrance on either side are the towers. The whole of the general contractors' work was carried out by Messrs. James Henry & Sons. The church has been built from the designs of the late Mr. Walter G. Doolin, M.A., and Mr. R. M. Butler, of Dublin, architects.

PRIMITIVE METHODIST CHURCH, BRADFORD.—The foundation-stones of the new Primitive Methodist chapel which is being erected at Daisy Hill, Bradford, were laid recently. The new chapel will be constructed of local stone. The length will be 75 ft., width 42 ft. (inside measurement), frontage 50 ft., and front elevation 50 ft. The front will face Smith-lane, looking towards Bradford, and at one corner there will be a small stone tower surmounted by a lead-covered spire. There are to be vestries for minister and choir, and a classroom or church parlour, and the building will also have a horseshoe gallery and an organ chamber, the latter situated behind the pulpit. The internal fittings will be of stained and varnished pitch pine, while the windows will be filled with leaded cathedral glass. Seating accommodation will be provided for about 500 persons. It is estimated that the building

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will cost about 2,000*l*. The architect is Mr. T. E. Davidson, of London and Newcastle, whose plans were chosen in competition.

ST. MARGARET'S CHURCH, POLMADIE, RENFREWSHIRE.—St. Margaret's Church, Polmadie-road, which has just been dedicated, consists of a large nave, with a side aisle divided from the nave by a high arcade of four stone arches. The chancel is 30 ft. deep, and contains the oak choir stalls, and at the back, on a platform elevated several steps, is the oak communion table. The chancel is lighted by a three-light window in the gable and two side-lights. There is a chapel on one side and an organ chamber on the other, and near the entrance porch is a wood-vaulted recess for the font, which is designed as a basin projecting from a niche in the wall, and supported on columns. The church is built of red freestone throughout. The roofs are of dressed timber, open to the ridges. The floors of the chancel, nave passage, &c., are laid with red tiles. The church is seated with chairs, and accommodates 800 persons. The hall is built of red pressed brick, with timber roof, and accommodates about 300 persons. The manse, which occupies the south-east corner of the site, is built with hollow walls and fireproof floors. The whole works have been carried out to the designs of Mr. P. Macgregor Chalmers, architect, with Mr. R. Kelly as clerk of works. The cost will be between 6,000*l*. and 7,000*l*.

METHODIST CHURCH, SUNDERLAND.—The foundation-stones of the new Thornhill Church, Sunderland, have just been laid. The buildings will occupy a site at the corner of the Burn Park-road and Beechwood-street. At the corner a tower, surmounted by a spire and vane, will rise 75 ft., and in this will be placed a dial-faced timepiece. There is a frontage of 130 ft. overlooking the Burn Park, and the whole of the main entrances will be in this elevation. Three portals give admission to the church, through an outer and inner porch, the staircase to the gallery being within the tower. The church itself will consist of nave, clearstory, aisles, transepts, and chancel, and an end gallery over the entrance porches. It will have a seating capacity for 520 adults, which can be augmented to about 620 as occasion requires. The nave arcades, and choir arch will be worked in Denwick freestone, and the pulpit will have a base of the same material, the upper part being carved in oak. The chancel is raised three steps above the nave level. The roof will be of pitch-pine, three-quarter open timbers, with chamfered and moulded hammer-beam couples. At the entrance to the church are separate cloakrooms for ladies and gentlemen. The school, which is recessed from the main road by two front classrooms, will have accommodation for 300, and will be divided into classes, with separate side classes for senior and infant scholars, while a movable rostrum will allow of its conversion into a public hall. The roof is similarly treated to that of the church. The corridor is placed at the side of the school, running its whole length, and is recessed for cloaks and hats. The buildings will also contain a church parlour and seven vestries, a kitchen-vestry being provided. The whole will be lighted by the electric light, and the windows will be glazed in cathedral-tinted glass. The buildings have been designed and the work will be carried out under the supervision of Messrs. W. & T. R. Milburn and J. Ezra Miller. The contractor is Mr. W. B. Cooper, of Sunderland, and the cost will be about 7,600*l*. The clerk of works is Mr. R. F. J. Carter, of Sunderland.

BAPTIST SCHOOLS, HISTON, CAMBRIDGE.—These schools were opened on the 10th inst. The schoolroom is divided up into a number of classrooms by means of swivel partitions, which, when thrown back, make one large hall. Two large seniors' classrooms are provided, together with infants'-room, kitchen, class-rooms for boys and girls, and the usual offices. The plan is of nave and aisle arrangement (the classrooms being in the aisles). Timber columns and arches carry the clearstory. The interior joinery is stained transparent green and varnished. The external facings are of red brick, with Bath-stone dressings. The roof is covered with green slates. The heating is by hot water on the low-pressure system. The contract was let to Mr. H. Feast, Maddenham, and amounted to 1,852*l*. The architects for the buildings, and for the church adjoining (recently completed) are Messrs George Baines and R. Palmer Baines, Clements Inn, Strand, W.C.

WORKMEN'S DWELLINGS AT HIGHER WINCOBANK, SHEFFIELD.—Some time ago the Sheffield City Council approved a proposal that the Health Committee should be asked to bring forward definite plans for a scheme of working-men's dwellings, to be erected on one or other of the sites acquired by them. In accordance with this resolution the City Surveyor (Mr. C. F. Wike) has prepared rough plans for a first batch of houses on the estate belonging to the Corporation at Higher Wincobank. These plans have been approved by the Housing Committee. The proposal is to lay out one street for the present, and the plans show 104 dwellings, made up as follows:—Eight blocks containing two self-contained cottages, and four flats in each block; seven blocks, containing four cottages in each block; and twenty-eight semi-detached cottages. Most of the cottages will be four-room tenements, but a few of them, forming the ends of the blocks, will be larger. The flats will each have two rooms, with conveniences, and the first-floor flats will be separately entered from the house on the ground floor. It is not proposed to make any of the buildings more than two stories high.

BUSINESS PREMISES, FRASERBURGH, N.B.—These premises are being erected in Cross-street and Mid-street, Fraserburgh, for Messrs. A. Macdonald & Sons. The buildings are Scotch Baronial in character, and are built of grey granite ashlar. There are three stories, the ground floor being occupied by shops. The architects were Messrs D. & J. R. M'Millan. The contractors:—Mason, Mr. James Rollo, Fraserburgh; carpenter, Messrs. Scott & Macdonald, Fraserburgh; slater, Mr. James Reid, Fraserburgh; plasterer, Mr. Alexander Wiseman, Fraserburgh; plumber, Messrs. Ferguson & Co., Fraserburgh; painter, Mr. James Stewart, Fraserburgh; and iron-work, Messrs. J. S. Batchen & Co., Fraserburgh.

VICTORIA HALL, WIGAN.—The memorial stone was laid recently in connexion with the Victoria Hall, Wallgate, Wigan, which is itself intended to be commemorative of her late Majesty. The building, which is of brick, is being erected on a plot of land opposite the Trencherfield Mill, near the Canal Bridge. The building will have two dining halls for men and women, which will be opened daily. The architects were Messrs. J. B. & W. Thornley, of Wigan.

MUSIC HALL, GREENOCK.—At Greenock Dean of Guild Court, on the 15th inst., Mr. J. F. Arthur applied for warrant to erect a music hall at the corner of West Blackhall-street and Ker-street, on the site of the circus buildings. The architects are Messrs. Boston, Menzies, & Morton. The whole structure is to be fireproof, and the proscenium is to be shut off from the auditorium by a fire-resisting screen. The proscenium will be 30 ft. deep, the stage 50 ft. wide and 40 ft. deep, and accommodation is to be provided for over 1,700 persons. The application was adjourned for a fortnight to enable of reports being prepared by Firemaster Taylor and Mr. Devine, sanitary inspector.

MUNICIPAL BUILDINGS, HEREFORD.—The foundation stone in connexion with the new municipal buildings, Hereford, was laid by Princess Henry of Battenberg recently. The principal entrance is in the centre of St. Owen-street front, through a vestibule into a large hall. There is a grand staircase immediately facing. The offices are grouped practically around the hall, with a porter's room, telephone service, and cloakrooms for officials and clerks conveniently situated. On a mezzanine floor at the height of the front landing or staircase, the surveyor's department is placed, and the inspectors and workmen, &c, can use the public gallery stairs at the rear. The first floor is devoted to the assembly hall, council chamber, &c. The top floor is devoted to the caretaker's house and kitchen for the assembly room, stores, &c. In the basement are the weights and measures department, laboratory, and stores for the different departments, likewise heating chamber and coal store. The building is Renaissance in style. The heating will be by hot water and radiators on the low pressure system. The ventilation will be effected by an electric motor in the flèche over the assembly room roof. Externally, the St. Owen-street front will be faced with terra-cotta from Messrs. Doulton's, filled with cement or coke-breeze concrete. The roof is to be covered with Westmoreland green slates, and all the external woodwork of the flèche is to be of the best quality English oak. Internally the walls generally will be plastered and finished in a washable distemper, terra-cotta, or other approved tint. The assembly-room and council-chamber will have panelled dados of wainscot oak. The grand staircase is to be of polished York stone, moulded with Doulton's Carrara marble balustrade. The coved ceiling over is to be in stained glass and leaded lights. All the doors, architraves, and joiners' fittings generally will be executed in wainscot polished, the floors of the hall and landing will be in polished marble mosaic; with centres and borders to special design. The entrance lobbies, &c., will have the city coat of arms worked in. Messrs. W. Bowers & Co. are the builders, and the architect is Mr. Cheers, of Twickenham.

HOMŒOPATHIC HOSPITAL, BIRMINGHAM.—This building was reopened on the 14th inst. The Birmingham and Midland Homœopathic Hospital was established in 1875 at Broad-street-corner, when a Gothic building was erected upon part of the ground from designs by Mr. Yeoville Thomason. Building operations for the completion of the original scheme began about a year ago, in accordance with designs supplied by Messrs. Crouch & Butler. To the left of the main entrance is the Board-room, with its Old English fireplace, and beyond, there is the office set apart for the use of the Lady Superintendent. By staircase or lift, one ascends to the several floors above. The first of these is devoted to administrative purposes. Overhead is the men's ward, containing eight beds; whilst on the same level, in the older portion of the building, are women's wards, where there is accommodation for twelve patients. At the rear, in an apartment which was at one time used as an electro-plate showroom, a dozen children have been provided for. Accommodation now exists for fifty patients instead of thirty. On the top floor, with the operating-room, there are three private wards.

PUBLIC HALLS, SPRINGBURN, GLASGOW.—Springburn Public Halls were formally opened on the 10th inst. They are in Keppochhill-road, near to its junction with Springburn-road, and are capable of seating 1,200 and 400 persons respectively. Mr. W. Whitie was the architect.

TRAINING COLLEGE, LIMERICK.—A training college for girls has been erected in Limerick. The contract was placed in the hands of Mr. M. Glynn, Dublin, and Mr. Byrne, Dublin, was selected as architect, with Mr. P. Molloy, Limerick, clerk of works.

BUSINESS PREMISES, NEWCASTLE-ON-TYNE.—The premises being erected in Dean-street, designated "The Cathedral Buildings," are now approaching completion. The block has been built to the order of the churchwardens and overseers of St. Nicholas, and the seven stories contain eighty rooms, divided into ten suites of offices and six shops, with cellarage beneath. There are two entrances, one from the churchyard and the other from Dean-street, and a mosaic-floored entrance hall divides the buildings. A passenger elevator will run from the lower hall to the highest story. Messrs. Oliver, Leeson, & Wood are the architects for the work, and Messrs. Stephen Easten & Co. the contractors, with Mr. Matthew Dodds acting as clerk of works.

PROPOSED OPERA HOUSE, BLACKPOOL.—It is proposed to reconstruct Her Majesty's Opera House in connexion with the Winter Gardens, and to enlarge the building to double the capacity. Messrs. Maugnall & Littlewood, of Manchester, architects, have prepared the plans and drawings for the work. The whole of the Winter Gardens Church-street frontage from the present Opera House entrance to Adelphi-street will be taken in hand, and a new façade will be erected. The building will consist of two stories. The present entrance to the Winter Gardens will be embodied in the scheme, and remain in its present position. The existing entrance to the Opera House will form the entrance to the pit, and west of these entrances will be three shops. At the Adelphi-street corner is to be a square tower 100 ft. high, surmounted by an ornamental minaret. The entrance to the dress circle and upper circle will be under the tower at the westerly corner of the block in Church-street. This entrance hall will be almost as large as the present entrance hall of the Opera House. Staircases lead up to a foyer, which will be 120 ft. in length by 40 ft. in width. From the foyer is an entrance to the dress circle, 20 ft. wide, and an entrance to the upper circle of similar proportions. Ample cloakrooms, ladies' retiring-rooms, &c., are provided for. The useless room at the back of the present theatre is to be thrown into the body of the theatre. Increased accommodation will be given for 1,500 persons. The bars at the rear of the pit, the dress circle and the upper circle are to be cleared out, along with several stairways that can be dispensed with, and then there will be practically a reconstruction of the auditorium. Extra seating will be provided in the stalls. The pit will be carried further back and extra seating obtained. The circles will be entirely taken down and reconstructed. The dress circle, which now consists of only three rows of seats, will be increased to twelve rows. The upper circle, instead of having eight rows, will have fifteen. There will also be accommodation for 300 or 400 more in the gallery. The work will cost from 20,000*l*. to 30,000*l*.

STAINED GLASS AND DECORATION.

WINDOW, STANHOPE CHURCH, DURHAM.—On the 18th inst., the Lord Bishop of Richmond, Dr. Pulleine, unveiled and dedicated a three-light stained-glass window in the north aisle of Stanhope Church. In this work, the artists, Messrs. Wailes & Strang, of Newcastle, have dealt with the subjects of "Faith, Hope, and Charity." Faith and Hope are represented respectively by a cross and anchor. The centre light represents a female figure, with an infant in her arms, and at her feet two poorly-clad children—illustrating the spirit of Charity.

CHRIST CHURCH, OLD KENT-ROAD.—On Whit-Sunday a three-light window was unveiled in the nave of this church. The subject depicted is the "Lord's Supper," under canopies of fifteenth-century style. In the tracery above is an angel representing Charity, with cherubs on each side. The work was designed and executed by Messrs. Taylor & Clifton, of London.

FOREIGN.

FRANCE.—The monument to Comte, on the Place de la Sorbonne, was unveiled last Sunday. It consists of a marble bust on a column, on the left of which is seated a young labourer who meditates, with a hammer at his feet. M. Injalbert is the sculptor.——The Conseil Supérieur des Beaux-Arts will shortly have to elect a successor to M. Coquart, the late Professor of Architecture at the École. The candidates for the post are MM. E. Bénard, Loviot, and P. André.——M. Bevière, architect, has obtained the first premium in the competition for the laying out of a public garden and the erection of a school and a Salle des Fêtes at Lilas. M. Durand obtained the second premium and M. Chesnay the third.——M. Eustache has presented to the Académie des Beaux-Arts his set of drawings

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of the Via Sacra and the adjoining buildings, now on view at the Salon.——A new Society of engravers and amateurs has been formed at Paris, with the object of promoting the practice of wood engraving. ——A new post office and telegraph building has been opened at Epône, of which M. Deschamps is the architect.——The death is announced, at the age of seventy-nine, of M. Camille Bernier, the lanpscape painter, who made his first appearance at the Salon in 1848, and has exhibited there regularly since. He was made an "officier" of the Legion of Honour in 1892. His special province lay in painting the landscape of Brittany; one of his best works of this class is in the Luxembourg Museum.——We have also to record the death at the same age (seventy-nine), of M. Jean Jules Salmson, the sculptor, a former pupil of Ramey and Toussaint. He received medals in the Salons of 1863 and 1865, as well as at the International Exhibitions of 1867 and 1889. Among his principal works are "The Judgment of Paris"; Phryne before the Areopagus; the statue of Henri IV. which decorates the Hôtel de Ville of Rochelle; four statues representing Folly, Comedy, Satire, and Music, for the Vaudeville Theatre; "La Gloire" for the new portion of the Louvre; and a statue of Handel for the Nouvel Opéra, which was illustrated in the *Builder* of September 17, 1887.

UNITED STATES.—The German Emperor has notified the President that it is his intention to present an equestrian statue of Frederick the Great to the people of the United States, as a memorial of the visit of Prince Henry of Prussia to that country. The statue is to be erected in Washington, probably in front of the War Department buildings.——A travelling studentship in architecture has been established in Harvard University, from donations provided by Mr. and Mrs. Nelson Robinson, of New York. Its value is 1,000 dols. per annum, and it is to be awarded annually to graduates of the School of Architecture who have completed their course with distinction, or who have completed with distinction a post-graduate course of not less than one year. The winner of the award is required to spend a year in the study of architecture in Europe. —— Professor Trowbridge, of the college of architecture in Cornell University, has resigned his post, and intends to enter upon active practice as an architect in New York. —— The plans for remodelling the White House, at Washington, by adding curved wings and other features, have been abandoned for the present, and some simple changes in the interior of the building only, are now contemplated. The President's business offices are to be removed to a new building to be erected south of the White House, near the State department buildings. The cost of these changes is estimated at 150,000 dols.

INDIA.—The Military Works Department is constructing an important transport road from Quetta to Chaman.——The work of erecting the new municipal offices, Calcutta, will probably be carried out by the Municipality on the piece-work system, which is largely adopted by the Public Works Department. The tenders sent in have thus apparently been ignored, and the incident has given rise to much discontent and adverse criticism amongst builders in that part of Bengal.——A scheme has been sanctioned for the erection of a large police-station in Municipal Office-street, Calcutta.——The Government has erected at Amritsar a memorial in the form of a kiosk to the memory of the men of the 36th Sikhs who fell in the recent operations in China.

MISCELLANEOUS.

SCULPTURE WORK, CARDIFF NEW TOWN HALL.—A special meeting of the Town Hall Committee of the Cardiff Corporation was held recently. The architects (Messrs. Lanchester, Stewart & Rickards) wrote upon the question of sculptural adornments on the new Town Hall. They sent plans showing in outline their proposals, and suggested that Mr. Goscombe John, A.R.A., should be retained in connexion with carrying out the details. Mr. Rickards (a member of the firm) attended and gave an explanation. The provision in the specification and contract was for 8,000*l.* in the Town Hall account, of which 6,500*l.* was for statuary, and in the Law Courts the total was 4,500*l.*, of which 3,300*l.* was for statuary. Of the total of 12,500*l.*, 1,300*l.* would be for bronze work, &c., including 800*l.* for the crown of the Town Hall dome. The committee agreed that the architects, with Mr. Goscombe John, should obtain competitive designs for the work on the Town Hall and the Law Courts.

HOUSING OF THE WORKING CLASSES.—The Joint Committee of the two Houses of Parliament on the Housing of the Working Classes heard further official evidence on the 14th inst. with reference to the working of the present standing orders of Parliament in relation to the rehousing of persons of the labouring class displaced by railway and other undertakings. Mr. W. P. Byrne, Principal Clerk of the Domestic Department of the Home Office, and Mr. H. T. Steward, Consulting Surveyor to the Home Office, were the witnesses. Mr. Byrne put in a statement showing the actual amount of rehousing accommodation to be provided under schemes approved since 1884, and promoted by railway and other companies. Roughly speaking, nearly 18,000 persons had been displaced in the Metropolis and nearly 15,000 rehoused. In cross-examination, he explained that these figures did not at all represent the magnitude of the subject, because the operations of railway companies which diminish the accommodation of the working classes were probably slight in comparison with natural industrial changes, such as the building of factories. Mr. Steward stated that when a scheme was put before the Secretary of State he sent a duly qualified assistant round to every house which it was proposed to pull down, ascertaining the number of inhabitants, their occupations, wages, rent, and so on; then he reported to the Home Office, and the Secretary of State decided whether the company should be required to rehouse or not. Asked by the Chairman whether, when a rehousing scheme was carried out, the same people were accommodated as had been displaced, the witness said he was informed that as a rule very few of the same people were rehoused. In answer to Mr. Jesse Collings, Mr. Byrne acknowledged the satisfactory character of the co-operation which the Home Office had received from the County Council and the local authorities in the administration of the Act.

LABOUR CONDITIONS IN NEW YORK.—Some interesting particulars under this head are given in an official report just published, from which it appears that on September 30 last the number of labour organisations in New York State was 1,881, with a membership of 276,141, showing an increase, as compared with 1900, of 246 organisations and 30,760 members, of whom 14,618 were women. The largest groups of organised working men are those in the building trade, who represent about 31 per cent. of the trade unionists. During the year the relative amount of unemployed amongst members of labour organisations was smaller than in any recent years except 1899. The average earnings of organised working men in 1898 were 4 per cent. greater than in 1897; in 1899 they gained another 11 per cent.; in 1900 they lost 4 per cent.; while in 1901 they gained 5 per cent. so that at the latter date they were 16 per cent. higher than in 1897. On the other hand, it is estimated that the wholesale prices of meat, dairy, and garden products have during that period increased 26 per cent., and of breadstuffs 41 per cent. Admitting that retail prices may not have increased in quite the same proportion, it is still safe to say that the cost of living has increased since 1807 at least as much as the earnings of labour. During the last three years the average daily earnings of bricklayers and masons have been—in 1899, 16s. 2d. sterling; in 1900, 16s. sterling; in 1901, 17s. 4d. sterling; of carpenters—in 1899, 12s. 4d. sterling; in 1900, 12s. sterling; in 1901, 12s. 4d. sterling; of painters—in 1899, 12s. 10d. sterling; in 1900, 12s. sterling; in 1901, 12s. 5d. sterling; of plumbers—in 1899, 13s. 11d. sterling; in 1900, 14s. 8d. sterling; in 1901, 13s. 11d. sterling. As the outcome of the annual meeting of the Industrial Department of the National Civic Federation, held in New York in December last, an endeavour has been made to provide a committee which shall be able to prevent strikes and locks-out, and to aid in renewing industrial relations when a rupture has occurred, and this not in relation to any particular trade, but as a means of maintaining harmony between capital and labour under all circumstances. The new feature in this committee is the importation of representatives of the general public equal in number to those of capital, on the one hand, and labour on the other. Much is expected from this innovation, as tending to lead to a better understanding by the general public of the true causes of any dispute that may arise and of the means suggested for its settlement, matters which are often obscure at the present time, and on which it is therefore difficult to bring any force of public opinion to bear. The committee is composed of twelve members representing employers of labour, twelve representing organised labour, and twelve representing the general public, all men of great influence. The Committee declares that it is prepared to do what may seem best to promote industrial peace, to be helpful in establishing rightful relations between employers and workers, by its good offices to endeavour to obviate and prevent strikes and lock-outs, and to aid in renewing industrial relations when a rupture has occurred; they advocate conferences and mutual agreements between employers and workers; and, while assuming no powers of arbitration unless such powers be conferred by both parties to a dispute, declare that when requested they will either as a whole or by a sub-committee act as a forum to adjust and decide upon questions at issue between workers and their employers, provided that in the opinion of the Committee the subject is one of sufficient importance.

PROGRESS OF BUILDING IN PROVIDENCE, RHODE ISLAND, U.S.A.—A report has been received at the Foreign Office from Mr. Stockwell, British Vice-Consul, in which it is stated that the building trades there have been very active throughout the past year. One thousand three hundred and two permits to build were issued, being 200 more than in the previous year. The total cost of new structures, houses, and mercantile buildings in 1901 was 4,730,720 dols., the total cost in the previous year having been 4,204,950 dols. The new structures numbered 703, of which 401 were dwelling-houses. "Money," observes the Vice-Consul, "has been so plentiful and cheap that the man of moderate means may own, nominally, his home and pay interest instead of rent. During a part of last year skilled labour of the right kind was not sufficient to meet the demand. The painters struck for a day of eight hours, but were not successful. The eight hours' time-card has not yet been adopted anywhere in the State. The labour day remains at nine hours, occasionally longer, but never shorter. The following wages are paid:—Carpenters and painters, from 2 dols. 50 c. to 3 dols. per day; masons and plumbers, 3 dols. to 3 dols. 50 c."

DAY CONSUMPTION OF GAS (A CORRECTION).—We ought to explain that the figures quoted last week in our "Note" on this subject represent the increases in the consumption of gas on March 5, 1902, as compared with the consumption on March 5, 1901, and not the average increase for a year, as stated. This correction does not influence the noteworthy fact to which we desired to draw attention, viz.—that the volume of gas used during the hours of daylight is increasing at a more rapid rate than the volume consumed during the hours of darkness.

ETCHING OF WESTMINSTER ABBEY.—From the *Art Journal* Office we have an original etching by Mr. Axel Haig of the interior of Westminster Abbey, looking east. This is on a small scale, but a refined and artistic piece of etching, and we prefer it to some of Mr. Haig's larger and more highly worked plates, because it has more of the true quality and tone of etching, which are apt to be lost when an etching is laboriously finished up like an engraving.

GLASS WALL-TILES.—The "Glasgraphische Werke" (Frankfort-on-Maine), send us some specimens of their decorative wall-tiles made of glass. These are about ⅛-in. thick, and are made with decorative designs in colour similar to what can be done on encaustic tiles; and apparently the colouring is incorporated with the glass and does not yield to abrasion. The glassy smoothness of surface is, no doubt, as the manufacturers say, conducive to easy cleansing, but on the other hand that very smoothness and glitter of surface is in our opinion less agreeable from a decorative point of view than the less glassy but equally washable surface of encaustic tiles. There would be an economy in the use of these glass tiles, both in original price and in freight (in consequence of their lightness); on the other hand we should think they might be rather in danger of breakage in transit. We are informed that they have been largely used in Germany, and that 4 000 square yards of them have lately been supplied to the Hansa Commercial buildings at Düsseldorf, and in Frankfort they are largely used in hotels and private houses. Mr. J. C. Duntze, of Frankfort, is patentee and manager of the works.

INSTITUTE OF CLAY-WORKERS.—The annual dinner of the Institute of Clay-workers was held on May 14 at the Holborn Restaurant, where some seventy clay-workers, representing the brick, tile, and pottery industry in all parts of the country were present. Mr. Clement B. Broad occupied the chair. After the loyal toasts had been given, "The Architectural Profession" was proposed by Mr. W. B. Hughes, and replied to by Mr. Silvanus Trevail. "The Institute of Clay-workers" was proposed by Mr. Broad, and replied to by Mr. E. P. Collier, J.P. (who is the President for this year), and Mr. H. Greville Montgomery, hon. sec. The toast of "The Visitors" was proposed by Mr. Webster, and replied to by Mr. Ellis Marsland, Master of the Bricklayers' and Tilers' Company.—A party of clay-workers, numbering some fifty members, have started on an annual excursion, Paris being fixed upon this year. On the 16th inst. the members were to pay a visit to the National Porcelain Manufactory of Sèvres, and during the visit they will be officially received by the Union Ceramique of France, and a banquet will be given in their honour.

PROPOSED EXCAVATIONS AT SHAFTESBURY ABBEY.—Lord Stalbridge presided on the 17th inst. at a meeting at Shaftesbury to consider excavations it is proposed to carry out at Shaftesbury Abbey. It was stated that in July, 1861, a partial excavation of the site was made by Mr. Batten, agent to the Marquis of Winchester. When the foundations of the choir and the apsidal chapels on either side, as well as those of the crypt, were brought to light, many objects of interest were found, including a gold hoop ring set with emeralds, a chalice, and a number of heraldic floor tiles and portions of sculptured monuments. A small portion of the Abbey, barely a quarter, was disclosed, and it is now proposed to carry out a thorough excavation of the whole site. The Corporation of Shaftesbury have contributed 50*l.* towards the cost of the work. The work will be carried out under the supervision of Mr. Doran Webb, F.S.A. and President of the Wilts Archæological Society.—*Times.*

LEGAL.

FULHAM BOROUGH COUNCIL *v.* LONDON SCHOOL BOARD.

AT West London Police-court a few days ago, before Mr. Rose, there was an adjourned summons against the London School Board for not complying with the regulation of the Fulham Borough Council by not removing the old drains in constructing a new system at the Everington-street School. Mr.

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Courthope-Munroe supported the summons on behalf of the Borough Council, and Mr. George Elliott was for the School Board. It was stated that 1,400 children attended the school, and it was necessary on sanitary grounds to remove the old drains and substitute dry earth and ballast to prevent contamination. Members of the London Sanitary Protection Association gave evidence stating that it would be a waste of money to spend 300*l.* in removing the old drains, which had been properly disconnected with the new system All had been removed from inside the building, and those remaining were under the playground. It was argued that the regulation was invalid, as it was framed by the late Fulham Vestry. Mr. Rose expressed an opinion that the regulation was valid, and imposed a penalty of 40s., with 10 gs. costs. He said he would grant a special case if one was required. Subsequently formal notices were served for a special case.

DISTRICT SURVEYORS AND CORONATION PROCESSION STANDS.

THE case of The Mayor, &c., of Westminster *v* Watson and others, came before a Divisional Court of King's Bench, composed of the Lord Chief Justice, Mr. Justice Darling, and Mr. Justice Channell, on the 15th inst., it being a special case stated under Section 29 of the London Government Act, 1899, raising the question as to the powers, rights, and duties of district surveyors acting under the London Building Act, in respect of the inspection and supervision of wooden structures erected for the purpose of allowing persons to witness the Coronation procession.

It was decided in litigation between the Westminster City Council *v.* the London County Council (*vide* the *Builder* of December 21, 1901), that these structures were within the meaning of Section 84 of the London Building Act, and that by reason of the provisions of the London Government Act, 1899, the power to give licences in respect of them was transferred from the County Council to the Borough Councils. Before the passing of this Act the County Council made it a condition of the licence that the structures should be erected to the satisfaction of the district surveyors, and the practice of the Westminster City Council was to make it a condition of the licence that the structure should be erected to the satisfaction of their city engineer. The following questions arose between the Council and the surveyors:—(1) Whether the powers, duties, and liabilities of the surveyors with respect to the supervision or inspection of wooden structures falling within Section 84 of the London Building Act, 1894, had been transferred to the City Council and its officers; (2) whether wooden structures within that section were works of which the district surveyor should have notice under Section 145, and as to which he had duties of inspection and supervision independently of the terms of any licence; (3) whether the right to receive the fees for such supervision and inspection had been transferred to the City Council and its officers, or had lapsed, or was still retained by the district surveyors independently of the terms of the licence granted. On behalf of the Westminster City Council it was argued that the licence might contain such conditions as the Council might think expedient, and that Section 84 of the London Building Act stood by itself, and these structures were not within the rest of the Act. The district surveyors, the respondents, however, urged that they did not derive their authority from the County Council, though they were appointed by the Council, and that their powers and duties did not depend on the licence granted under Section 84 of the Act, but arose under other sections. They contended that the Westminster Council were not bound to insert any condition, and in the event of their not doing so, then if the argument on behalf of the Westminster City Council was right these structures would be put up without any supervision at all.

At the conclusion of the arguments of counsel, the Lord Chief Justice in giving judgment said that there were in the London Building Act provisions as to the duties of the district surveyors, who, though not exactly servants of the County Council, were under its jurisdiction. It could not be contended that it was intended to transfer to the officers of the new Councils the duties of the district surveyors; but the transfer of the powers of the County Council might, by its operation, destroy some of those duties. What the Court, therefore had to consider was the true view of the law having regard to the position of the County Council and of the district surveyors and what was intended to be transferred. The City Council could specify the conditions of the licence and could add any safeguard that they thought fit. If any duties were imposed on anybody by the licence, they were not imposed on the district surveyors. The transfer to the Borough Councils did not destroy any of the rights or duties of the district surveyors except in so far as the transfer involved their alteration or destruction. His Lordship answered the three questions raised by the special case as follows:—1. In so far as the duties depended on the terms of the licence, it was not a question of transfer. It was a question of duties imposed on the officers of the City Council by the terms of the licence. Therefore the district surveyors did not have the right or power of performing the duties imposed by the licence unless the licence expressly imposed duties on them. The answer to the question was that they were not transferred, and the district surveyors had no powers, duties, or liabilities under the licences which were granted by the City Council. 2. He thought that the district surveyors were entitled to have notice under Section 145 of the London Building Act, 1894, but not of all the things specified in that section, because they were not all applicable. He did not suggest that the district surveyors could exercise functions which had no relation to the character of the structure being erected. 3. The right to receive the fees clearly had not been transferred to the City Council and its officers, but he did not think that the right had altogether lapsed. It would be reasonable and proper for the County Council to exercise their powers of allowing a less fee, because the duties would be less. If in a proper case a district surveyor had a duty to inspect in order to see whether any provision of the Act had been infringed, he would be entitled to his fees, but he did not suggest that the district surveyors would be entitled to claim fees in respect of every one of these structures because they had certain duties under the Act.

Mr. Justice Darling and Mr. Justice Channell concurred.

Mr. Manisty, K.C., and Mr. Craies appeared for the Westminster City Council; and Mr. Macmorran, K.C., Mr. Walter Ryde, and Mr. E. Hilliard for the district surveyors.

A BRIGHTON BUILDING DISPUTE:

APPLICATION TO THE COURT OF APPEAL.

THE case of W. Belcher *v.* the Roedean School Site and Buildings, Ltd., and in *re* an Arbitration between the same parties came before the Court of Appeal composed of Lords Justices Vaughan Williams, Romer, and Mathew on the 15th inst.

Mr. George Bonner said that both of these cases were before Mr. Justice Bucknill in chambers the previous Monday, and in which notices of appeal had been given for the 16th inst. His application now was that the appeals might stand over until after the Whitsuntide vacation, as both sides were anxious to brief leaders and it would be impossible to do so in the time then at the disposal of the parties.

Lord Justice Vaughan Williams asked the learned counsel the nature of the applications in chambers.

Mr. Bouner replied that in the first case it was an appeal to the Judge against the decision of the Master refusing leave to enforce an award of the arbitrator. The other case had relation to the dismissal of an appeal by the defendants against a decision of the Master refusing to order the proceedings to be stayed. The action had relation to a building contract. (The case had been before this Court on a previous occasion on the appeal of the defendant company and Mr. J. W. Simpson, an architect, from orders of Mr. Justice Lawrence in chambers, dated August 8, 1901. *Vide* the *Builder* of November 9, 1901.)

Lord Justice Vaughan Williams said he knew that just before the Whitsuntide vacation it was very difficult to get leaders, but he thought that there had been ample time to have done so had the parties chosen.

Mr. Bouner replied that one side wanted to brief Mr. Reginald Bray, K.C., and the other Mr. Ralph Neville, K.C. When he told their Lordships that the case had taken two hours before the Master in chambers they would understand that the matter was not an easy one, and it was thought to be of such importance that a shorthand note was taken of the proceedings in chambers.

Lord Justice Vaughan Williams said he granted the application, though very reluctantly. He might say that he should not be a member of this Court during next term, but he hoped that the case would not take the time which the parties apparently anticipated it would take.

BUILDERS AND SUB-CONTRACTORS:

IMPORTANT JUDGMENT OF THE HOUSE OF LORDS ON THE WORKMEN'S COMPENSATION ACT, 1897.

IN the House of Lords, composed of the Lord Chancellor and Lords Shand, Davey, Brampton, and Robertson, on the 10th inst., a considered judgment was given in the case of Cooper & Crane *v.* Wright, raising an important point under the Workmen's Compensation Act, 1897. The case came before the House on the appeal of Messrs. Cooper & Crane, builders, from a decision of the Court of Appeal composed of the late Master of the Rolls (then Lord Justice A. L. Smith) Collins and Romer, reversing a decision of the learned County Court Judge of Nottingham (*vide* the *Builder* of March 10, 1900). The short facts were these:—The appellants had contracted to erect a building, and contracted with the respondent Wright to do all the slating work. A labourer named Brady, employed by Wright, was killed by an accident, and compensation under the Act was awarded to his widow against Cooper & Crane, who claimed to be indemnified by Wright. The County Court Judge allowed this claim and gave judgement for Cooper & Crane against Wright, but his decision was reversed by the Court of Appeal, the Judges there unanimously holding that Cooper & Crane were not entitled to indemnity from Wright. Hence the present appeal of Cooper & Crane.

Lord Robertson agreed with the following judgment of Lord Brampton, that the decision of the Court of Appeal should be affirmed and the present appeal dismissed.

Lord Brampton, in the course of an elaborate judgment, after stating the facts, said that no appeal was made by Cooper and Crane against the award for compensation. Against the order for indemnity Wright appealed, and the Court of Appeal set it aside upon the ground that a mere sub-contractor was not an "undertaker" within the meaning of the Act. His lordship considered that that decision was right. The first section of the Act was as follows:—"If in any employment to which this Act applies personal injury by accident arising out of and in the course of the employment is caused to a workman, his employer shall, subject as hereinafter mentioned, be liable to pay compensation in accordance with the first schedule to this Act." The 7th Section (1) enacts "This Act shall apply only to employment by the undertaker as hereinafter defined, on, in, or about a railway, factory, mine, quarry, or engineering work, and to employment by the undertakers as hereinafter defined on, in, or about any building which exceeds 30 ft. in height, and is either being constructed or repaired by means of a scaffolding or being demolished." Section 7 (2) defines the meaning of the term "undertakers" in the cases of a railway, factory, quarry, laundry, or mine, to be those who represent the persons or bodies actually carrying on business or work so described. "In the case of a building the word 'undertakers' is declared to mean 'the persons undertaking the construction, repair, or demolition.'" The first section imposing upon "his employer" the liability to pay compensation to a workman must be read by the light of Section 7 (1), which enacts, "this Act shall apply only to employment by the undertakers" as defined. It followed that the general words "his employer" in Section 1 must be read as "his employer, being also the undertaker." In this case the deceased man having been employed by Wright, the sub-contractor, and not by Cooper & Crane, the undertakers, his employment, although on the work undertaken by Cooper & Crane, was not, in his lordship's opinion, an employment to which alone the Act applied. It was obvious that the legislature did not intend that such a workman, who had been exposed to equal risks and dangers with his fellow-workmen should be excluded from the benefit of the Act; this was apparent from Section 4, which in substance provided that the undertakers of works of construction of or on buildings should be responsible for compensation to injured workmen employed by their sub-contractors as if they had been employed by the undertakers themselves. It would be convenient to set out Section 4 in full:—"Where in an employment to which this Act applies the undertakers, as hereinafter defined, contract with any person for the execution by or under such contractor of any work, and the undertakers would, if such work were executed by workmen immediately employed by them, be liable to pay compensation under this Act to those workmen in respect of any accident arising out of and in the course of their employment, the undertakers shall be liable to pay to any workman employed in the execution of the work any compensation which is payable to the workman (whether under this Act or in respect of personal negligence or wilful act independently of this Act) by such contractor, or would be so payable if such contractor were an employer to whom this Act applies. Provided that the undertaker shall be entitled to be indemnified by any other person who would have been liable independently of this section. This section shall not apply to any contract with any person for the execution by or under such contract of any work which is merely auxiliary or incidental to and is no part of or process in the trade or business carried on by such undertakers respectively." That the widow was entitled to compensation from Cooper & Crane, as the undertakers, seemed to his lordship to admit of no possible doubt. The judge was right therefore in his award of compensation against them. That award was not questioned. The real question before their lordships arose out of the claim of Cooper & Crane for indemnity from their sub-contractor Wright. The case in support of that claim was thus put. That by his sub-contract with Cooper & Crane, Wright became an "undertaker" equally with themselves within the meaning of the 7th Section, and was in every respect under the same primary obligation to pay compensation to the widow; and that such liability was a liability imposed by Sections 1 and 7 independently of the 4th Section, so as to bring him within the proviso in that section, and to give them a right to claim indemnity from him. He did not think that these propositions could be maintained. First, Wright was not an undertaker within the meaning of Section 7 of the Act. The Legislature, in using the expression "the undertakers" had given it a limited statutory meaning beyond which it could not be extended. To bring any person within the definition clause he must have undertaken some definite, specific work of construction which was to form the

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subject of his undertaking. In this case it was for the construction of an entire building. Secondly, the contract of the undertaker must be with a person who has authority to employ and to authorise the undertaker to accomplish the work undertaken. For such a work as the construction of an entire building, as was the case before their lordships, it seemed to him that two persons or sets of persons only could fill the position of "the undertakers" defined by the Act. The building owner who took upon himself the construction of the building he required, or the persons who, through the medium of a contract with him, engaged to take upon themselves the obligation to execute that work for him. He carefully abstained from expressing any opinion touching the responsibility of a building-owner who sub-divided the construction of a building among several contractors, because in this case, Cooper & Crane, by their contract with him, undertook the construction from the foundations to the top of the roof. By that contract they constituted themselves "the undertakers" of the whole building within the definition in Section 7. (2) From that contract they could not recede or be discharged unless with the assent of the building owner until the building was completely constructed; and to the execution of their undertaking they were bound to bring their personal skill and experience, and to exercise personal control over all the necessary operations. There was beyond this an obligation attached by the Statute to their undertaking, towards every workmen employed by them on that work undertaken, to pay to him, in the event of injury to him by accident, compensation, according to the Act. Neither the contractural obligations to the building owner nor the statutory obligation to the workman could be terminated or altered at the mere will or by any act of the undertakers. They could not assign their contract or any part of it, nor could they delegate their authority or any part of it to another. The building owner had no contractural relations with the sub-contractor, and could only look upon him as a mere employee of those with whom he has himself contracted. These considerations had satisfied him that the Act by no reasonable interpretation could be held to make a mere sub-contractor an undertaker within the meaning of the Act. He therefore thought that the appeal should fail.

Lord Davey was of a different opinion. Three conditions were necessary under Section 1 of the Act to give the workman a right to compensation:—(1) That the employment shall be one to which the Act applies; (2) that the injury has been caused by an accident arising in the course of the employment; (3) that the workman shall be in the employment of the person from whom he claims compensation. Section 7, sub-Section 1, defined the employments to which the Act applied, and a fourth condition was added to those which he had mentioned—viz., that the employer must be the "undertaker" as defined in Section 7 (2). In that sub-section he found that in the case of a building "undertakers" meant the persons undertaking the "construction, repair, or demolition." In other words, the undertakers are the persons who undertake. He took the liberty to say that this was not a definition, but a mere verbal or grammatical synonym, and it afforded but little assistance in construing the Act. It seemed to come to nothing more than this—that the word "undertakers" in the case of a building was used in its ordinary sense, whatever that might be. Nor could he find anything in the definition which required the undertaking or engagement to be directly with the building owner, or excluded a sub-contractor to whom the contractor for the whole building had let a certain portion of the work. Such a person undertook the work he was engaged to do as literally and truly as if his contract was directly with the building owner. Confining himself, therefore, to the definition, and independently of the fourth section, he was of opinion that in the case of a building a sub-contractor might be an undertaker within the meaning of the Act, and consequently a workman employed by him who had been injured by an accident in the course of his employment, would be entitled to claim compensation from him. It might be that the so-called definition was so general as to include two persons, each of whom from a different aspect might be the undertaker. Turning to Section 4, his Lordship said that he regarded that section as a proviso on Section 1; it provided that in a certain case the workman might have a right to compensation from one who was not his employer. It was thereby enacted (in substance) that where "the undertakers as hereinafter defined"—viz, persons who had undertaken in whole or in part the construction of any building—contract with another for the execution of any work, the undertakers should be liable to pay compensation to a workman employed by the contractor. The words describing the compensation which the undertakers were to pay to the workmen were these:—"Any compensation which is payable to the workman (whether under this Act or in respect of personal negligence or wilful act independently of this Act) by such contractor, or would be so payable if such contractor were an employer to whom this Act applies." Two cases were, therefore, contemplated:—(1) Where compensation was payable under the Act by the contractor, viz., the sub-contractor; and (2) where it would be payable if he were an employer to whom the Act applied. In other words, the language of the section expressly provided for a case in which both the so-called undertakers and the sub-contractor were severally liable under the Act to pay compensation to the workman for the same injury. The section appeared to give an additional remedy to the workman, and not to restrict his right under Section 1. It might be difficult in the case of a building to suggest cases in which a sub-contractor might or might not be an employer to whom the Act applied. It would seem that a sub-contractor who had undertaken part of the work must be one or the other in all cases alike. He now turned to the proviso on which the question before their Lordships turned: "Provided that the undertakers shall be entitled to be indemnified by any other person who would have been liable independently of this section." The meaning of that proviso was plain. Omit Section 4, and ask yourself was any other person liable. He had already expressed the opinion that, excluding Section 4 from consideration, a person who had contracted by way of sub-contract to execute work on a building would be liable, and he had pointed out that the language of the section itself contemplated that very case. He thought that the appeal should be allowed, with the usual consequences.

Lord Shand gave judgment to the same effect.

The Lord Chancellor also thought that the appeal should be allowed, and the judgment of the Court of Appeal reversed. If, as the Court of Appeal seemed to have held, an undertaker does include a person who sub-contracts for a substantial part of a building, then he did not understand why in this case Wright was not an undertaker by any of the ordinary particulars by which an undertaker could be described. Wright was certainly an undertaker. He undertook a substantial part of the work—namely, the roof—and he had the control and management of that part of the work. He employed Brady as a labourer in that form of employment, and he did not understand why it was suggested that he was not an undertaker, unless it was suggested that in order to be an undertaker he must take upon himself the entire contract that had been made by another person. It seemed to his Lordship that that would be an unreasonable construction of the Statute, which in its language was sufficiently clear. Whether the enactment was felicitously worded or not, when one looked at the section and the proviso together, he thought it could hardly be doubted that the meaning of it was that where part of the work was let out, although the builder of the entire structure should in the first instance be liable for injury to the workmen employed by the sub-contractor, nevertheless, he was not the actual employer, the builders who were thus made liable for injuries to a workman not employed by them should have a right of indemnity against the actual employer, between whom and themselves there was no relation except that of contractors. In these circumstances he thought that the judgment of the Court of Appeal was wrong, and he moved that it be reversed.

The appeal was accordingly allowed by a majority of three of the law peers against two.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

1,180.—A SCREW UNION FOR PIPES: *S. W. Wells.*—For the coupling together of four pairs of metal pipes whereof the given diameters are different, the inventor provides a screwed union which is screwed both without and within at each of its ends.

1,187.—BUTT AND FLANGE JOINTS: *A. Eadie and T. Tannahill.*—Two flanged rings are drawn together with bolts, and are so adapted that they can be screwed on to collars, a plain engaging-surface being thereby afforded in order that the tube or pipe shall fit spigot-wise into the faucet formed by the projecting flange of one of the rings.

1,190.—IMPROVEMENTS IN VICES: *O. Gopffarth.*—The vice consists of various parts that are forged and can be easily renewed. The flanged base of the fixed jaw fits into grooves cut in the side-plates, which are pierced for the fixing-bolts, and between them is a block that keeps them asunder; the parts thus named are secured together with rivets or bolts. The movable jaw carries a slide that slides upon the block between the side-plates, and a projection from the block holds the nut for the adjustment screw. Steel plates which are dovetailed on to the jaws, and are retained in their positions with screws, constitute the jaw-faces.

1,203.—DOMESTIC WATER-SUPPLY: *S. M. Rutnagur.*—For the delivery of regulated quantities of water and prevention of waste from, for instance, a continuous supply system or cistern, the inventor causes the water to flow in two streams through a closed container; one stream, having its own outlet, serves for a control stream, and as it collects in the vessel will gradually lift a float until a lug overbalances a weight upon the spindle of the supply-valve and thereupon shuts the valve, whilst at the same time it works a lever in communication with a discharge-valve. In another adaptation a pipe is inserted into the container, and has an outlet of small area so as to check the outflow of water. By way of an improvement of No. 13,796 of 1900, an adjustable stop which works through a fixed nut or carrier is substituted for the fixed stop which adjusts the position of the tippler; the stop is so set that the weight of the controlling water will not suffice to throw over the tippler or weight, or it can be set so that the position of the centre of gravity is on the other side of the centre, and will not allow the tippler to remain in the opened position after the operating handle has been liberated.

1,251.—MEANS OF SUPPORTING THE SIDES OF TRENCHES, CUTTINGS, &c.: *C. Walton.*—For affording a support for temporary purposes is devised an adjustable screw-jack that may be used together with a timber strut. The screw-jack is tube-shaped, and has a flanged nut which can be easily detached or repaired. The screw, which is capstan-headed, is secured to the one foot of the jack by means of a ball-and-socket joint, the other foot being arranged upon a pin or upon a universal joint.

1,258.—AN APPLIANCE FOR CHIMNEY-TOPS: *T. Cochrane.*—The cowl is fashioned as a bowl, and is secured to a spindle. A pivot-cone inside a tube at the middle point of a bridge, and an arch which is provided with an oil-well, carry the cowl above the mouthpiece of the chimney-top.

1,272-3.—MEANS FOR WARMING BUILDINGS: *T. N. Russell.*—For steam or vapour circulating systems it is contrived that one can, at the starting or at any time, remove air from the circulating-pipes and radiators without wasting the steam or vapour. Valves are so arranged that when the vapour or steam inlet is closed the air-line connexion shall be open, and the steam or vapour valve shall be opened when the air-line connexion is shut to the degree desired with a stem which serves as a piston-valve for the air-line. It is claimed that the system can be heated rapidly without waste of steam into the air-lines, and without escape of the confined air into the apartment, by a suitable arrangement of the valves in the main pipes and near the radiators.

1,273.—In the case of similar systems working above, below, or evenly with atmospherical pressure, and in which is maintained a partial vacuum in the air-line services from the mains and pipes or radiators, are devised valves for closing of the air outlet as far as may be necessary for obviating waste of the steam or vapour before one can open the steam inlet, by which means the system can be worked with temperatures and pressures of various degrees, and lower than that in the source of supply, the heating vapour not being wasted. The stem of the steam or vapour valve serves as a piston valve for the air-line. In another shape an equivalent valve, or two ordinary valves worked either together or separately, are substituted for the combination valve.

1,288.—WATER-WASTE PREVENTION APPLIANCES: *T. Beresford.*—A stem that is passed through a spring stuffing-box and is affixed to a cone-shaped striking-head carries a valve between the inlet and the outlet; between a piston and the end of the cylinder is placed a spring, the piston being fitted upon the inner end of the valve-stem; the piston also has an annular groove and holes which are to be closed with a disc-valve which a spring forces downwards. When the closet-seat is either raised or depressed a plate presses the conical striking-head inwards and the valve becomes opened, so that water will flow from behind the piston through the holes in the piston; thereupon the valve is shut slowly by the leakage of water around the piston into the space behind it again. For the striking-head here cited confer No. 12,307 of 1900.

1,300.—PIPE-COUPLINGS: *H. E. Mallby and H. Ratcliffe.*—Water, steam, compressed air, and gas pipes, mains, &c., under pressure, can be jointed or repaired by the provision of a stuffing-box which is made up in sectional parts to be put around the joint or the broken portion of the pipe. An annular division, having a tap, is made by bolting to one another the flanges of two of the sections. The two halves of each gland overlap at the joints, which are slotted to take the bolts that are hinged on to the two sections which, otherwise, are themselves hinged together, and are kept in their places with a wedge.

1,327.—A DRAIN-TESTING CONTRIVANCE: *A. T. Collins.*—To the end of a metallic pipe is secured the smell or smoke producing appliance round which is disposed a paper or similarly flexible tube. The flexible ending of the remoter pipe is joined to the metallic pipe with a ring. For forcing through the tester are used bellows after the "concertina" kind.

1,359.—CONSTRUCTION OF ROADS AND PAVEMENTS: *A. Selby.*—The object of the invention is to obviate damage that may arise from expansion or contraction, due to heat or other cause, which set up movement sideways in the paving. Insertion pieces, formed of compressible metal, or wood, plastic, or other substances, are fashioned as either tapered or channelled blocks. Some non-harden compressible material is filled into their cavi and they are covered during that process w thin strip of insertion. The blocks are var shaped; a curved block, or two inclined may be laid between two flat grooved bl compressible metallic insertion-piece will blocks having corresponding projections. compressible material can be forced into recesses in the blocks.

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1,363.—WATER-CURRENT MOTORS AND WHEELS: *F. T. Moate.*—The outer ends of vanes are hinged on to arms mounted upon a vertical spindle so as to be closed by the current or stream, whilst they are controlled with chains so that they cannot be opened to more than 90 deg. as they oppose the stream or current, the direction of rotation remaining constant through ebb and flow. The wheel is made of superimposed sections whereof the upper sections are thrown into and out of gear, with the rise and fall of the tide, by means of ratchet gear. Spaced strips, shaped as troughs, may be substituted for the flattened vanes.

1,382.—FASTENINGS AND JOINTS FOR PIPES, MAINS, COCKS, TANKS, &C.: *F. Albrecht.*—A coupling-piece which consists of two pin-jointed parts is screwed at its one end and has a collar and feet, turned in opposite directions, at the other end, between which it is held. On the collar are flats which correspond with flats upon the washer, which is held down with either a coupling-connexion or a locking nut. For tin drums or similar holders the coupling-pieces are grooved.

1,387.—A SUBSTITUTE FOR HARD RESIN: *A. Kronstein.*—For use in making varnishes, japans, insulating compositions, &c., a heated solution is made of Chinese wood oil and dammar, copal, amber, or asphaltum, to which a drying oil may be added. When the heating is stopped before the compound has become solid a soluble and highly consistent product is obtained, but when the temperature is increased to 300 deg. C. an oil will be obtained. Confer also No. 17,378 of 1900.

1,397-8. — SIPHONICAL DISCHARGE, TIPPING-TANKS, &C.: *W. H. Thompson.*—At one end of the float lever of the supply cock is attached a hollow receiver having a small opening at the base; at the other end is a weight connected to a valve which controls the inlet into a box into which the shorter leg of the siphon is introduced. An automatical and intermittent action is brought about through the inlet cock and the valve being shut during the process of filling until the water flows over into the receiver and by overbalancing it opens both valves and starts the siphon. 1,398.—The service-pipe constitutes a journal for the tipping-tank within its casing; the float of the supply cock is hinged on to the tank, and, under normal conditions, lies in the forked end of a pivoted and balanced lever which works the stem of the valve. When the tank is filled the balance weight of the lever keeps the valve shut; when the tank is emptied the inlet valve is kept opened by the weight of the float; thus, when the tank is tilted the supply cock remains shut as the float is lifted up with the tank.

1,479.—MANUFACTURE OF SLAKED LIME AND SANDSTONE: *D. Wachtel & Co.*—For making a completely slaked lime, and especially with a view to its being mixed with sand for an artificial sandstone the inventors mix, in a pug-mill, lime slaked into a paste with dry calcium hydrate so as to produce a plastic mass to be afterwards mixed with sand; the compound of dry and pasty lime is put into closed iron cases, which are then exposed in a chamber to the steam under high pressure, which completes the hydration by its heat alone, the hydrate being formed by the water held in the lime.

1,559.—SUPPLY AND DISCHARGE VALVES FOR DOMESTIC WATER SERVICE: *J. Denton.*—The flow of a starting-discharge into the longer leg of the siphon is regulated with a valve carried upon the lower end of a rod so as to press against a flange that is screwed into an extension on the side of a junction-piece which sustains the siphon and is bolted on to the cistern. Either a weight upon a rocking-lever, or a spring upon the rod, keeps the valve, normally, upon its seating. To the bottom of the cistern is bolted a similarly-constructed supply-valve, and a float, which is attached by a rod to its arm, shuts and closes the supply-valve, of which the tail-piece is provided with a guide on the cap.

1,588.—A SURFACE-WATER CONDUIT OR PIPE: *J. W. Thompson.*—A shallow channel, which is pierced and is grooved crosswise, that the water may flow into the drains, is fashioned along the top of each pipe-length. In another adaptation a separate block is let into the top of the drain, and is similarly perforated, and a receiver for grit, &c., is made underneath.

MEETINGS.

FRIDAY, MAY 23.

Surveyors' Institution.—Country meeting, Cambridge. Excursions.

SATURDAY, MAY 24.

Architectural Association.—First summer visit, to the new School Buildings, Christ's Hospital, Horsham.

St. Paul's Ecclesiological Society.—Visit to the Church of Denham. Train to Uxbridge from Paddington at 2.30 p.m.

MONDAY, MAY 26.

Royal Institute of British Architects.—Mr. T. H. Mawson on "The Plan of the House in Relation to the Garden." 8 p.m.

TUESDAY, MAY 27.

Society of Arts (Applied Art Section).—Miss May Morris on "Pageantry and the Masque," illustrated by lantern pictures. 8 p.m.

THURSDAY, MAY 29.

Society for the Encouragement of the Fine Arts.—Miss Ethel Halsey on "Rimini under the Malatestas," with lantern illustrations. 8 p.m.

Royal Institution.—Mr. M. H. Spielmann on "Contemporary British Sculpture." II. 3 p.m.

Institution of Electrical Engineers (Dublin Section).—(1) Mr. Marshall Osborne on "The Lighting and Driving of Textile Mills by Electricity." (2) Annual general meeting. 8 p.m.

SATURDAY, MAY 31.

Edinburgh Architectural Association. — Visit to Stirling.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 6.—By WM. ROLFE (at Masons' Hall Tavern).

City of London.—Aldersgate-st., The Clarence p.h., f., p., with goodwill £19,320

By RENDELL & SYMONS (at Totnes).

Rattery, Devon.—Torn Farm, 100 a. 2 r. 22 p., f. 3,150

May 7.—By Messrs. KEMSLEY (at Romford).

Upminster Common, Essex.—Tyes Farm, 10 a. 0 r. 4 p., f. 680
Podies Farm, 8 a. 3 r. 6 p., c. 500
Beacon Farm, 11 a. 3 r. 23 p., c. 500
Three cottages and 1 a. 0 r. 24 p., f., y.r. 22*l.* 6s. 450
A copyhold enclosure, 2 a. 2 r. 19 p. 200
Chadwell Heath, Essex.—Whalebone-lane, Fair View and West View, f., y.r. 48*l.* 670
1 and 2, Grosvenor-villas, f., y.r. 48*l.* 670
1 and 2, Belgrave-villas, f., e.r. 52*l.* 740

May 9.—By WYATT & SON (at Bognor).

Felpham, Sussex.—Rose Tree-cottages (two), f., w.r. 20*l.* 16s. 300
Alpha-cottages (four), f., w.r. 39*l.* 520
North Bersted, Sussex.—Chalcraft Field, 7 a. 0 r. 28 p., c. 240
South Bersted, Sussex.—Three freehold cottages, w.r. 22*l.* 2s. 420

May 12.—By CHANCELLOR & SONS.

Staines, Middx.—Richmond-rd., a freehold building site, with ornamental lake, area 1 a. 2 r. 19 p. 600

By MAPLE & Co.

Gravesend, Kent.—1 to 4, British Tar cottages, f., w.r. 41*l.* 12s. 210
Bentley-st., Library Cottage, f., w.r. 20*l.* 16s. .. 100
2½ and 3 to 8, Bentley-st., f., w.r. 93*l.* 12s. 510
41 to 45, 44A and 45A, Bentley-st., f., w.r. 84*l.* 10s. 450
37 to 40, Bentley-st., and 1 to 4, Library-pl., f., w.r. 81*l.* 18s. 320
1 to 4, Roberts-pl., f., w.r. 36*l.* 8s. 140
2 to 5, Milton-pl., f., y.r. 113*l.* 8s. 1,200
16, 22, 29, and 31, Milton-rd. (s), f., y.r. 140*l.* .. 2,200

By FRANK NEWMAN.

Peckham.—Vivian-rd., f.g. rents 54*l.* 10s., reversion in 62½ yrs. 1,423
Philip-rd., f.g. rents 18*l.*, reversion in 61½ yrs. 470
Manaton-rd., f.g. rents 47*l.* 10s., reversion in 63 yrs. 1,293
Claude-rd., f.g. rents 14*l.* 8s., reversion in 62 yrs. 390
Wivenhoe-rd., f.g. rents 71*l.* 6s., reversion in 62 yrs. 1,990

By PROTHEROE & MORRIS.

Stratford.—5 to 17 (odd), Cruikshank-rd., u.t. 70 yrs., g.r. 24*l.*, w.r. 184*l.* 12s. 1,000

By ALFRED SAVILL & SON.

Ilford, Essex.—Cranbrook-rd., The Highlands Building Estate, 17 a. 1 r. 30 p., f. 11,000
Chigwell, Essex.—Manor-rd., a block of freehold building land, 39 a. 0 r. 24 p.. 5,000

By GEORGE STOCKINGS.

Paddington.—12, Marylands-rd., u.t. 61 yrs., g.r. 10*l.*, y.r. 55*l.* 520
Dulwich.—321 and 323, Crystal Palace-rd., f., y.r. 54*l.* 860

By WOODS & SNELLING.

Hampton Wick, Middx.—Glamorgan-rd., Mervyn, u.t. 76½ yrs., g.r. 12*l.*, y.r. 45*l.* 465
Sidcup, Kent.—2, Norfolk-pl. (S.), u.t. 57 yrs., g.r. 5*l.*, y.r. 60*l.* 945
4, 5, 6, and 7, High-st. (S.), u.t. 56 yrs., g.r. 24*l.*, y.r. 243*l.* 3,820
Nelson-pl., a plot of building land, u.t. 56 yrs., g.r. nil 200
Clarence-rd., Bowden Villa, u.t., 74½ yrs., g.r. 4*l.*, w.r. 31*l.* 4s. 235

By CROPPER, STEWARD, & CATTELL (at Rugby).

Lilbourne, Northants.—Freehold farmhouse and 59 a. 2 r. 24 p. 2,850
Freehold house and meadow, 3 a. 3 r. 28 p. ....

May 13.—By DAVID BURNETT & CO.

Stamford Hill.—Amhurst Pk., Aberglaslyn, ut. 73 yrs., g.r. 25*l.*, p. 600
Fulham.—137, Fulham-rd., u.t. 14 yrs., g.r. nil, y.r. 110*l.* 575

By HAMPTON & SONS.

Chertsey, Surrey.—Bedford Lodge, f. p. 3,000

By HAMPTON & SONS.

Wakes Colne, Essex.—Wakes Colne Pl. and 3 acres, f., p. 700

By MAPLE & Co.

Regent's Park.—62a, York-ter. (S), u.t. 19 yrs., g.r. 15*l.*, e.r. 130*l.* 500
Hampstead-road.—31, Oakley-sq., u.t. 51 yrs., g.r. 23*l.*, e.r. 75*l.* 2,850

By ROGERS, CHAPMAN, & THOMAS.

Canning Town.—Bidder-st., &c., f.g.r. 30*l.*, reversion in 73 yrs. 630
Limehouse.—St. Anne's-row, f.g.r. 23*l.*, reversion in 73 yrs. 460
Twickenham.—Gravel-rd., freehold rent of 6*l.* 4s., reversion in 57 yrs. 125
Kensington.—Pitt-st., i.g.r. 16*l.*, u.t. 41 yrs., g.r. 5s. 280
Silvertown.—Cranbrook-rd., f.g.r.'s 21*l.*, reversion in 76½ yrs. 385
Barnwood-rd., f.g.r. 21*l.*, reversion in 76½ yrs... 410
Pimlico.—1, Bessborough-st., u.t. 28 yrs., g.r. 20*l.*, y.r. 50*l.* 700
24, Bessborough-pl. (stabling), u.t. 28 yrs., g.r. 10*l.*, y.r. 52*l.* 400
South Kensington.—16, Earl's Court-gdns., f., y.r. 70*l.* 1,250
20, Earl's Court-gdns., f., y.r. 55*l.*; also f.g.r. 5*l.*, reversion in 49 yrs. 1,200
Chelsea.—14, Hans-pl., beneficial lease for 8½ yrs., r. 80*l.* 1,080

By Messrs. RUTTER.

Warbleton, Sussex.—Craiglockhart Estate, 165 a. 0 r. 34 p., f. £3,050
Stoneland Farm, 36 a., f., y.r. 50*l.* 1,000

By DEBENHAM, TEWSON, & Co.

Ilford.—2 to 24 (even), Thorold-rd., f., y.r. 300*l.* .. 4,095

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; w.r. for weekly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 11 0	per 1,000	alongside, in river
Rough Stocks and Grizzles.....	1 9 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 5 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts ..	1 12 0	,,	,, ,,
Best Fareham Red	3 12 0	,,	,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,,	,, ,
Best Blue Pressed Staffordshire ..	4 6 6	,,	,,
Do., Bullnose	4 11 0	,,	,,
Best Stourbridge Fire Bricks	4 6 0	,,	,,

GLAZED BRICKS

Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers..	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers..	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.
Thames and Pit Sand	7	3	per yard, delivered.
Thames Ballast	6	0	,, ,,
Best Portland Cement	31	0	per ton, delivered
Best Ground Blue Lias Lime..	25	0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 10s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depot.
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 3	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks ..	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt.
,, ,, ,, 6 in. sawn both sides landings	2	7 per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1	2½ ,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	12 0 0	per 1000 of 1200 at rly. dep.
,, best seconds ,,	11 10 0	,, ,,
16×8 best ,,	6 17 6	,, ,,
20×10 best blue Portmadoc ..	11 7 6	,, ,,
16×8 best blue Portmadoc	6 5 0	,, ,,
20×10 best Eureka unfading green....	13 10 0	,, ,,
16×8 ,, ,,	7 10 0	,, ,,
20×10 permanent green	10 10 0	,, ,,
16×8 ,, ,,	6 0 0	,, ,,

[See also page 531.

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
*New Labourers' Dwellings	Liverpool Corporation	250*l.*, 150*l.*, 100*l.*	Sep. 15
*Municipal Buildings, Fire Station, Public Baths, &c.	Tottenham U.D.C.	200*l.*, 100*l.* and 50*l.*	Sep. 23
*Memorial to Queen Victoria at Allahabad	The Committee	2,000 Rupees	Nov. 1

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Twenty-seven Cottages	Carlow U.D.C.	J. Byrne, Civil Engineer, Town Hall, Carlow	May 26
*Lavatory Accommodation at Workhouse, Lr. Clapton	City of London Union	J. Johnson, Architect, 47, Mark-lane, E.C.	do.
*Border Seatings, &c.	Beckenham U.D.C.	The Council's Surveyor, Beckenham	do.
Hospital, Rhiwfelen, Fawr	Llantrisant R.D.C.	G. S. Morgan, Surveyor, School-street, Pontyclun	May 27
Six Houses, Gray-street	Bootle (Lancs) Corporation	Borough Engineer, Town Hall, Bootle	do.
Police Station and Court House, Dukinfield		H. Beswick, Architect, Newgate-street, Chester	do.
Workhouse, Oldmill, Aberdeen		Brown & Watt, Architects, 17, Union-terrace, Aberdeen	do.
Additions, &c, to Hydro, Darley Dale, Matlock		B. Stocks, Architect, St. Peter's-street, Huddersfield	do.
Schools, Cwmystwyth, Wales		J. A. Jones, Architect, 7, Queen's-terrace, Aberystwith	do.
Police Station, Dukinfield		H. Beswick, Architect, Newgate-street, Chester	do.
Bakery, Ton Pentre, Rhondda Valley		W. D. Morgan, Architect, Pentre, Glam	do.
Sewerage Works	Plymouth Corporation	J. Mansergh & Son, Engineers, 5, Victoria-street, Westminster	do.
Sewerage Works, near Huddersfield	New Mill U.D.C.	Marriott & Co., Engineers, Dewsbury	do.
Drainage Works, &c.	Bristol Corporation	T. H. Yabbicorn, Civil Engineer, 63, Queen-square, Bristol	do.
Schools, Hyde Park-road	Plymouth School Board	H. J. Snell, Architect, 11, The Crescent, Plymouth	do.
Three Houses, Ruston Hill, Pellon, Halifax		A. G. Dalzell, Architect, 15, Commercial-street, Halifax	May 28
Sewers, &c.	Andershaw (Lancs)	J. P. Wilkinson, Civil Engineer, 47, Arcade Chmbrs., Manchester	do.
Additions to Hospital, Thorpe, Co. Durham	Easington R.D.C.	Farthing & Dunn, Architects, Newcastle-on-Tyne	do.
Reconstruction of Houghal Burn Bridge	Tanfield (Durham) U.D.C.	R. Heslop, Surveyor, Burnopfield	do.
Police Station, Foleshill	Coventry Corporation	J. E. Swindlehurst, Engineer, St. Mary's Hall, Coventry	do.
Bridge Works, Penkridge-road	Cannock (Staffs) R.D.C.	H. M. Whitehead, Surveyor, Penkridge, Staffs	do.
Station, Bridge, &c., Ansdell, near Lytham	L. & Y. & L. & N. W. R. Co.	R. C. Irwin, Hunt's Bank, Manchester	do.
Road Works, Hartwell-street	Litherland (Lancs) U.D.C.	A. H. Carter, Surveyor, 25, Sefton-road, Litherland	do.
House, Fisher Farm Reservoir	Kendal Corporation	J. Stalker, Architect, Kendal	do.
Wall Works, &c.	Lancaster Corporation	Borough Surveyor, Town Hall, Lancaster	do.
Dutch Barn	Burnley Guardians	S. Keighley, Architect, 27, Nicholas-street, Burnley	do.
Isolation Hospital, Ryton-on-Tyne	Ryton U.D.C.	J. P. Dalton, Surveyor, Ryton-on-Tyne	do.
Offices at Steelworks, Llanelly		T. Arnold, Civil Engineer, Castle Buildings, Llanelly	May 29
Factory, Offices, &c., Lockwood, Huddersfield	Messrs. D. Brown & Sons	J. Berry, Architect, 3, Market Place, Huddersfield	do.
Residence, Victoria Esplanade, Morecambe	Mr. W. Duff	Cressey & Keighley, Architects, Bank Chambers, Morecambe	do.
Business Premises, Carter-street, Goole		F. Chambers, Architect, Clifton-gardens, Goole	do.
College Buildings, Arnside, near Kendal		J. Stalker, Architect, Kendal	do.
Workshops, Highroad Well, Halifax		L. Coates, Architect, Warehouse-street, Halifax	do.
Additions to Farm Buildings, Wardhouse, Aberdeen		J. Craigen, 193, Union-street, Aberdeen	do.
Sewerage Works, Stonnall	Lichfield R.D.C.	W. E. Rogers, Surveyor, Rugeley	do.
Culvert, &c., Kirk, Langley	Belper R.D.C.	R. C. Gordon, Engineer, Hazelwood, Derby	do.
Fifty-three Cottages, Merthyr	Saxon Building Club	P. V. Jones, Architect, Heugoed	do.
*Sundry Work, Settling Tank at Infirmary	Southwark Union	G. D. Stevenson, Architect, 13 and 14, King-street, E.C.	do.
Fifteen Villas, Gellifaclog, near Merthyr, Wales		W. Dowdeswell, Architect, Treharris	May 30
Library, &c., Trecynon, Aberdare	Trustees	D. H. Elford, Architect, 30, Weatheral-street, Aberdare	do.
Sewerage Works	Sudbury (Suffolk) Corporation	T. Hayward, Civil Engineer, Town Hall, Sudbury	do.
Electricity sub-Station, Cheetham	Manchester Corporation	City Surveyor, Town Hall, Manchester	do.
House, Cultra, Belfast	Mr. F. A. Heron	Young & Mackenzie, Architects, Belfast	do.
School, Belmont, Durham		H. T. Gradon, Architect, 22, Market-street, Durham	do.
Farmhouse, near Pickering		J. Shepherd, Rosedale Abbey, Pickering	do.
Lodge, Entrance Gates, &c., Govilon, Abergavenny	Dr. W. E. Williams	C. T. Evans, 8, Queen-street, Cardiff	May 31
Cottage Homes, Ely	Cardiff Guardians	E. Seward, Architect, Queen's Chambers, Cardiff	do.
Mission Hall, Newtown, Irthington, Cumberland	Rev. T. G. Horwood	J. Mark, Architect, Brampton, Cumberland	do.
Wesleyan School, South Downs, Redruth		H. W. Collins, Architect, Walreddon, Redruth	do.
Additions, &c., Presbyterian Church, Llanelly		W. Wilkins, Athenæum, Llanelly	do.
Bandstand, &c.	Hythe Corporation	A. S. Butterworth, Civil Engineer, Hythe	do.
Reservoir, &c.	Wingate (Durham) Water Co., Ld.	T. Bower, Engineer, Ribble House, West Hartlepool	do.
Macadam (580 tons)	Little Woolton U.D.C.	R. Simmons, Surveyor, Grange-lane, Gateacre	do.
Foundations, &c., at University, Birmingham		Aston, Webb & Co., Architects, 19, Queen's Gate, S.W.	June 2
Refuse Destructor, Swansea		G. Bell, Borough Surveyor, Swansea	do.
School, The Causeway	Aberavon (Glam.) School Board	Thomas & James, Architects, Aberavon	do.
Warehouse, Farnworth, Lancs.	Industrial Co-operative Society	J. H. Taylor, Architect, 15, Grove-street, Farnworth	do.
Boiler House, &c., Cape Mills, Farsley, Yorks		W. D. Gill, Architect, Stanningley, Leeds	do.
Extension of Hospital, Darlington		Hoskins & Henman, Architects, Court Chambers, Darlington	do.
*Alterations, Underground Convenience, London Wall	Engineer's Office	Engineer's Office, Guildhall	June 3
*Repair of Tar and Asphalte Paving	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham	do.
*Road Making and Paving Works	Leyton U.D.C.	Council's Surveyor, Town Hall, Leyton, E.	do.
Water Supply Works, Pleasley, Manchester	Blackwell R.D.C.	G. & F. W. Hodson, Engineer, Loughborough	do.
Road Materials, &c.	Andover R.D.C.	J. Wormald, Surveyor, Andover	June 4
Concrete Landing Slip, Culkeia, Assynt	Sutherland County Council	D. & C. Stevenson, Engineer, 84, George-street, Edinburgh	June 5
*Supplying and Fixing Slipper Baths	Lambeth Borough Council	Borough Engineer, Town Hall, Kennington Green	do.
School, Pentre, Wales	Ystradyfodwg School Board	J. Rees, Architect, Pentre	June 9
Water Supply Works, Kingsbury, Somerset	Langport R.D.C.	Bailey, Denton & Co., Civil Engineers, Palace Chambers, S.W.	do.
Maisonette Dwelling Houses, Barnes	West Ham School Board	F. & W. Stocker, Architects, 90 and 91, Queen-street, E.C.	do.
*Cleansing, Painting, and Repairs of 18 Schools	Langport R.D.C.	Borough Engineer, Town Hall, West Ham, E.	do.
*Thirteen Miles Iron Mains, &c.	County Borough West Ham	The Clerk's Office, Langport, Somerset	June 10
*Paving Sides of Roads	Great Western Railway Co.	W. Jacques, Architect, 2, Fen-court, E.C.	do.
Warehouse, Moyreth Dock, Birkenhead	Bridgwater (Somt.) Town Council	G. K. Mills, Paddington Station	do.
Sewers	West Ham Council	W. T. Baker, King-square, Bridgwater	do.
*Erection of Mortuary, Canning Town	do.	Council's Engineer, Town Hall, West Ham, E.	do.
*Making-up Streets	Lambeth Guardians	do.	do.
*Painting Works at Infirmary, Brook-street	Newport (Mon.) Corporation	Clerk's Office, Brook-street, Kennington-road, S.E.	June 11
Bridge over River Usk	Rugby Co-operative Society	Borough Engineer, Town Hall, Newport	June 16
*New Buildings, &c.	Edmonton School Board	J. T. Franklin, Architect, Regent-street, Rugby	June 17
*New Schools at Montague and Houndsfield-roads	Wallasey R.D.C.	Board's Architect, 99, Church-street, Lower Edmonton	do.
Reservoir, &c., Gorsehill, New Brighton	Hammersmith Guardians	J. H. Crowther, Engineer, Great Float, Birkenhead	June 19
*New Workhouse and Infirmary	Trustees Lambeth Hayles Charity	Giles, Gough & Trollope, Architects, 28, Craven-st., Strand, W.C.	June 23
*Tenement Houses, Southwark		Waring & Nicholson, 38, Parliament-street, S.W.	No date
Sixteen Cottages, Whaley Bridge		Woodhouse & Willoughby, Architects, 100, King-st., Manchester	do.
Vicarage, Burstwick East, Yorkshire		Brodrick & Co., Architects, Bridlington	do.
Schools, Bloxwich, near Walsall		Hickton & Farmer, Architects, Walsall	do.
Additions to Loxwood House, Rudgwick		Wheeler & Lodge, Architects, Bank Chambers, Horsham	do.
Additions to Farm House, Oakworth, Yorks		Judson & Hudson, Architects, Oakworth, near Keighley	do.
Two Houses, Pinner		Clarke & Charles, Harrow-on-the-Hill	do.
Municipal Buildings, Barrhead (N.B.)	Messrs. J. Fletcher & Sons	Stirling & Cameron, 102, Bath-street, Glasgow	do.
Schools, Hall, &c., Fosse Bank, Tonbridge	War Department	J. W. Little, Architect, 149, High-street, Tonbridge	do.
Factory, Heanor	Carlisle South End Co-op. Soc. Ld.	A. Marshall, Architect, King-street, Nottingham	do.
*Painting Works, Derby, Leeds and Sheffield		Royal Engineer's Office, Fishergate, York	do.
*Heating New Buildings		T. Taylor Scott, Architect, 43, Lowther-street, Carlisle	do.

[See also next page.

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PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Superintendent of Roads	Fulham Borough Council	150*l.*, &c.	June 2
*Building Inspector	Tottenham U.D.C.	175*l.*	June 3
*Quantity Surveyor's Assistant	London County Council	3*l.* 13s. 6d. per Week	June 9
*Clerk of the Works	St. Pancras Guardians	4*l.* 4s. per week	No date

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p. iv.* *Contracts, pp. iv. vi. viii. & x.* *Public Appointments xx. & xxi.*

PRICES CURRENT (*Continued*).

TILES.

	s.	d.		
Best plain red roofing tiles	41	6	per 1,000, at rly. depôt.	
Hip and valley tiles	3	7	per doz.	,, ,,
Best Broseley tiles	48	6	per 1,000	,, ,,
Hip and valley tiles	4	0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57	6	per 1,000	,, ,,
Do. ornamental Do.	60	0	,,	,, ,,
Hip tiles	4	0	per doz.	,, ,,
Valley tiles	3		,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50	9	per 1,000	,, ,,
Hip tiles	4	1	per doz.	,, ,,
Valley tiles	3	8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 0 0
Deals: best 3 by 9	13 10 0	15 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	10 10	11 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in. less than best
Deals: seconds	1 0 0	less than battens.
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2 in. by 4½ in. and 2 in by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards—1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
Pitch-pine timber (30 ft.)	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
,, ,, 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg: First white deals, 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
,, ,, ,, 3 in. by 9 in.	12 0 0	13 0 0
,, ,, ,, battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
¾ in. do. do.	0 0 7	- - -
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—Per ft. cube	0 3 0	0 3 6

	Per square. £ s. d.	£ s. d.
Prepared Flooring— 1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
6 in. at 6d. per square less than 7 in.		
1 in. by 7 in. white, planed and shot	0 11	0 12 6

PRICES CURRENT (*Continued*).

WOOD.

	Per square £ s. d.	£ s. d.
Prepared Flooring— 1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6
6 in. at 6d. per square less than 7 in.		

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London £ s. d.	£ s. d.
IRON— Common Bars	7 15 0	8 5 0
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 10 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	10 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g.	16 0 0	- - -
,, ,, 22 g. and 24 g.	16 10 0	- - -
,, ,, 26 g.	18 0 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 0 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 5 0	9 15 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 7 6	- - -
Pipe in coils	14 17 6	- - -
Soil Pipe	17 7 6	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet per lb.	0 1 0	- - -
Thin ,,	0 1 1½	- - -
Copper nails ,,	0 1 1½	- - -
BRASS— Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3½	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8½	- - -
Blowpipe ,,	0 0 10	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths	3d. ,, ,,
26 oz. thirds	4¼d. ,, ,,
,, fourths	4d. ,, ,,
32 oz. thirds	5¼d. ,, ,,
,, fourths	5d. ,, ,,
Fluted sheet, 15 oz.	3d. ,, ,,
,, 21 ,,	4d. ,, ,,
⅛ Hartley's Rolled Plate	2d. ,, ,,
⅜ ,, ,, ,,	2¾d. ,, ,,
½ ,, ,, ,,	2¾d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes	per gallon	0 2 8
,, ,, ,, in barrels	,,	0 2 9
,, ,, ,, in drums	,,	0 2 11
Boiled ,, in pipes	,,	0 2 10
,, ,, ,, in barrels	,,	0 2 11
,, ,, ,, in drums	,,	0 3 1
Turpentine, in barrels	,,	0 2 8
,, in drums	,,	0 2 10
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	,,	20 10 0
Best Linseed Oil Putty	per cwt.	0 8 6
Stockholm Tar	per barrel	1 12 0

PRICES CURRENT (*Continued*)

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

"Juno" (Nothing would be really satisfactory except relaying the floors with grooved and tongued boarding. The existing boards, if in good condition, might be treated in this way, and the deficiency made up with a few new boards).——J. B.—M. & C. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

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Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ABERBEEG (Wales).—For the erection of twenty-two cottages, for the Building Club. Mr. G. C. Hillard, architect, Market-chambers, Abertillery:—

John Newcombe	£5,830	Gould & Mills	£4,070
Williams & Rogers	5,720	David Lewis, Aberbeeg*	4,180
David Lewis	5,025		

ABERTILLERY.—For the erection of twenty-two double cottages, Abertillery, Mon., for Tylery Building Club. Mr. Geo. C. Hillard, architect and surveyor, Market-chambers, Abertillery:—

David Lewis	£5,280	D. Powell	£4,936
R. Tudor	5,038	Noel Bagley	4,796
Jno. Jones	5,005		

BARNSLEY.—For the erection of four houses, Smithies-ane. Messrs. Wade & Turner, architects, 10, Pitt-street, Barnsley. Quantities by the architects:—

Building.—R. Ruffles	£625 0
Joinery.—W. Dyson	200 0
Plumbing.—B Denison	27 10
Slating.—M. Fleming	64 5
Plastering.—M. Fleming	57 5
Painting.—B. Dwight	16 16

[All of Barnsley.]

BRISTOL.—For the erection of a retaining wall and other incidental work, for Mr. Heber Mardon. Mr. T. J. Moss-Flower, C.E., Baldwin-street, Bristol, and 28, Victoria-street, Westminster, S.W.:—

E. Preece	£344 14 6	Walters & Son	£250 0 0
Thatcher Bros.	280 0 0	J. Perkins, Bristol*	240 0 0
Cowlin & Son	251 0 0		

BRISTOL.—For the conversion of two dwelling houses into shops, &c. Mr. T. J. Moss-Flower, architect, Baldwin-street, Bristol:—

E. Preece, ristol* £331

[*See also next page.*

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CARDIFF.—For the erection of chapel at Cardiff, for the Presbyterian Church of Wales. Mr. Edgar G. C. Down, architect, 31, High-street, Cardiff :—

Thomas & Co.	£6,970 0 0	C. C. Dunn ..	£6,200 0 0
G. Griffiths ..	6,778 5 0	Thomas & Sons	6,149 0 0
D. W. Davies	6,632 0 0	Turner & Sons	6,141 0 0
Shepton & Sons	6,455 10 0	Price Bros. ..	6,051 6 4
F. Williams ..	6,332 0 0	Evans & Bros.	5,799 9 8
Lattey & Co.	6,240 0 0	W. T. Morgan*	5,680 0 0

CHESTERFIELD.—For the erection of new stores, &c., West Bars, for the Chesterfield and District Co-operative Society. Messrs. G. Haslam & Son, architects, Euclid House, Ilkeston :—

Jno. Wright	£2,645	A. B. Clarke, Blue Bell Hill, Notting-ham* ..	£2,500
J. H. Vickers, Ltd..	2,620		
G. A. Pilliatt	2 570		
Fredk. Lee	2,550	Davison & Son	2,359

HANLEY.—For additions to Dalehall Manufactory, for Messrs. Keeling & Co. Messrs. R. Scrivener & Sons, architects, Hanley :—

Meikl-john & Son	£820	Grant & Son	£768
J.& S Wilton	816	W. Cooke	749
G. A. Foster	784	J. J. Longden, Burslem*	748
F. Godwin	770	Bennett Bros.	739

HIGHAM FERRERS.—For the erection of two semi-detached houses. Mr. Geo. Hall, architect, Highham Ferrers :—

T. Wilmott, jun. ..	£629 10	Peter Ireson, High-am Ferrers*	£526 0
E. Mitchell	625 0		
T. & C. Berrill	567 0		

NORTHAMPTON.—For additions to the Northampton General Infirmary. Mr. F. W. Dorman, architect, Northampton :—

A. J. Chown	£34,550	C. W. Souster	£31,000
Pullen & Sons	34,459	R. Cosford	30,989
G. Henson	33,475	J. T. Wingrove	30.702
J. Rowbothan	32,777	H. Green	30,467
Johnson & Son	32,700	A. P. Hawtin	30,150
H. Branson	32,000	Brown & Sons	30,100
Higgins	31,300	E. Archer	29,278
Sharman & Son	31,280	H Martin*	28,640

SHERWOOD (Notts).—For alterations and additions to the Robin Hood Inn. Mr Fred C. Martin, architect, Angel-row, Nottingham :—

Cooper & Son	£750	F. Messom	£687
Fish & Son	732	J. H. Vickers, Ltd., Nottingham*	683
Wm. Maule	723		
A. B. Clarke	700		

LONDON SCHOOL BOARD TENDERS.

AT the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect :—

* *Recommended for acceptance.*

The exteriors of the following schools will be painted between May 24, 1902, and June 21, 1902 :—

EGLINTON-ROAD :—

Hayter & Son	£225 0	H. Groves	£189 0
J. Harries	216 0	E. Proctor*	159 10
W. Jolly	190 10		

HAWLEY-CRESCENT :—

M. Pearson	£255	Marchant & Hirst	£228
W. Chappell	230	T. Cruwys*	220

MONTEITH-ROAD :—

T. H. Jackson†	£521 10	Dolman & Co.	£353 0
Gibb & Co.	519 0	A. E. Symes	340 0
J. F. Holliday	436 0	Vigor & Co.	333 0
Corfield & Co.	413 0	A. J. Sheffield*	324 0
G. Wales	389 0		

NYNEHEAD-STREET :—

S. Musgrove	£194 1	H. Groves	£139 0
Hayter & Son	190 0	W. J. Howie	138 10
W. Banks	169 10	G. Kemp*	130 0
J. & C. Bowyer	169 0		

ROMAN-ROAD :—

Gibb & Co.	£481 0	Dolman & Co.	£402 0
G. Wales	428 0	Vigor & Co	369 0
Corfield & Co.	408 0	Haydon & Sons ..	292 10
T. H. Jackson	403 5	A. J. Sheffield* ..	290 0

ROTHERHITHE NEW-ROAD :—

H. Line	£279 0	W. Banks	£237 0
Greenwood	261 18	Johnson & Co.	175 10
T. D. Leng	252 0	Sayer & Son*	174 0
J. Harries	241 0		

ST. DUNSTAN'S-ROAD :—

C. Gurling	£226 10	W. Chappell	£198 10
F. Chidley	226 0	Chinchen & Co. ..	179 0
W. R. & A. Hide..	214 0	W. Hammond*	149 0

SIDNEY-ROAD :—

T. Willson	£259 0	Chessum & Sons..	£184 0
Collis Willmott & Son	235 0	M. Pearson	180 0
Silk & Son	217 10	Barrett & Power ..	177 0
W. Martin	199 0	G. Barker*	168 0

WOODLAND-ROAD :—

J. Harries	£430	G. Kemp	£256
J. & C. Bowyer	326	Maxwell Bros., Ltd.*	246
Levey & Son	279		

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The Builder.

LXXXII.—N. 3095. MAY 31, 1902.

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London County Council and Technical Education.

THE recent publication of the Annual Report of the Technical Education Board of the London County Council, covering a period of a year from March, 1901, to March, 1902, comes at a very apposite time. The recent debates in the House of Commons on the Government Education Bill will have directed public attention to the question of technical education. This Report of the London County Council ought to give encouragement to those who are anxious to see greater educational progress in England. For it clearly indicates that, backward though we may be, advance, at any rate in London, is being steadily made every year. Before, however, making any comments on this Report, it is only right to congratulate the Council on its fulness and completeness. We would more especially draw attention to the interesting maps showing the distribution according to residence in the Metropolitan Boroughs of men and boys who are working in different occupations. There is one, for example, showing the number of bricklayers and bricklayers' labourers, another of those in the plumbing trade, another for the painting and decorating and glazing trade, and also one for the carpentering trade. It is to be regretted, however, that this Report is not published in a more convenient shape; it is issued in a folio volume of something over a hundred pages; if ordinary persons are to purchase it and to keep it, it should be half the size, and it would then be of such a shape that it could be easily preserved on library shelves so as to form a valuable history of the development of technical education in London.

The Council very properly commence their Report by giving a definition of the expression "technical education" and of the policy of the Council in regard to it:—

"The expression 'technical instruction' shall mean instruction in the principles of science and art applicable to industries, and in the application of special branches of science and art to specific industries or employments. It shall not include teaching the practice of any trade or industry or employment, but shall include instruction in the branches of science and art with respect to which grants are for the time being made by the Department of Science and Art, and any other form of instruction (including modern languages and commercial and agricultural subjects), which may for the time being be sanctioned by the Department by a minute laid before Parliament and made on the representation of a local authority that such a form of instruction is required by the circumstances of its district.

The expression 'manual instruction' shall mean instruction in the use of tools, processes of agriculture, and modelling in clay, wood, or other material."

In accordance with the above section, the Science and Art Department (now the Board of Education, Secondary Branch) sanctioned, as "required by the circumstances of the district," a list of 109 additional subjects or forms of instruction, by minute laid before Parliament in 1893.

The general policy to be pursued was laid down by the Council on the establishment of the Board in February, 1893, in the following resolution:—

"That, without committing itself to details, the Council considers that every district of London ought to be adequately provided with technical education of every grade, rising from the school to the workshop and the University, and appropriate to the chief occupations of its inhabitants; that existing institutions of each grade should be systematically co-ordinated to avoid overlapping and to provide for continuous education; and that early provision should be made, in whatever manner may be found expedient, for supplying the gaps at present existing; that the most pressing want is further inducements and facilities for the poorest parents to keep their children at some secondary or continuation school after leaving the elementary school; that the Council therefore instructs the Technical Education Board to provide as its first duty considerable further facilities for practical and technical education in the poorer and manufacturing districts of London, provided that no scholarship be given of a less value than 10*l.* per annum; and that the Council, recognising the value of the comprehensive Report prepared by Mr. Llewellyn Smith, refers it for the information of the Technical Education Board."

The progress which has been made since the Council undertook the technical education for London is thus clearly stated:—

"There are now in London no fewer than thirty-five well-equipped and efficient centres of definitely practical instruction in various trades, in which, during the present session, about 200 separate courses on practical trade work, each often including several classes, are being conducted. All but seven of these centres owe either their establishment or their extension, together with part of their maintenance, to the funds of the Council. In all the various sections of the building, engineering, printing, furniture, silver working, carriage-building, baking, and leather trades, in particular, the London artisan has now within easy reach, at nominal fees, opportunities for thoroughly perfecting himself in his trade which, taken as a whole, are second to none in the kingdom. Excluding the more sparsely populated suburbs, there is now in nearly every district an institute of this sort within half an hour's walk; and, as regards the greater part of the country, one within a quarter of an hour's walk. Nearly a dozen new institutions, or considerable extensions of existing institutions of this kind, are at this moment in progress."

We have reiterated over and over again that in order to have a good system of technical education it is necessary that a pupil should be properly trained in general education. We are glad to see that the Council insists on this point; they state that there is a very large consensus of opinion among the heads of chemical and other manufactories to the effect that to enable English industrial enterprise to hold its own against foreign competition the chief requirement is a thoroughly sound secondary education up to the age of eighteen or thereabouts, an education which is devoted more to the training of the intellectual faculties than to the acquisition of knowledge, however directly that knowledge may bear upon the industry in which the student is subsequently to be engaged. For the leaders of industry it has been pointed out that the first requirement is this thorough training of the faculties in the secondary schools, and that in this respect the student who has passed through the German gymnasium has an advantage as a rule over the English student who, having obtained an education in an ordinary secondary school, proceeds to a technical college or a university college for the study of science.

This necessity for a sound general education is the more important because it is clear that a large number of the younger workers of London are recruited from the provinces, a fact which makes the necessity of good education in the rural districts still more important. This fact is so important that it is desirable to give the conclusion arrived at by the Special Sub-Committee on the Building Trades in their own words:—

"What was felt, however, to be perhaps the most urgent need in connexion with the building

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trades was the establishment of special building trade schools, which should provide a practical training for boys who leave the public elementary schools at the age of thirteen or fourteen. The evidence laid before the Sub-Committee tended to show that the building trades are now to a large extent recruited, not from London lads, but from men imported from the provinces. It was stated that London boys experience great difficulty in gaining admission to the trades. Whatever the economic and trade conditions may be which give rise to this state of affairs, it would seem that the best remedy is to be found in the establishment of special schools, which, without being imitation workshops like some French apprenticeship schools, should be avowedly devoted to the training of those lads who intend to enter the building trades, and should give a thorough course of at least two years' duration in manual training, and in the application of arithmetic, drawing, geometry, physics, and mechanics to such simple problems as would naturally arise in the actual practice of some branch of the building trades. The instruction might be of such a nature that a lad, on leaving school, would be able to enter a workshop, and to show that he has such knowledge of workshop methods and of the application of scientific principles to his work, together with such training of hand and eye, and such manual dexterity, as will render him in a few weeks deserving of a living wage, while he takes such an intelligent interest in his work as to be free from the great objection raised against boys generally, of their lack of interest, intelligent appreciation, and discipline."

Important as the whole Report is, space will only allow of noting a few points in regard to it. One of these, of considerable interest, is that during the present session 4,000 persons, making an average attendance of about sixty hours, are learning what we may call the theory of building. The practical work undertaken at the various classes consists largely of geometrical and gauged work, niches, "circle on circle" moulds, jambs, and segmental and elliptic arches. The work is set out by the students themselves. More than 300 young bricklayers now pass through these classes every year. In addition to classes for the building trade, numerous classes are held in builders' quantities. One great advantage of these classes is that they enable superior workmen, builders' clerks, and others, not only to fit themselves to become clerks of works, but even to become quantity surveyors—in other words, they enable any young and intelligent artisan in the building trade to rise from being a workman to a master, and, in fact, give him the most unlimited opportunities, one may say without exaggeration, of making a large income in the higher branches of the building trade.

It is altogether impossible to do justice to this interesting Report in a short space; it contains so many facts and statistics which are inseparably united. It shows, however, what we have always insisted on, that the Englishman is not behind the German or the American in natural abilities. He has been handicapped by the want of systematic education; and in London, at any rate, this defect in all its branches has clearly been remedied. But this Report is instructive from another point of view. Rome was not built in a day, and no amount of popular enthusiasm will construct the system of technical and secondary education without much labour and a lapse of a considerable time. The London County Council have been at work on the subject for nine years, and we are not beyond the mark when we say that it is only now that anything approaching a satisfactory system has been established in full working order.

SCULPTURE AT THE ROYAL ACADEMY.

AFTER the vast extent of the sculpture court at Paris, the two rooms at the Academy seem indeed a very restricted field for the exhibition of the most intellectual of the plastic arts; and yet even these small spaces are not filled with works of high importance. English sculpture has made immense progress during the last ten or fifteen years, and at its best it is not much below the best French sculpture now, only that English sculptors seldom or never seem to rise to the height of the interesting and suggestive intellectual conceptions we meet with from the greatest French sculptors. And even as far as Academy sculpture goes, this cannot be said to be a good year in sculpture.

The largest work, the colossal equestrian statue of Edward the Black Prince, by Mr. Brock, finds place in the courtyard. This is one of several modern equestrian statues which seem to owe their inspiration to the Colleoni statue, in respect of largeness and dignity of manner, and the firm seat and proud attitude of the rider. The personality of the Black Prince can of course only be a sculptor's conception, since no data exist for a likeness. Mr. Brock shows us a grand looking man, in a grand suit of armour, on a grand horse; that is about what it comes to; as a monumental work there is dignity enough in it, and it would certainly look well in the middle of a public square; but we cannot say that it interests us very much. The pedestal, as usual in these cases, is somewhat coarsely designed and profiled; it may, however, be only a temporary pedestal for the present position, and may be regarded as so far adequate.

Coming into the Central Hall, we are sadly in want of any work which by its importance and scale forms a central and dominating work. Mr. Brock has two heroic-size modern figures; one of them a bronze figure of a Royal Scots Fusilier to be erected at Ayr in memory of soldiers of the regiment who have fallen in recent campaigns in India and Africa; the other a marble statue of Gladstone, to be placed in Westminster Abbey, and which will certainly be one of the best memorial statues in that curious collection. He has clothed the figure in a gown of some official kind, thus obtaining some sculpturesque drapery and getting out of the frock-coat difficulty; and the face is full of vigour and character; as a portrait statue it takes a high place; but portrait statues are not what the art of sculpture was created for. The memorial Fusilier is spirited, and Scotch enough; it suggests, indeed, Burns in military uniform, and is so far true, no doubt, to the Ayrshire type. It may perhaps be the most suitable kind of memorial statue for the purpose; the most generally recognisable and intelligible; conditions which a memorial of this kind, appealing to the public spirit of a district, should undoubtedly possess. But this is sentiment rather than art, and we confess that boots and accoutrements in sculpture, even in bronze (which is no doubt better suited to them than marble) do not appeal to us; such things have to be done occasionally to meet popular wishes, but one can only condone them, not sympathise with them.

As against these portraitures, the only large work in the Central Hall which belongs to the province of idea sculpture, the Countess Gleichen's "Part of a Fountain Erected in Paris," can hardly claim higher praise than that of being pleasing. It consists of a fountain basin flanked by dolphins which form part of the margin, their tails joining the pedestal at the back, their heads coming to the front of the ramp; and between them, on the lower portion of the pedestal, the time-honoured bearded mask from the mouth of which, presumably, the water is to issue. These are trite properties enough. Above the pedestal rises the nude figure of a woman with a water-jar on her shoulder; a graceful figure, but hardly one to go out of one's way for. Mr. Clemens's recumbent "Sappho" does not help our ideal much, and is a tame work. Mr. Taubman's "Fairy Tales" is better than either of these; it has individual charm and expression; it is a bronze, rather under life size, of a nude young girl half reclined on the ground, looking upward with an expression of eager interest in her face. This is a work which, besides being well modelled, has point and meaning. The Hall contains three efforts in decorative work, of which the most satisfactory on the whole is Miss (?) Steele's "Design for Bronze Sun-dial." This is a support on a tripod plan, divided into three faces each of which contains a bas-relief draped figure; the figures are divided by vertical bands which, like the supports at the foot of the whole, are well designed for metal and have the proper character for the material, and the outline and balance of the whole is satisfactory. This certainly cannot be said of the more ambitious "Decoration for a chimney piece" by Mr. Alexander Fisher, who is a very good decorative artist in metal and enamel, but has rather gone beyond his tether in this tumultuous composition of groups of figures running in and out of caverns one does not know why; it is true we are told it is "The Past, Present, and Future," and there is exceedingly hackneyed poetical quotation tacked on to it; but it does not any the more explain itself; and as to its being "Decoration" for a chimney-piece, the total effect is anything but decorative, and quite out of place for such a situation. Mr. Hodge's "Baptismal Font" is decorated with attached figures of children at the angles, well modelled and well connected with the bowl, but there is a want of any Christian symbolism or suggestion, which surely a font should have. The centre of the Hall is occupied by Mr. Swan's model of a wounded leopard, admirable in its way, but a rather poor centre-piece; and one gets somewhat tired of these animal subjects—the materialism of modelling.

In the Lecture Room the scene is more encouraging; though there is not here anything that can be called a great work in sculpture. But we find prominent among the works placed against the walls of the room Mr. Colton's fine alto-relief group "The Crown of Love," which was exhibited in plaster last year and is now to be seen in marble. This is a work which is sculpturesque in character and design, and moreover contains a fine idea; what is wanting to make it entirely satisfactory and impressive it would be difficult to define precisely, but one cannot help feeling that the sculptor has just fallen short of what the work seems to aim at; it is, however, a fine and interesting piece of sculpture. It would

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have gained something if the group had been enclosed in a decorative framing, instead of being left with the rough marble as a ground for the figures. Among the works placed in the centre of the floor is another group by Mr. Colton, "The Springtide of Life," which, less serious in its aim than his larger work, is more satisfactory in that it is more completely successful; it represents two children, a young girl and an infant boy with whom she is playing, putting her arm round his waist apparently with the intent to tumble him into the water; so we read the incident at least; it is a light piece of *genre* sculpture of a playful kind, but the girl's figure is admirably modelled, and the whole group complete and spirited in conception and execution. On the whole we may say that, taking his two works together, the honours of the sculpture are with Mr. Colton this year. Mr. Reynolds Stephens exhibits one of those productions, half sculptural, half decorative in aim, which represent a recent movement in English sculpture, first suggested perhaps in such works as the late Mr. Onslow Ford's "Music" and "Applause," and which Mr. Stephens has developed more than any one else. It is a high narrow bronze pedestal supporting a group of father, mother and infant, a pretty but not remarkable group in a sculptural sense; the octagonal pedestal is divided by uprights which branch out at the top into rather too naturalistic foliage, each division being further marked by a small bird perched on a part of the ornament, all of them symmetrical in design and all turned one way, so as to impart a kind of circular movement to the design. It is entitled "Love's Coronet," and is a production which must, to be fairly judged, be regarded as a whole, pedestal and group together—as an ornamental work with a pleasant symbolism in the details; not as mere sculpture. Next to this comes a production of a higher class, the "Askos and Kylikes" of Mr. Oliver Wheatley. Here a nude Greek youth is seated holding out at arm's length a kylix (flat Grecian cup) on which he has been working, to study its effect; one or two other similar vessels lie at his feet. This is one of those works in sculpture which, without any inner or symbolical meaning, represent with a happy truth and grace a moment of human action—an instant of life seized and embodied in sculptured form; and as such this is one of the best productions of this year's sculpture. Mr. Forsyth's recumbent figure of the late Bishop of Wakefield is not more than the kind of memorial sculpture which may pass muster in a cathedral, and Mr. Bertram Pegram's "Down to the Sea" is not more than *genre* of a harmless kind. Mr. Swan's "Boy and Bear Cubs" is also *genre*, but a great deal more incisive and characteristic in treatment; the thin figure of the boy turning half round to repel one of the cubs, is a capital piece of life-like work; as to beauty, Mr. Swan does not seem to aim at that quality in sculpture; life-likeness in a material sense seems to be enough for him; and no doubt materialism with first-rate execution is better than idealism with second-rate execution.

The memory of Mr. Onslow Ford is represented by five portrait busts, none of them of very special interest, and two small ideal works. One of these is a small and delicately modelled recumbent marble figure under the title "Snowdrift," a nude figure reclined on a couch of snow, which gives one a rather painful sense of chilliness—perhaps what was intended; it is a pretty and delicate fancy. The other is a small silver group of "St. George and the Dragon;" that is to say, all is silver except the face of the knight carved in ivory; the rest is silver armour. The dead dragon beneath his feet is very finely treated so as to be really decorative in effect; it is a very successful little work of its class. Mr. Thornycroft exhibits a portrait bust and four small figures; a realistic statuette of a working man under the title "Pay Day;" a small bronze nude—"By the Sea," not remarkable; a bronze of a sleeping cat; and a silver model of his "King Alfred Memorial at Winchester." It is difficult to form an estimate of what is probably a work over life-size from this model; it shows the King as an armed man holding up his sword; a dignified figure, standing on an irregular mass representing natural rock—a kind of pedestal we hardly like; it is a method of treatment which seems like evading a difficulty. This kind of treatment is supposed, no doubt, to give a rugged grandeur to a monumental work, but it is rather a piece of false sentiment; the pedestal, like the statue, should be a work of art and design; natural realism is out of place.

Among the other works ranged round the walls, one of the largest is an alto-relief ("bas-relief" it is called, but hardly with correctness, since the figures are almost entirely made out in the round) by Mr. H. A. Pegram, entitled "A Sea Idyll," and which gives the impression of representing the nude figures of a mother and her two little boys playing in the surf, though a more romantic meaning may be intended. As the work of a very capable sculptor it is rather disappointing, and hardly justifies its scale; there is a want of style about it, and it gives too much the impression of being a sketch which was hardly worth lifesize scale. Mr. Goscombe John's bas-relief "Memorial to Sir Arthur Sullivan," to be executed in bronze for St. Paul's Cathedral, is a plaster *maquette* fixed too high up on the wall to be very well seen. It is in the form of a large tablet with a bust of the composer flanked by two small cherubs or genii, with a figure above which probably represents "Music," and which is not as interesting or original as Mr. John's figures usually are; the effect of the whole, however is agreeable and decorative, and very suitable as a memorial.

Following some of the smaller works round the walls, we find two miniature bronze heads by Mr. G. Frampton, "The Lady of the Isle of Avelyon" and "Lyonors" (the latter name we presume is out of the "Morte d'Arthur," though we do not recollect it at the moment); they are placed as pendants on either side of the doorway, and are heads with a great deal old-world poetic suggestion about them. Mr. Goscombe John's "Merlin and Arthur" and Mr. C. J. Allen's "Rescued" are two fine little groups on a small scale; the latter, a father, mother and infant, is very expressive and well-composed group, and would be worth carrying out on a larger scale. Mr. Mark Rogers's "L'Allegro" is a well-executed low-relief head; the expression does not, however, answer to the title. Mr. Frampton's low-relief panel in memory or in honour of Mr. James Fleming, to be executed for the Glasgow School of Art, is a memorial panel of considerable beauty and originality. It shows a low-relief portrait head in the centre (we wish the artist could have dispensed with the realistic coat-collar), and a decorative design on each side consisting of conventionalised trees with bells hung between them—a symbolism, probably, to which we have not the clue; but the whole work is very graceful and in the most refined taste.

One of the most noticeable points in English sculpture of late years has been the attempt to treat the bust as something more than a mere effort of portraiture; to give to the portrait bust, on the one hand, a certain idealised character, and on the other hand to use the bust as a form of ideal creation in sculpture. The present exhibition, amid a good many examples of the mere portrait bust, in which a faithful likeness is the main object, contains some instances of both the classes of work above referred to. Mr. Frampton's bust of the Marchioness of Granby—his diploma work—is an example of the portrait bust with a certain degree of poetic and decorative character imparted to it by the method of treatment and the ornamental accessories attached to it; it is in every respect a most refined and delicate piece of work. Mr. Arthur C. White, a sculptor whose name we do not remember before, illustrates the ideal expressed in a bust in two works, the sweet thoughtful-looking head entitled "Isabella," and a weird bronze head in which he has symbolised Shelley's conception of "The Witch of Atlas"; and Mr. Lucchesi attempts an even more fanciful creation in his bust entitled "Sunflower," a terra-cotta head growing out of broad green leaves, in which the wistful expression of the face, with lips parted, further carries out the ideal suggested in the title. As a contrast we have Mr. Stirling Lee's almost humorous sketch, for it is little more, of the highly characteristic physiognomy of the late Mr. Brett; and a Berlin sculptor, Herr Klein, sends a clever realistic bust of a lady with short dark hair, executed in three different marbles, with the eyes coloured also; a piece of trickery, but very cleverly executed. Mr. Frampton's bust of Chaucer, to be executed in marble for the Guildhall, follows faithfully what is supposed to be (we know not on what authority) the authentic likeness of Chaucer; the half-humorous and half-sensual expression of the face at all events accords admirably with one's idea of the poet of the Canterbury Tales.

Designs for decorative work, which are included among the sculpture—though they ought to have a special gallery and department to themselves, if the Academy were really what it professes to be, an Academy of Arts—are fewer and less important than in some previous years. One or two of the best are we presume by a lady, at least the name is given as "Florence H. Steele," though we observe that the alphabetical list of names does not attach either "Miss" or "Mrs." to the name. The silver-gilt pendant and the yachting trophy of this artist are good work. Mr. Lutiger's "Buckles and brooches" have too much of *l'art nouveau* about them for our taste. A case of medals by Mr. Saulles, who is occupied with the new coinage, show what may be called respectable work, but not of the highest order of the medallist's art.

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NOTES.

Workmen's Compensation Act.

THE case of Cooper and Crane *v.* Wright, reported in our issue of last week, again furnishes an example of the difficulty in construing the Workmen's Compensation Act. This is almost sufficiently exemplified by the fact that the House of Lords was divided in the proportion of three to two, and that the majority were of a different opinion to the Court of Appeal; but, in addition to this, Lord Brampton characterised the Act as calculated to provoke rather than to minimise litigation, whilst Lord Robertson said the Act was incapable of legal construction. The difficulty experienced in the solution of the question as to whether a man subcontracting with a builder who was erecting a building for the building owner was liable to indemnify the builder for compensation the builder had been compelled to pay to the representatives of one of the sub-contractor's workmen, has arisen from the use in Section 1 of the Act of the word "employer," with the limitation contained in Section 7 that the Act only applies to employment by the "undertakers" as defined in the Act. In the case of building operations, the undertakers are defined to be "the persons undertaking the construction, repair, or demolition." The minority in the House of Lords and the Court of Appeal considered this to include only the building-owner himself engaging in such an operation, or some person directly contracting with him; but the majority have taken the wider and, as we venture to think, the more practical view, that, independent of any question of contract, any person actually engaged in the ordinary meaning of the words on any operation of construction, repair, or demolition comes within the "description" contained in the Act. Lord Davey declined to call it a definition. In our "Note" to the case of Wrigby *v.* Whittaker, p. 490 *ante*, we had occasion to point out the difficulty so frequently experienced in determining what constitutes an employer, also an undertaker, so as to bring him within the Act, and we are glad a decision has now been given by the House of Lords on the question of buildings. Equal difficulty and uncertainty, however, still exists in the case of docks, wharves, quays, and warehouses, the Court of Appeal having held a workman working for contractors in painting a ship in dock to be within the Act, because his employers were undertakers having the "actual use or occupation of the dock." No finality can be arrived at short of a decision in the House of Lords.

Electric Lighting at St. Paul's.

BY order of the Dean and Chapter a demonstration of the newly installed electric lighting at St. Paul's Cathedral was given to members of the Press on Wednesday evening. As to the practical side of the installation some information will be found on p. 542; but a word is due to the artistic effect. In the nave the fine candelabra designed by Mr. Penrose and Mr. Pegram have naturally been retained, but with new basin-shaped glasses beneath the lights, which have a good effect and do not clash with the style of the candelabra. Under the dome are hanging chandeliers of bronze, designed by Mr. Somers Clarke, the Architect to the Dean and Chapter. These are very successful; they are graceful in line and at the same time they have the large and massive proportions required in such a building as St. Paul's. In the choir are other hanging chandeliers also designed by Mr. Clarke, having a double system of lights, the lower group in glass globes lighting the lower part of the choir; the upper group, close over these, having the lights concealed in bronze shades opening upwards, so as to throw light on the choir roof while the lights themselves are concealed. These two sets are separately wired, so that either set can be switched on or off independent of the other; and a beautiful effect it was to see first the lower lights only lit, and the bronze scrollwork immediately over them sparkling in the light; then to see these turned off and the upturned lights lit, leaving the lower portion of the choir in darkness and illuminating the mosaic vault and the under-side of the main cornice. This effect is unfortunately not likely to be often seen, but it is so fine and picturesque that it was well worth while to see it for once on this occasion.

The Society of Engineers.

THIS Society, which was founded in 1854 "for the advancement of the science and practice of engineering," naturally includes all branches of the profession, although from the recently published transactions for the year 1900 it might be judged that sanitary engineering formed the chief object in view, for out of eight papers read and discussed no less than six have direct reference to sanitary work. Very likely the fact that the late President is a municipal engineer of many years' standing may have had some influence upon the nature of the papers offered for consideration; and although all of them are worthy of perusal, it seems rather a pity that the proceedings of the year in question were not a little more diversified. Three contributions relate to drainage, two to the kindred subjects of subways for underground pipes and irrigation, and one to investigations for water supplies, while two out of the three vacation visits were to works of a sanitary nature. Two papers of interest to general engineers were read upon the production of metallic bars and tubes under pressure, and the treatment of low-grade iron ores for the smelting furnace. An excellent feature of the volume is the reproduction of discussions upon the various papers, for it nearly always happens that useful light is thrown upon a subject by the comments of those who have come to listen. In the case of the "Society of Engineers," we are pleased to find that the meetings have been attended by many well-known men, whose participation has certainly tended to enhance the interest and value of the proceedings.

Fountain-court, Strand.

IN clearing the ground for an enlargement of the Savoy Hotel and the projected improvements on the adjacent Beaufort buildings site, has been pulled down the west, and remaining, side of Fountain-court, from which the steep flight of steps descended to the precincts of the former Savoy. No. 3, one of the houses that have just been demolished in Fountain-court, was the home during the last seven years of his life of William Blake, who lodged in the back room on the first floor, and died there on August 12, 1827. In that room Blake passed the closing days of his life in working upon his set of plates, for John Linnell, "Inventions to the Book of Job;" and an impression of the frontispiece, with the Creator and Wisdom, of his "Europe, a Prophecy," depicting the vision which, as he said, hovered over his staircase, and for tinting which he was to receive three and a-half guineas. With a final effort he drew a likeness of Katherine Boucher, his wife. Opposite, in the court, stood the Occidental tavern, reputedly more than 270 years old, and latterly known as the Coal-Hole, which, with the two adjoining houses, suddenly collapsed on the morning of Saturday, March 26, 1887, after they had been dismantled for the building of Terry's Theatre. Fountain-court is named after the once famous tavern of that sign in the Strand, the home of the Fountain Club as politically opposed to Walpole. In one of his letters Dennis, the critic, describes a meeting there whereat "after supper we drank Mr. Wycherley's health by the name of Captain Wycherley." Strype cites the Fountain, and

> the alley that leadeth to Fountain-court, a very handsome place, with a freestone pavement and good buildings which are well inhabited.

The Fountain gave place to Ries's Grand Divan, since Simpson's, behind which is Herbert-passage (extending from the court to Beaufort-buildings), which will be absorbed in the rebuilding on the cleared ground.

The Grammar School, Huntingdon.

NEW buildings for the Grammar School are about to be erected upon a site facing the cricket-field after designs prepared by, we gather, Mr. Borissow. The existing school buildings, in the High-street, where Oliver Cromwell had his early education, had been the chapel of St. John's Hospital, which was remodelled and partly rebuilt in 1863, and fifteen years afterwards was restored, under Robert Hutchinson's superintendence, at the charges of the late Dion Boucicault in memory of his son. The chapel had been encased with brick in the middle of the seventeenth century, and at the removal of the brickwork a twelfth-century doorway was discovered; the ground plan showed traces of the north and south aisles of the chapel of the hospital founded and endowed for the relief of poor townsfolk and the support of a free grammar school, *temp.* Stephen, by David, Earl of Huntingdon, afterwards King of Scotland.

The Tower Horse, Leicester.

THE demolition of this old building, octagonal on plan, will shortly be proceeded with for carrying out a widening of the High-street; the outer casing of brick work has been stripped off the shell, which is of stone somewhat roughly worked and laid. An inscription on the tower records that it had been part of a building occupied by Henry third Earl of Huntingdon, in the reign of Queen Elizabeth, and that it had been the lodging of Mary Queen of Scots in 1586, of King James I. in 1612, and of Charles I. in 1642. We may add that the house of the Earls of Huntingdon was known as Lord's Place, and stood in the Swines-market, latterly the High-street, near the East Gates (pulled down in 1774), and that the Earl Henry, who died *s.p.* in 1595, sold the site and buildings of the Augustinian Abbey of St. Mary de Pratis, Leicester, to his younger brother, Sir Edward Hastings, whose

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descendants lived in the borough and county and eventually succeeded to the Earldom of Huntingdon.

Pageantry and the Masque.

MISS MAY MORRIS chose "Pageantry and the Masque" for the subject of her paper read before the Society of Arts on Tuesday evening. We went expecting to hear some suggestive remarks on the approaching Coronation pageant. In this we were disappointed. The only reference to modern pageantry was made to the Lord Mayor's Show, which Miss Morris once witnessed on a rainy day; about this she significantly remarked that the only artistic effect produced by the show were the fire brigades and their equipment. She might have added to this minority the brewer's dray and team. In any case it is obvious that the finest effects of present-day life are found amongst things made for action and usefulness. Their beauty lies in their appropriateness. What will stir the imagination and produce a thrill in the coming processions as much as the brightest uniforms and the most martial music will be the sober-coloured 4·7 gun, manned by the handy man in equally subdued colouring. We do not depreciate Miss May Morris's appeal for colour in modern life. It is a loss we can only deplore. To reproduce the colour of the Middle Ages is as hopeless a task as it is to look for practical artistic results from the money about to be spent for that purpose by borough councils. The public are delighted to hear of art in the abstract, but when it comes to the smallest practical expression they are wholly at sea. Twentieth-century pageantry will be represented, with an impressiveness the like of which history cannot recall, in the coming naval review at Spithead.

Art for Schools Association.

THE Art for Schools Association, which does good work in endeavouring to provide cheap and good pictorial representations for the walls of schools, held its annual meeting at 46, Great Ormond-street on Thursday, when an address was delivered by Sir W. Richmond. Among the specimens of the Association's publications which were hung on the walls of the tea-room was a large and fine black and white picture, a woodcut, "The Plough," drawn specially for the Association by Mr. Strang, who in this instance at least has produced a design which is powerful without being ugly or grotesque. The publications of the Association are grouped into three classes: Historical Subjects, Studies of Natural Objects, and reproductions of Standard Works of Art, or occasionally of drawings made specially for them. The aim of the Association is an admirable one, and we wish it continued success.

Messrs. Doulton's Work.

MESSRS. DOULTON have been holding, at their show-rooms on the Lambeth Embankment, a small exhibition of their most recent works, partly in view of the presence of a good many strangers in London this year. The works exhibited include a large collection of the vases and other articles in stoneware, Doulton ware, and Lambeth Faïence, for the design and make of which the firm has become celebrated; and there are also some exhibits in the class of higher art, the principal being three alto-relief panels by Mr. Tinworth in plain terra-cotta; two large colour panels by Miss E. Thompson "Mermaids" and "Sea-nymphs," and three panels in "vitreous fresco" designed by Mr. A. F. Pearce, and representing three scenes from the life of Sir Galahad. We must confess that we think the best part of the exhibition consists of the works of industrial art, rather than what may be called the fine-art designs. We saw many beautifully designed vases and other such articles, all good in form and fine in colour and execution, and unexceptionable in point of taste; and to say this is to say much, considering what an amount of work of this kind the firm turn out. But Mr. Tinworth's sculpture is what we should call sculpture for the middle classes; with all his undoubted natural talent he has not acquired style in sculpture; he can make his figures tell a story in a dramatic manner, but the result in an artistic sense is rather of the "Bible-picture" class. In the "Mermaids" and "Sea-nymph" panels, again, though the colour effect is decorative, the figures are not good enough to be acceptable as figures; in the Sea-nymph especially the feet are too large and the head too small. It is hardly worth while to do things of this kind unless they are done better than this. There are many people, no doubt, to whom Mr. Tinworth's panels of Biblical subjects will appeal; but they will not be among the best educated class. The operation of "throwing" clay on the wheel was practically illustrated for visitors, and a very pretty sight it is to see the clay vessels growing and taking different shapes from moment to moment under the hand of the artificer.

Messrs. Lawrie's Gallery.

THE new art gallery opened by Messrs. Lawrie, at 159, New Bond-street, forms an important addition to the list of our smaller exhibition galleries; the rooms are well-lighted and approached by a spacious vestibule. The opening exhibition promises well for the future, for it consists of a collection of works by Turner, known as the Farnley Hall Collection, many of which are little known. They are nearly all, or perhaps all, early Turners; the large picture of "Dort" (one of the only three oil pictures in the collection), calm water and craft motionless on it, almost suggests Callcott in colour and style, though there is something Turneresque in the arrangement of the composition. Among the water colours are some exceedingly good examples of Turner's earlier manner in landscape; among the finest are "The Source of the Arveron" (9) and the often-painted "Devil's Bridge" on the St. Gothard. Among the Rhine series the "View of Venice, with the Rialto" (28) is a good example of Turner's care in drawing architecture in his earlier days. "Bolton Abbey" and "Bonneville" (34 and 36) are two fine pictures; and "A First-rate Taking in Stores" (29) illustrates afresh Turner's love for the old bulky wooden men-of-war; the foreshortened drawing here of a three-decker, with her massive bow and cutwater (or whatever the erections on each side of the bowsprit were called), gives the modern spectator a vivid conception of the picturesque element in the old line-of-battle ship. "Scarborough" (34) one of the largest works exhibited—a very large one for a water-colour—is remarkable both for its splendid atmosphere and colour, as far as the colour goes, and as an illustration of the limitations either of the palette, in those days, or of the ideas as to local colour. The wooden posts in the foreground, for instance (part of an old groyne), would not nowadays be painted nearly the same colour as the sand, which they certainly cannot have been; nor would Turner have so painted them in his later days. But that kind of treatment, found also often in De Wint, was "breadth"; a quality which it must be admitted the modern passion for local colour has rather made shipwreck of. The "Scarborough" is an excellent example of the best achievement of the era of the brown water-colour school. The "Farnley Hall Sketches," and the "Sketches on the Farnley Property" are of rather unequal interest; in the drawing of the interior staircase, by the way, the columns must certainly be too thin in proportion. But there are seventeen studies of birds or birds' plumage, which are admirable, and show with zeal and industry Turner went into that study of detail which enabled him, even when painting on a small scale, to touch in his birds and plants in a truthful manner. It is a pity that he did not bestow equal care on the study of the human figure, in which he never succeeded, as various works in this collection exemplify.

The Fine-Art Society.

AT the Fine-Art Society's Gallery is a collection of water-colour drawings by Mr. Mortimer Menpes, under the title "The World's Children;" a title rather too extensive, since by far the larger proportion of the subjects are English. Mr. Menpes is a very clever artist in certain ways, but it is certainly not his mission to paint the child. We have seldom seen pictures of children more devoid of beauty either of face or manner than most of these; the curious thing is that the artist has not even caught the characteristics of child physiognomy; most of his girl children, if you hold your catalogue in front of the figure so as to screen all but the head, have the faces of grown-up women; no one would ever suppose them to be children. "Good Night" (54) is about the one exception among the English children; the solemn little Chinese and Japanese children in Nos. 46 and 58 are good and characteristic; but as a whole the collection is most disappointing. We could hardly have believed that a collection of pictures of children could have been made so unattractive and uninteresting.

Shop Architecture.

JUDGING from an illustrated trade card which has been forwarded to us, there seems to be a new branch of the architectural profession arising, under the style of "architects and shop-engineers." The card in question gives a view of a very large commercial establishment in Reading, and the business of the "architect and shop-engineer" appears to be to carry three upper stories, tumultuous with gables, projecting bays, and turrets, upon two continuous stories of plate glass without a break except for the doors. The effect from an architectural point of view is something beyond criticism.

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THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday night at the rooms of the Institute, 9, Conduit-street, the President, Mr. W. Emerson, in the chair.

Mr. Graham announced the decease of Mr. H. D. Shepard, an associate, elected in 1867. The deceased gentleman won the Institute medal for essays in 1869.

The Plan of the House in Relation to the Garden.

Mr. T. H. Mawson then read a paper on "The Unity of the House and Garden," of which the following is an abstract :—

Mr. Mawson explained that his paper bore entirely upon the country house, and although his remarks would in general be true to the title and be concentrated chiefly upon the union of the house and garden, he purposed to dig deeper and examine the foundation upon which every successful scheme of habitation must necessarily rest. Every truly pleasant, healthy, successful abode must rest upon considerations deeper than stones or bricks and mortar, trees and flowers. At no time, if the scheme is to be successful, can the house and the garden be divorced from the surroundings; all must be viewed together in unity.

Where there is perfect freedom of choice, the three great considerations in deciding upon the site and position of a house are : climatic conditions—*i.e.*, whether the pervading character of the air is humid or dry; the nature of the subsoil, whether sandy, gravelly, or clay; and the aspect—for no matter what the prospect offers, it is unwise to build upon the north or north-west or north-east side of a hill or knoll. The nature of the subsoil is a point needing more than ordinary caution; not only the site of the house itself, but the immediate surroundings, should be tested. For health, beauty, luxuriance, and ultimate cheapness, select a site with an under-stratum of gravel or marl, and a good surface-covering of loam.

The first great question to be decided is: Are purely artificial considerations to be all-sufficient; or are the artificial considerations to hang upon, and be guided by, the larger aspect fixed and abiding? The pure, healthy mind recognises that those who have built well and lastingly have been willing to make mere personal display and selfish interests subservient to and harmonise with their chosen surroundings. Such a mind espouses local customs in building and local material, and indigenous trees and shrubs and acclimatised flowers in gardening, making them the characteristic keynote.

The architect and garden designer must realise that the *home* is the precious thing, and not the house; that their part is to give to the endearments and necessities of home a suitable expression and dress; their efforts must be concentrated upon the scenic part of the play, true, real, and human, to be enacted therein. The needs of the proprietor should be clothed with a character to accord with the surroundings and expressive of his status. The impressions and inspirations of the spot should guide the architect and the garden designer both in respect to the preparations of the plans and also of the elevations and of the garden scheme. Given a house designed as a thing by itself without reference to its fixed, unalterable surroundings, the garden designer has a well-nigh impossible task imposed on him.

In the absence of the skilled designer, where the laying out of the garden is entrusted to the local nurseryman, the unity of the house and garden may still be secured, for it is open to the architect to suggest in the most unmistakable manner by his plan of the house, the general laying out of that portion of the site which most nearly concerns the architecture. The author illustrated this point by reference to two alternative sets of plans arranged for the same site, it being shown that the approved plan, with a little help from the elevations, had determined the larger part of the immediate surroundings of the house. Other actual examples were cited, and the plan and general arrangements described by the author, to show how easy it is to make the happy combination of house and garden impossible.

Seldom when a plan of a country house is given do we find any indication of the compass points thereon. This consideration deserves more importance than it receives. Its absence suggests the idea that convenience and skilful planning is everything, and aspect secondary or nothing.

The author brought the several considerations dealt with in his paper to a head by describing his plan and treatment of gardens on the top of Flagstaff Hill, Colwyn Bay—a site including within its twenty acres almost every difficulty with which the garden-maker could have to deal. The site commands an extensive panorama of sea and landscape scenery, and the proprietor wished the house so placed and planned that he should not only obtain the best views from each room, but also that he should have the best aspect (a great difficulty considering the direction of views), ensuring the rooms being as sunny as possible and securely protected from the wind, and be able to find a sheltered walk on which to promenade from whichever direction it might blow. The author exhibited plans showing how the first conditions were met, all the entertaining rooms excepting the morning-room, which only obtains the morning sun for a very short time, and the billiard-room, on which the sun falls a little after midday, complying. The condition as to protection from the wind was the most difficult to meet. The two prevailing winds are from slightly south to west and east to north. The stables, lodges, cowsheds, and kitchen wing made an ample protection from the first, but the second could only be partially guarded against. The curved drive was well protected, the ground between the walk and the kitchen garden having been raised 14 ft. or 15 ft., and planted with maritime pines, Scotch firs, and evergreen oaks. The latter will in years to come give the best possible protection, without growing so high as to obstruct the view from the house. In its original state there was an entire absence of shelter, but the author's treatment resulted in a garden as sheltered as it was sunny, and as shady as any in the valley below.

In the next plan the main and lower terrace and fountain garden came naturally in front of the entertaining rooms, and the tennis lawn on the west; the kitchen garden, generally the most perfect part of all, was in direct communication with the terrace. There within the high walls could be found shelter from the winds; here one could pluck the earliest flower and the last rose of summer, the most delicious strawberry and the most luscious plum.

A country house and garden is impossible without an orchard; one cannot think of an orchard without realising how beauty waits on use. Preferably its position should be near the kitchen garden. Plant regularly in straight rows; do not mix cherries and apples, pears and plums too much, but try to obtain effect by grouping each together. The orchard, however, is by no means the end of the garden. Away in the hollow is the lake, margined with water-hawthorn and water-lilies. On its banks are knolls of oak and masses of rhododendron, interspersed with wild gardens and glades of grass.

In conclusion, the author observed that he had referred specially to neither the formal nor the landscape school; there was work in plenty for both; the help of both was needed. If we could divest ourselves of some of the prejudices called schools, and devote our energies to earnest and unstinting study, and apply that study to the perfection of our craft, and if we could allow our professional jealousies to give place to a spirit of mutual helpfulness, we might yet do something to advance the peaceful arts of our country.

Mr. Milner, in proposing a hearty vote of thanks to the reader of the paper, said he had had the opportunity of looking through the paper that afternoon, and he must congratulate Mr. Mawson on the goodness of his opinion on landscape gardening. He agreed that architects and garden designers should work together in harmony, but he would add that the architect should have the prevailing view with respect to the treatment next to the house, so that he might be assured that that part might have a continuation of the character of it. The architect should have the plan of the whole laying out submitted to him. It was most important that the garden designer should be able to realise his picture finished. In passing he would advise architects to give their houses more base. He did not agree with Mr. Mawson as to working up to a house, but away from it.

Mr. W. G. Wilson, in seconding the motion, said he had listened to the paper with very much interest. It had been their fortune in listening to papers by gentlemen not members of their own profession to be hauled somewhat over the coals, and they had been hauled somewhat that night. He must say that in the designing of a house it had never been his failing, and he knew of no architect of any repute whatever who would fail first of all to consider the points of the compass in designing a house. He did not think that any architect of any capacity whatever would forget the points of the compass in designing a country house. But he had had the difficulty forced upon him with regard to designing gardens which Mr. Mawson had raised that night, and he was bound to say that on his part, and probably on the part of every architect who had designed a country house, the difficulty had not emanated from the architect, but from the gardener who had been called in to advise with regard to laying out the garden. He thought that any architect who designed a house was most wishful not only that the best points of his house should be emphasised and viewed from the gardens, but that the view of the surrounding country from the house should be led up to by the foreground. Therefore, he felt that Mr. Mawson had made rather an uncalled for charge—a charge which had been made against them by gentlemen connected with other arts besides that of gardening. There was one little point he wished to make. Mr. Mawson had spoken out that night, and they had heard what he said, but as a matter of fact the members present rarely heard the papers which were read from the desk. He did not know whether that could be remedied. He had listened with intense interest to the paper, more especially as in a house which he had designed near Liverpool the question of the garden came in. The house was situated in what they might call a rustic position, and one would suppose that the best treatment would be what they called formal gardens, but over and beyond the site of the house there was a far distant view of the Welsh Hills, and the proprietor pointed out to him that a formal garden was quite unsuited for the position, and that instead of the garden being a formal garden which would be a sort of complement to the house, it ought to be a foreground one from the windows of the house, and he insisted on having rockeries and other things laid up to this far distant view of the Welsh mountains. He would like to know whether the landscape garden was the proper thing or the formal garden. Mr. Mawson's paper was an excellent one, and his language in many places was beautiful, but he did not think it quite fair to the profession to show plans of a large and important house, apparently with the whole of the entertaining rooms facing due west and the kitchen and other offices facing south. He fancied that must be unique and was not a difficulty which Mr. Mawson would be likely to have to overcome very often. He would be glad to hear his advice with respect to the house he had mentioned as to whether it should have been a formal garden, or whether he would hold that the view from the house should have been considered, and the garden made a stepping-stone to the scene beyond.

Mr. Lorimer said he had listened with great pleasure to the paper, and he entirely endorsed the view as to the great importance of aspect in laying out gardens. He did not think that the plan given showing the kitchen and scullery facing due south was by any means an unique example. He had seen many houses where the architect seemed to have got into his head the type of elevations he wished to put, and had fitted in his plan to assist this elevation, and had made the kitchen and other offices face not only due south, but entirely overlooking the garden. In his small experience he had found that clients were generally very keen about their servants not overlooking the garden. He thought on going to a site first, the architect should carefully consider the blocks of his house; where his kitchen block ought to be situated, and the direction in which it should look, and where the more business part of the house should face. The method of approach to the house was also of the utmost importance, and at all events in Scotland, where they had to nurse every ray of sun they could possibly get, the approach was always, if possible, in the north, and all their living rooms were to the south and the west. With regard to the question of treatment re-

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ferred to by the last speaker, he thought that to a large extent was a matter of instinct. He thought when the architect got on the site his instinct told him more or less whether a formal treatment or a natural treatment was the one to be used for the particular plan, and he did not see that any hard and fast rule could be laid down on that matter. Each piece of work given to the architect had to be looked at from its own standpoint. The architect, he thought, also should consider the surroundings of the house—the lay-out of the house. Unfortunately, most architects lived in towns, and not in the country, and he thought it was only the architect who had lived a great deal in the country who could lay out a garden. The ideal connexion was when the architect mapped out the whole scheme, and then called in some sympathetic man like Mr. Mawson, who could give instructions as to the planting and that kind of thing, of which no architect could possibly have a thorough knowledge—he meant a nurseryman's knowledge.

Mr. Leonard Stokes said he was not an expert in gardening, but he would like to say a word on the point of aspect being everything. They had to consider the site, and if they had a site which, if the living rooms faced south, would mean looking into a bank, he thought the client would not thank them. Their client might have a pretty view facing north which he wished to face. He had had a client of that sort to deal with, and had been obliged to put the drawing-room facing north. With regard to the plan shown by Mr. Mawson where the entertaining rooms faced the west, he would point out that in this case the sea was to the west, and the client probably insisted on having the living rooms facing the sea—very naturally, he thought, although not very ideal from the aspect point of view. But the architect had no power. If the client insisted on having the living rooms facing the west it was just possible, although it was not exactly conceivable, that there may have been some reasons for putting the kitchens facing south. It was not ideal, but it was very difficult to lay down hard-and-fast rules that the living rooms must face the south, and the kitchens must face the north, and those sort of rules. They were very nice, but when they came to meet special cases they had to treat them in a special way. He might as well confess the whole thing. He had a drawing-room at the north and a kitchen at the south, but he had tried to prevent the sun coming into the kitchen and to get the sun into the drawing-room. It was only by using a little ingenuity in the treatment of special cases that they could get over special difficulties. If they tried to follow the law set out in text-books they were very apt to find themselves up a tree. They must allow the client to have his pretty view or they would probably not get the job. Although he argued in principle that they must get the sun into the living rooms, yet they must not necessarily condemn the architect who put the drawing-room facing the sea and the kitchen in the south. Clients were obstinate people, and sometimes architects were driven to do things they objected to.

Mr. E. W. Hudson said he would like to know how Mr. Stokes had got the sun in the north aspect. If he could only do that in some of the slums in London it would be a fortune to him and a great many others. He had listened with great pleasure to the paper and supported the vote of thanks. He supposed in past centuries when those palatial residences were put up, such as Waverley Abbey, it was the custom to poise the building on a very large basement, by which the reception rooms got a view over a small hillock. Mr. Mawson had given them both poetry and practice, and although his example had been confined mostly, he took it from modern buildings it would be most interesting if they could at some time have some views of the old gardens. Mr. Mawson had mentioned one—Haddon Hall, but there were others they could think of, such as Hampton Court and Waverley Abbey, where they found the orchard placed quite close to the kitchen-garden. He thought those old gentlemen knew pretty well what were the best arrangements for obtaining the fruits of the earth and every necessity for a goodly life.

Mr. H. I. Triggs remarked that in studying old gardens he had found very often that the time of the house was quite neglected in the garden. With regard to the plan shown by Mr. Mawson, he thought the lecturer's point was that if the house had been put a little further back it would have enabled a very good garden to have been got in the south side which they omitted to put.

The motion having been carried,

Mr. Mawson in reply said that Mr. Milner evidently overlooked one passage which he read very carefully. When he spoke of working towards the house and from the house he did not mean it in the sense that they should start laying out the garden in the park and finish in the house, or start building their terraces before they laid out the others. It had nothing whatever to do with that question. What he tried to show was that in designing they should work from the larger and finish with the detail. Coming to Mr. Wilson's remarks, he was sorry he could not quite agree with him that architects paid enough attention to the aspect. He happened to live in the Lake District, and he had given one example on the south coast which several speakers had referred to, for a particular reason. He pointed out to them that the views were to the west, but everything there was given up for the sake of the view. Now, he maintained that it would have been quite possible to have had peeps and glimpses of the sea and still retain the whole of the aspect, which was so desirable in that case. In his own district nearly the whole of their views for the Windermere side were from the west or to the north. People building said they must have these views, and that they did not care anything about the aspect. Where it was the intention to occupy the house for only three months of the year, June, July, and August, he thought that was a quite right and proper view to take, but when they had to live in the house the whole of the twelve months, he thought it was a wrong one. In no case had he referred to the architect's name, and in all the cases he had referred to, the matter was fixed by the client and not by the architect, but if he had to advise the client, he should say that, irrespective of all other considerations, aspect was the most important. They could always get the view when they wanted it, but if they built away from the aspect it was very difficult to obtain it. With regard to the question which had been put to him, he had purposely kept clear of details. He simply had tried to take them to what he considered the source of inspiration was, that their plans and conceptions of what should be, should be the outcome of site and local conditions and local materials with which they had to deal. He hoped he made that point quite clear. He would try to show by a view of his own house and of a little house designed by Mr. Gibson for his brother, exactly what he thought about the one question Mr. Wilson put to him, viz., what would be the right and proper thing to do if they had an exceptionally fine view from their house. [Views of the houses were given.] He thought it infinitely better to see a fine natural landscape over a naturally-built terrace wall, than to see the same over a lot of undulations. He was particularly interested with what Mr. Lorimer had to say about gardens, and he had done so many charming gardens that anything from him was of particular value. Now Mr. Lorimer had done exactly what he said he hoped some of them would do—that was tried to design the gardens round the house. When they came to consider that only about one out of twenty gardens laid out in the country had had any professional skill extended to it, surely there was plenty for everyone of them to do. Referring to Mr. Stokes he might say he had tried to avoid fixing principles. Of course, he had to give examples, for it was absolutely necessary to emphasise the point he wished to make, but what he wanted them to do was to go to the spot and simply do what the local circumstances suggested they should do. That to his mind was the right way to begin to plan the garden.

The Next Meeting.

The President announced that the next meeting would be held on June 9, to receive the report of the scrutineers as to the results of the annual election; to elect candidates for membership, and to consider some alterations in the Institute paper, "Suggestions for the Conduct of Architectural Competitions."

CEMENT IN RUSSIA.—The aggregate producing capacity of the three Russian cement factories at Novorossisk is, according to a consular report just to hand, 296,000 tons per annum. The output last year, however, was only 120,000 tons, of which 65,000 tons were shipped to the Far East.

ARCHITECTURAL ASSOCIATION SUMMER VISITS:

CHRIST'S HOSPITAL, HORSHAM.

THE interest which always attaches to any of Mr. Aston Webb's work, combined with a real summer day at last, had the effect of inducing a large number of members to face the delays of the London, Brighton, and South Coast Railway, and more than 100 assembled at Victoria on Saturday at 1.30. Unfortunately, it was nearly 4 o'clock before West Horsham was reached, and as the time of the return train was 5.55, the visit resolved itself into a somewhat bewildering rush round the magnificently-arranged new school-buildings. The Association was fortunate in that both Mr. Webb and Mr. Bell were able to be present, and those who were able to keep up with Mr. Webb heard a great deal that was both interesting and instructive.

After a run through the laundry buildings, members collected in the great hall where Mr. Webb gave a terse description of the aims and requirements of the school, illustrated by the original competition block plan and a smaller scale plan showing how slightly the actual buildings have varied from the architects' first conception. The old idea of closed-in quadrangles was, Mr. Webb explained, entirely discarded in favour of a scheme which would admit of the utmost advantage being taken of light and air, and thus the eight boarding-houses are strung out in a flat segment of a circle on either side of the great quadrangular block of school buildings proper, the base of which is formed by the great dining-hall and head-master's house, with the kitchen and offices behind, and the sides and end by the science school, school hall, classrooms, and chapel.

Each boarding house block contains two houses of fifty boys each, with the exception of the preparatory block which contains 120. The total number of boys being 820.

What may be termed the salient feature of the scheme is that the feeding arrangements are entirely centralised, and thus masters, boys, and servants all come three times a day to a central point for meals—masters and boys to the great hall and servants to other rooms adjacent to the kitchen. This decision on the part of the school authorities has been most ingeniously carried out by the architects, and the complete separation of boys and servants has been contrived first by the admirable plan of the dual system of the boarding houses, and secondly, by a subway which connects the whole range of buildings and which is used exclusively by servants, who thus never have occasion to mix with the boys at all.

That this food centralisation has largely determined the plan is obvious, and it will be very interesting to see if it will have the success it deserves. The feeding of 900 people at the same time is no small undertaking, but the economy and convenience effected must certainly be great, and the quantity and quality of food being alike for all will have many advantages over our antiquated Public School system of separate, and in many cases scattered, houses, where the management may or may not be good. There are, too, no "sick rooms," but directly a boy is unwell from any cause he is at once isolated, and sent to the infirmary—a method which might well be more generally copied.

The drainage is disposed of on the septic tank system, the installation being one of the best and most perfect hitherto carried out. The effluent is sent through land sloping away from the tanks, and after being thus additionally purified finds its way into the brook below the declivity of the ground.

Some of the old buildings of the Aylesbury Dairy Co. which were on the land have been retained and utilised, and more especially two old cow byres of great extent have been adapted for swimming-bath and gymnasium respectively, the old centre posts having been removed and the tie-beams strengthened. The gymnasium is not yet installed, but the two swimming baths, 88 ft. by 25 ft. for the older boys, and 33 ft. by 25 ft. for the younger ones, are complete.

A good and plentiful supply of water has been obtained from a well some 480 ft. deep, the water being pumped to a reservoir on the top of Sharpenhurst Hill, where a fortnight's supply of 300,000 gallons can be stored. The water comes thence by gravitation to tanks containing two days' supply.

Lighting is by electricity, three dynamos being provided.

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The heating is by steam, all the mains being carried along the subway, but each block is separated, and thus under easy and independent control.

There are three boilers, two of which will always be in use. Messrs. Clements Jeakes have carried out the heating, which is, Mr. Webb said, entirely satisfactory.

Mr. Webb generously declared that many brains have been at work to produce the complete buildings, and said that each and all had given ready help and assistance, and especially Messrs. Longley, of Crawley, the builders; Mr. Proudfoot, the clerk of works; Mr. Tingley, the foreman; Messrs. Masey, who carried out the electric lighting; Professor Robinson, the water; and Messrs. Hellyer, who were responsible for all the plumbing work.

The great hall is a fine room, and the old associations of the school have been well kept up by the oil-paintings, glass coat of arms, and the pulpit, all of which have been carefully removed to Horsham. The roof is of Oregon pine, the walls being panelled up to a certain height, with plain red brick above. The in-and-out plan of the side walls has been so treated as to give the windows internally a great depth of reveal, which very much adds to the appearance of solidity and mass in the interior. From the great hall we hurried rapidly through the kitchen to the art school, passing the old Grecian gateway with its appropriate motto, "Fear God, Honour the King," which has been well worked in with the new work of the cloisters. The art school is a delightful room with a barrel-vaulted plaster ceiling and well lighted from the north. The science school fittings were not yet fixed, so a cursory glance had to suffice, and but a few moments more could be spared to the library with its open timber roof, Holbein painting, and a fine mantelpiece, the latter being the gift of the architects to the school. A classroom was next inspected, and then the old brick entrance from Newgate-street, which has been cut out in sections and refixed at the south end of the school hall, at the end of the great quad with the classroom buildings on either side. This hall will seat 1,000 people. The walls have a panelled dado with the plain brick above, and a fine Oregon pine open-timber roof. The old organ has been repaired and refixed here. A gallery at the north end is connected by means of bridges with the first floor of the corridors leading to the class-rooms, and ample provision has been made on the ground floor for the rapid clearance of boys from the hall. At the north end the old statues of James I. and Charles II. have been placed.

The chapel, on the west side of the quad, was still in a very unfinished state, but will, when completed, have oak panelling and an open timber roof. The fine stone reredos, carved by Mr. Frith, and the large window above, designed by Mr. Spence, are the gifts of old Blues, as also is the organ, which will be a divided one, placed on either side of the altar.

Perhaps as regards planning the boarding houses formed the most interesting feature of the afternoon. For many reasons a boys' boarding house is not an easy subject, and certainly those at Horsham are worth study. No single point seems to have been overlooked, and they are models of economical and hygienic planning, and if the traditional Spartan element of the school is somewhat in evidence, so much the better for the rising generation.

By this time it was after 5 o'clock, and what little time remained was occupied by photographing the group of members and despatching the most excellent and very welcome tea so kindly provided by Mr. and Mrs. Webb.

After a hearty vote of thanks had been proposed by the President, Mr. Seth-Smith, a hasty dash was made for the return train.

The whole time spent at the school was so inadequate for careful study that it is a little hard to give more than impressions.

Want of funds have clearly had the effect of eliminating all unnecessary ornament, but in essentials absolutely nothing seems wanting, and when the staring effect which all new work seems to have has worn off, and the hard contrasts of the Cranleigh bricks and Monks Park stone have toned down, the whole range of buildings will form a most harmonious and characteristic school group.

The question of secondary education is a large subject, but there can be little doubt that, at least as far as health and wholesome external impressions are concerned, the new Christ's Hospital has great advantages over most of our public schools, and the fearless departure from ancient and time-worn custom should do something towards a more general scientific treatment of twentieth-century school life.

The following is a list, furnished by the architects, of those who assisted in the carrying out of the buildings:—

The quantities were prepared and estimates arranged by Messrs. Hunt & Steward.

The preparation of site, formation of roads and plantations, &c., were under the superintendence of Mr. H. E. Milner.

The electric light installation and steam plant were designed by Messrs. Massey & Allpress.

The deep well pumping machinery, reservoir and fire mains were designed by Professor Robinson.

The general contractors for the whole buildings were Messrs. Longley & Co., of Crawley, Sussex.

The sub-contractors were:—For the hot-water heating, Clements, Jeakes, & Co.; laundry fittings, Summerscales & Co.; science school fittings, the Bennett Furnishing Co.; chapel seating, Hammer & Co.; internal plumbing, Dent & Hellyer; electric light wiring, Strode & Co.; electric light fittings, Strode & Co., and Elsley; service lifts, W. G. Johnson; grates and mantels, Shuffrey & Co.; sundry ironwork, Yates, Haywood, & Co.; glazing, G. Farmiloe & Co.; casements generally, Wenham & Waters.

The sculpture has been mainly the work of Mr. W. S. Frith, certain other portions having been carried out by Messrs. Daymond & Son and by Messrs. Fagan & Bell; and the stained glass has been entrusted to Mr. Spence, the new organ to Mr. Kirkland, and the inlaid altar table to Messrs. Norman & Burt. Mr. Proudfoot has been the clerk of works and Mr. Tingley the contractors' general foreman from the commencement of the works.

A more lengthened and leisurely visit on another day enables us to confirm the general impression obtained in the course of the unfortunately hurried visit of the Architectural Association. It would have been quite worth while for the Association to have departed from its usual hours and devoted a whole day to the visit by starting in the morning instead of the afternoon; perhaps those who arrange the excursions were not fully aware what an extended range of buildings they had to see; but there is so much for young architects to learn from a building of this kind carried out in a practical manner. We may congratulate the architects on the successful completion of one of the most important groups of school buildings ever erected in this country, and one which we think justifies the remark that we made on the first sight of the competition plan, that it started a new era in the planning of large schools.

THE HOME ARTS AND INDUSTRIES EXHIBITION.

THE eighteenth annual exhibition of the Home Arts and Industries Association is now being held in the gallery of the Royal Albert Hall. The exhibition is always an interesting one, and in some respects it shows more successful work than previously. The Compton School exhibits terra-cotta of very exceptional merit—sundials to be built into the wall; bowls, in the form of window boxes, for containing plants, daintily modelled with figures and conventional foliage; a huge terra-cotta vase, octagonal in form, each side made in a separate piece, the whole bound together with iron bands, which form a feature of the design. The most striking exhibit of this class and, indeed, of the whole exhibition is a group of four large panels in gesso, segmental in section, that eventually will adorn apsidal walls of the memorial chapel at Compton. Like the rest of the chapel, they are from the designs of Mrs. G. F. Watts, who is also responsible for the colouring; each panel contains three figures, life size, enwrapped by wings of wondrous colour; the modelling is the lowest relief, with very sharp contours, and the decoration is imaginative and allegorical to the last degree. Two of the panels are the work of students of the Godalming School of Art and two are by the Compton village carpenter. The Haslemere industries maintain their reputation by most interesting and well-conceived work; the woollen rugs from the designs of Mr. Godfrey Blount are very attractive, and should be in great demand; every one has experienced the difficulty of obtaining suitable rugs at a reasonable price. A weaver is to be seen in the gallery at work at the loom. A hanging in linen appliqué of two figures bearing an enormous bunch of grapes, and surrounded and enclosed by the foliage of the vine, is fine in colour and admirable in execution. While speaking of this class of work, we must mention the tapestry and silk damask made by the cripple girls at Bushey. These girls are unable to earn their living in other ways, and they are being taught to be more than useful; they are executing work so excellent in colour, design, and workmanship, that it must rank high in this beautiful art, and we are glad to learn it fetches appropriate prices. Most of the exhibits are wall hangings and mats.

Amongst the metal work a beaten copper chimney-breast decoration, from the designs of Captain H. Montgomery, is distinguished by the vigour and simplicity of its design and execution; a fine plate by the same artist is also worthy of notice. Good beaten metal-work comes also from Fickleford and Keswick. There is no furniture to be seen of any importance; in woodwork, the best things that are done are in inlay; a row of baby girls inlaid on the front of a teak chest is excellent, this comes from Escrick. Very clever work in this section comes from Bolton-on-Swale, though the cabinets, &c., which it adorns are inferior in design and workmanship.

Space will not allow us to mention the many other sections and exhibits of interest; there are very many that are of no interest whatever, but we have preferred to call attention to the real excellencies of the work done by the Association than to find fault with mistaken endeavours. We heartily sympathise with the objects of the movement; its influence cannot be too widely felt; to encourage, and, where necessary, direct industries that might otherwise become swamped by the competition of cheap and machine-manufactured goods of the same class means a livelihood to some who would otherwise be obliged to risk unhealthy work in cities, and gives pleasure and satisfaction to a large public.

EXHIBITION OF AUSTRIAN DECORATIVE ART.

THE exhibition of Austrian art now open at the Prince's Skating Club, Knightsbridge, is to be welcomed, because it creates a precedent which it is to be hoped may be followed up from time to time by similar exhibitions from other countries.

Decorative art attracts a good deal of attention, and this exhibition of Austrian work is likely to be popular and should be visited by all persons interested in handicrafts. Not only does the exchange of ideas do good service, but the strengthening of convictions by which work is carried through is best achieved by seeing as many sides as possible of an art while practising it. It is difficult, of course, to get rid of insular prejudice in judging of the handicrafts of other countries; the familiar styles and methods of making useful things which we have been accustomed to from childhood cling to the mind. Perhaps in furniture design this prejudice is more permissible than in many other national characteristics. The English furniture makers of the best periods understood their business thoroughly, and their work is still the criterion of excellence of design and workmanship; immense prices are being paid for examples at the present day, not we believe because it is a fashionable fad to have old furniture, but because a very large section of the public find it impossible to buy new furniture of distinction or taste. During the Victorian era the tradition amongst furniture makers was nearly wiped out; happily there is a prospect of that tradition assuming its proper place, and with very good reason. The masters of English furniture making of the sixteenth, seventeenth, and eighteenth centuries understood very much better than we do now—and we are inclined to think better than the continental masters did—the permanent value of restraint in design. Such a thing as novelty was not sought after. There are not many ways of doing a thing well, and those who clung closest to the best traditions of their ancestors were the men who created the succeeding styles which met the needs of new generations.

We believe that much of the work at the Austrian Exhibition is an honest endeavour to meet modern conditions of trade and public demand. There is very much of the "art Nouveau" style in evidence, and the best exhibits show an uncertainty of design and purpose that is not convincing. The exhibit that stands first in our opinion is the side of a room in Austrian oak, the central feature of which is a fine

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chimney breast treated with an Ionic order and a broken pediment. This is the work of Messrs. Höfler, from the design of Mr. J. J. Joass. Most of Messrs. Höfler's work is in solid Austrian oak treated on sensible and quiet lines. A bedroom is shown by Mr. Anton Pospiochil, the furniture being in oak veneered with Austrian ash polished. The effect is very clean and attractive, although the design is unnoticeable either for good or bad qualities. The best complete room is a drawing-room by Sigmund Járay, in the Empire style as it existed in Austria at the end of the eighteenth century. The room is furnished with taste, and the furniture in some brown wood, ebony turnings and gilt ornaments, is very handsome. A smoking-room for a hunting lodge of rather substantial design, by Julius and Josef Herrmann, is of a distinctive character; there is a feeling of very big game about it, and it is not unsuitable for its purpose. The sculpture and modelled work does not show any very serious endeavour beyond that of attempting to please at first sight, much of it being very florid and decadent in style. The Cloisonné work is interesting and much more beautiful, the lustres being particularly fine. Ironwork is represented by Julius Endlweber, by excellent workmanship treated in a somewhat too naturalistic manner.

COMPETITIONS.

WORKMEN'S HOUSES, COLERAINE.—In the competition for the erection of twenty-five workmen's houses at Coleraine the first premium has been awarded to Mr. Maxwell Given, architect, Coleraine, and the second to Mr. Jas. A. McCormick, of the same town.

LEIGH INFIRMARY.—Mr. Alexander Graham, F.R.I.B.A., the assessor appointed by the President of the Royal Institute of British Architects to adjudicate on the plans submitted in competition for an infirmary at Leigh, has made his award as follows: No. 1 in order of merit—Design No. 51, Scheme 2 (Mr. J. C. Prestwich, Leigh, Lancashire); No. 2, Design No. 27 (Messrs. Harry W. Pye and Roger F. Bacon, 16, John-street, Bedford-row, London); No. 3, Design No. 3 (Messrs. F. A. Buttery and T. B. Birds, Exchange-buildings, Queen-street, Morley). Fifty-two sets of drawings were submitted.

THE SURVEYORS' INSTITUTION:

ANNUAL MEETING.

THE annual general meeting of the Surveyors' Institution was held on Monday at Great George-street, Westminster, when the chair was occupied by Sir J. F. L. Rolleston, M.P., the retiring President. The attendance included Messrs. A. Vernon, A. R. Stenning, G. Langridge, W. E. Horne, W. E. Woolley, A. Savill, Norman Garrard, L. R. Vigers, T. Blashill, the Hon. E. G. Strutt, and J. W. Penfold.

The members of the Council were re-elected, with the addition of Mr. J. D. G. Drew.

The thirty-fourth annual report of the Council showed that the membership of the Institution had maintained its annual rate of increase. The total membership was now 3,312, as against 3,200 last year. The loss in the class of Fellows by death or resignation had been forty-eight, against which there had been forty-seven transfers from the class of Professional Associates and nine elections to the class—a net gain of eight. The class of Professional Associates had been increased by 155 elections, but against this must be set forty-seven transfers to the Fellowship and thirty-six deductions on account of death or cessor of membership. During the year 147 new students were enrolled, while sixty-three ceased to be students by efflux ion of time, and fifty-six were elected to the Professional Associateship. The total of 360 candidates who sat for the Professional examination included thirty-nine who in a previous year failed to satisfy the examiners in their "typical subject." Of these re-examined candidates, thirty-one presented themselves in the "Valuation" subdivision, of whom twenty-seven passed. Of the eight who came up in the "Building" subdivision, four passed. The number of candidates who this year obtained the necessary pass marks in the whole examination, but were "referred back" in their studies in the "typical" subject, was in the "Valuation" subdivision fourteen, and in the "Building" subdivision eight. The report passed on to the question of Scottish examinations. It was satisfactory to note that the examination system was steadily taking root in Scotland—a result largely due to the strenuous exertions of Mr. W. Fraser, the local hon. secretary, and the Chairman and members of the Scottish Committee. Five candidates presented themselves—three for the Associateship and two for the Fellowship examination. Of the former, all passed; of the latter, one passed and one failed. There were seven candidates this year for the examinations in Dublin—four for the Associateship and three for the Fellowship. All the Fellowship candidates and three of the Associateship candidates passed their examination.

The "Institution" prize of the value of 15 guineas was awarded to Edmond Meacher, a "Land Agency" candidate in Division II., who headed the list with 738 marks out of a possible 1,000. The "Special" prize of the value of 10 guineas was gained by Bertram Alfred Boyton, a candidate in the "Valuation" subdivision, who obtained 722 out of a possible 1,000 marks. The "Penfold" gold medal was won by Martin Lowish Wheldon, a "Land Agency" candidate in Division IV., who headed the list with 826 out of 1,000 marks, to whom was also awarded the "Crawter" prize for the best work on the subject of valuation. The "Penfold" silver medal, as well as the "Driver" prize of the value of 15*l.*, was awarded to John Turner Clough Hazledine, who in the "Land Agency" sub-division obtained the highest proportionate number of marks among both classes of candidates for the Professional Associateship. The "Beadel" prize, offered this year for the first time, was awarded in connexion with the subject "Agriculture" to Arthur Ward Ashten. The "Preliminary" prize, awarded to the candidate passing at the head of the list in the Studentship examination, was won by Alfred Armstrong Hart, who obtained 454 marks out of a possible 500. The Daniel Watney prize of 10*l.* was awarded in connexion with the Special Certificate examination in Forestry to Thomas Hood (Fellow), of Halstead.

Dealing with the subject of the charter and by-laws, the report contained the following:—

"In November last the Council received a memorial, signed by a large number of members, urging the desirability of introducing some more distinctive title than the letters 'F.S.I.' authorised by the charter, and also pressing upon their attention the advisability of seeking further disciplinary powers for the purpose of checking certain irregularities tending to bring the profession into discredit. The Council were not altogether unprepared to move in the direction suggested, but their contemplated action has been accelerated by the representations referred to, emanating spontaneously from the members themselves. These proposals, having been put into proper form and circulated among the members, were submitted to a general meeting held on Monday, April 14, and approved. A second general meeting for confirming the resolutions was held on Monday, April 28, but in deference to a suggestion that there was a want of complete unanimity among the members as to the adoption of the title 'Chartered Surveyor,' the Council determined to take steps for ascertaining the opinion of the members generally before deciding whether this particular resolution should be submitted for formal confirmation. The other resolutions, dealing with matters of professional discipline, were confirmed by the meeting, and will be forwarded for approval to his Majesty's Privy Council as soon as a decision has been come to with reference to the resolutions held in temporary abeyance."

Satisfaction was expressed that the Inland Revenue authorities had abandoned their attempt to exact legacy duty on the fees of surveyors authorised by will to act in connexion with the administration of the estates of deceased persons, and the Council asked members of the Institution to note that in future they would be relieved from any such liability.

The Council added that considerable additions to the library had been made by the purchase of a number of works, many of which were acquired at the suggestion of members.

The library had further received a very valuable addition in the form of a bequest under the will of the late Mr. Arthur Cates, who directed that his large collection of books should be distributed between the professional societies with which he was connected. Many of the volumes which fell to the share of the Institution are of great value, and some of them of extreme rarity. The library was open during the session on 111 evenings, from October 1, 1901, to March 31, 1902. The total number of attendances was 157, making an average of 1·4 per night, as compared with 2·5 per night in the previous session. There were twenty-eight evenings on which no reader presented himself, thirty-eight on which one attended, twenty-four when two attended, and sixteen on which three attended. The total number of individual members using the library during these evenings was sixty-four (as compared with seventy-two last session), of whom forty-two attended once only. In view of these results, the Council are considering whether the arrangement should be continued.

The surplus income which the Council have secured by careful administration of the finances has enabled them to do something to further objects of a more or less public character identified with the interests of surveyors. Among these may be mentioned an attempt to secure an amendment of the law as to easements of light by the introduction into Parliament during the present Session of a Bill prepared, in collaboration, by a Joint Committee of the Institution and the Royal Institute of British Architects. The main object of the Bill is to do away with, or greatly restrict, the powers of dominant owners under the present law to acquire rights over servient tenements, which amount in some cases to a confiscation of valuable interests, and which in crowded districts may in future seriously hamper owners of property in the development of their estates. With the same object in view the Council have undertaken to make a specific contribution to the costs of carrying an appeal to the House of Lords in the case of Colls *v.* The Home and Colonial Stores, Ltd. This case is a typical instance of the hardship under which the servient owner at present labours, and which, unless modified by the highest Court of Appeal, is likely to be fruitful of injury to property in all parts of the kingdom. Another matter in which the Council have taken action is the question of the legality of agreements, under hand only, when drawn up by surveyors and land agents, in connexion with short tenancies.

In moving the adoption of the report, Mr. A. King observed that it brought before the members the strength and importance of the Institution, which, he trusted, would continue to gain ground. He urged all members to do what they could to increase its efficiency.

Mr. A. Gordon seconded the motion, which was carried.

On the motion of Mr. Hudson, seconded by Mr. R. Parry, a vote of thanks was accorded to the auditors, Messrs. A. C. Newmarch and C. B. Hall, for their preparation of the accounts which had met with so much satisfaction at the hands of the members of the Institution.

Mr. Harston, in moving a vote of thanks to the President of the Council, the Vice-President, and members, eulogised the services of Sir J. Rolleston, who, he said, had acquitted himself admirably in the conduct of the affairs of the Institution, bringing to bear upon the work his special knowledge as a member of Parliament. They had gone through a year of exceptional importance, and their interests had been thoroughly well looked after by Sir J. Rolleston and his colleagues on the Council.

Mr. H. T. Scoble seconded the motion, which was carried by acclamation.

Responding, Sir J. Rolleston assured the meeting that the labours of the Council during the year had not been small, and that the most careful consideration had been given to all matters affecting the interests of the Institution. It had been a great pleasure to him to occupy the honourable position of President, and although he was about to give way to a successor, he would not cease to take an active interest in the work of the Institution.

Mr. Vernon (vice-president) also replied.

Votes of thanks were also accorded to the hon. secretary (Mr. Penford) and the secretary (Mr. Rogers), who acknowledged the compliment.

Mr. Howard Chatfeild Clark having proposed a vote of thanks to the retiring President (Sir J. Rolleston), that gentleman proceeded to invest his successor, Mr. A. Vernon, with the chain of office, remarking, in doing so, that he had brought great ability to bear upon their discussions, and he congratulated the Institution

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in securing his services as President during the next twelve months.

Mr. Vernon, in taking the chair, was loudly cheered. The Institution, he observed, had steadily risen in power and position, and, to some extent, in numbers; but they must always remember that a society, like an empire, was not only to be made, but maintained. He counselled them to pull together for the common good of the Institution, for which he predicted a magnificent future. He would do his best during his year of office, and he felt sure he would have the energetic aid of the Council.

Before the proceedings terminated, the retiring President handed the prizes to the successful candidates in connexion with the recent preliminary and professional examinations.

Illustrations.

THE CENTRAL HALL, ST. PAUL'S SCHOOL FOR GIRLS, HAMMERSMITH.

THIS drawing illustrates the Central Hall, as it will be when completed, of the new school for girls, which is being built for the governors of St. Paul's School at Brook Green, Hammersmith.

The hall is 80 ft. long by 45 ft. wide, and 40 ft. high. Class rooms open from the hall on each side on the ground floor, and also from a gallery on the first floor. The wood screens dividing them from the hall will be glazed.

The roof is constructed with steel principals and purlins, with steel stanchions resting on brick piers in the basement. The stanchions are cased in brickwork. The ceiling will be formed of timber secured to the principals and purlins, and plastered, and will be painted as indicated in the illustration. The room will be panelled, and an organ will be built at the end of it.

Mr. Gerald C. Horsley is the architect of the school, and the contractors are Messrs. Holloway Bros., of Victoria Wharf, Westminster. The constructional steel work has been supplied and fixed by Messrs. Homan & Rodgers. The drawing is exhibited at the Royal Academy.

CROSSES FROM ITALIAN MUSEUMS.

THESE two crosses are very beautiful examples of their respective periods. Nos. 1 and 2 are the front and reverse side of a Byzantine cross in the Brescia Museum. The reverse shows a crucifixion on a chased and modelled plaque which is a comparatively modern restoration, and out of harmony with the archaic splendour of the original. No. 3 shows an enamelled miniature from the lower part of the front about three-quarter full size. The whole cross is studded with choice cameos, enamels, and precious stones.

No. 4 and 5 is a cross in Cremona Cathedral standing if, we remember right, about 6 ft. or 7 ft. high. The figures on either side of the crucifixion are Byzantine, the upper part of the cross from the stalk upwards is thirteenth-century work of great beauty, delicacy, and skill. The base is modern, a fine piece of work of its kind. The enlarged view shows the back of the thirteenth-century portion.

HOUSE AT STANSTEAD, CATERHAM, SURREY.

THIS house, now near completion, is built of brick, with local stone plinth, and red tile roof.

The ground-floor ceilings, &c., are treated in modelled plaster, by Mr. Geo. Baukart.

The builders of the house and stables are Messrs. Walter Holt & Sons, of Croydon, and the architect is Mr. E. Guy Dawber, of London.

NEW CHURCH, LONGSDON, LEEK, STAFFORDSHIRE.

THIS church is to be erected at Longsdon, a village near Leek in Staffordshire. It is to be built of local stone, with a red tile roof.

The architect is Mr. Gerald C. Horsley. The drawing is exhibited at the Royal Academy.

BATTERSEA WORKING-CLASS HOUSES COMPETITION.

DESIGN No. 4 provides for three self-contained tenements containing living-room, two bedrooms, scullery, &c., on each floor, access being gained to each tenant through a common porch.

A separate entrance is provided for the ground-floor tenant, and an entrance at the foot of the stair for the first and second-floor tenants; as well as this an inner entrance-door is also provided in each case. By so doing the staircase and passage is cut off from the public thoroughfare, insuring a cleaner and more comfortable dwelling.

It is intended that a combined dresser and food cupboard (ventilated through the external wall) should be fitted in the living-room and in the scullery. All the necessary fittings are as previously described.

All the floors and partitions will be constructed of fireproof materials. Externally the walls are intended to be faced with stock or red bricks, the window-frames painted white, and the roof covered with green slates; in this case a mansard roof being used to gain a better proportion than could have been obtained by roofing it from the ceiling line of the top story, while at the same time it reduces the cubic capacity to a slight extent.

The contents of the building, which, of course, includes foundations and chimneys, is 23,437 cubic ft., and the estimated cost comes to 781*l.* SMITH & WEALD.

ELECTRIC LIGHTING AT ST. PAUL'S CATHEDRAL.

As already mentioned in "Notes," a special demonstration of the new installation of electric lighting at St. Paul's Cathedral was given on Wednesday evening, at 9 p.m., to representatives of the Press, admitted by ticket.

The electric current for the lamps is supplied at a pressure of 200 volts, partly by the City Company and partly by the Charing Cross Company. As the circuits are laid in duplicate throughout the whole building, even in the event of a complete discontinuance of the supply by one company, only every alternate lamp would go out. The two main distributing-boards for the nave standards and dome are placed in a fireproof recess off the staircase in one of the main piers leading to the Whispering Gallery. They were designed by Messrs. W. A. S. Benson & Co., and are of the Central Station type, mounted on heavy slate bases. From these sub-mains are run to various points, the principal pair going to the large distributing-board in the crypt, where the switching arrangements for the chancel are situated.

The problem of designing the wiring was a specially difficult one, as, owing to the great distances, the cables had to be very heavy, a current density of only 250 amperes per square inch being permissible, as otherwise there would have been an excessive drop in the pressure at the far end. The Silvertown Co., who supplied the cables, state that sixteen miles of wires have been used, the copper alone weighing more than 2½ tons. The wires are generally laid in galvanised iron barrel of substantial make, and in a few places simplex tubing has been used. The wiring is for the most part hidden under the crypt floor, and is accessible by means of inspection-boxes placed at frequent intervals. The vertical wires are carried whenever possible in the hollow centres of the main piers, which are very suitable for this purpose. At present there are about 800 lamps wired, but when it is completed, which will be in about another twelve months, there will be 1,250.

The work has been carried out in an admirable manner by Messrs. W. A. S. Benson & Co., of New Bond-street, under the superintendence of Mr. Somers Clarke, the consulting architect to the Cathedral, and Professor Kennedy, the consulting electrical engineer.

The fittings, which were designed by Mr. Clarke and cast by Messrs. Benson, consist of six large pendants of cast and gilded brass in the choir, hanging from the vault, which, in addition to lighting the floor, throw a glow on the mosaics of the vault by means of upturned lights concealed in cups. There are also eight heavy bronze pendants under the dome, and two others in the transepts; four gilt bracket lights upon the chancel screens; and a ten-light fitting in the apse, which also lights the Jesus Chapel. The five tall standards in the nave and two at the west entrance were designed by Mr. Penrose and Mr. Pegram respectively.

In addition to these, the choir desks have been fitted with standards holding concealed lights, and the crypt has been lighted throughout with the handsome old gas fittings in the shape of hanging Roman lamps, which have been adapted light.

The choir aisles, the entrances, the consistory court, the whispering gallery, and several other points in the church have yet to be lighted, or provided with their permanent fittings.

ARCHITECTURAL SOCIETIES.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—The annual meeting of this society was held at Exeter on Saturday last. In the absence in Italy of the President, Mr. H. G. Luff, of Devonport, the chair was occupied by Mr. J. M. Pinn. The annual report and balance-sheet showed a very satisfactory state of affairs. Mr. W. Hitchens was awarded the book prize for measured drawings. Mr. J. M. Pinn, of Exeter, was elected President for the ensuing year, Mr. A. S. Parker, Vice-President, and Messrs. Bridgman, J. Crocker, and L. Tonar new members of the Council. Mr. Harbottle Reed was re-elected Hon. Sec. and Mr. O. Ralling Hon. Treasurer. At the close of the meeting a visit was paid to the Septic Tanks at Bella Isle, where the Deputy Surveyor (Mr. Moulding) and the Sanitary Inspector (Mr. Wreford) conducted the party over the works, and afterwards the new church of St. David's was inspected under the guidance of the Rev. C. J. V. French (the Vicar).

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—A meeting was held on May 21, Dr. W. de Gray Birch, F.S.A., hon. treasurer, in the chair. Dr. Winstone exhibited a fine copy of a sixteenth-century book on agriculture, bound in vellum. It was printed at Cologne in 1573, and is interesting as showing one of the earliest examples of the (so-called) "Roman and Italian" (not italic) types used together. A paper was read by the Rev. H. J. D. Astley, hon. editorial secretary, in the absence of the author, Mr. M. J. Andrew, F.S.A., entitled "Buried Treasure: Some Traditions, Records, and Facts." Tradition without truth is worthless, and verification of ancient tradition and record is as remarkable as it is interesting. Tempted by a tradition, which must have survived from the Bronze Age at least, the missing treasure-chest of Buckton Castle—an earthwork following the natural lines of the summit of that hill near Mossley, was, in 1730, the object of diligent search with pick and shovel. The tradition is, as usual, in rhyme. Although the search then was unsuccessful, yet about a century ago accident disclosed some verification of the legend, for in making the road at the foot of the camp a quantity of gold beads was discovered and examined on the spot by the grandfather of the writer, who was much interested in such antiquities. Two ancient traditions still hang over the old-world town of Ribchester, some nine miles from Preston. One of these is that its great Roman camp was finally overthrown by the Picts or Scots, and burned over the heads of its defenders. Recent excavations have in a measure given support to the story, for masses of charcoal remains—in some cases interspersed with human bones—were met with in all quarters of the camp, and eighteen months ago Mr. Garstang came upon the granary, the whole contents of which appeared to have passed through the ordeal of fire. The other and better-known tradition, viz., "It is written upon a wall in Rome, Ribchester was as rich as any town in Christendom," somewhat taxes our credulity. Nevertheless, it is curious that here should have been found the finest specimen of its kind in Roman bronze workmanship ever discovered either in this or any other country, viz., the so-called helmet now in the British Museum, which, however, is not a helmet, but the head of a statue wearing a helmet. The old rhyming tradition of Ribchester's wealth may have also referred to the vast treasures of Cuerdale discovered only about seven miles from the town. Here, in 1840, the remains of a leaden chest were discovered, containing some 10,000 silver

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coins and about 1,000 oz. of silver ingots, Danish treasure, for the Great bulk of them had been issued by the Danish kings of Northumbria. At Nottingham, in 1880, a remarkable discovery of coins was made which is intimately connected with a passage in the continuation of Florence of Worcester's chronicler, recording what seems to be the very incident which explains the loss of the treasure. A peculiar feature of this Nottingham find is that all the coins have been subjected to intense heat, and are blistered and cockled by fire. They were found in the basement of an old building whilst excavating for enlarged cellarage, and mostly belong to the reign of King Stephen. The chronicler, after detailing the sudden attack upon Nottingham by the Earl of Gloucester in 1141, relates that a wealthy townsman was made prisoner, and compelled to give up his money. He conducted the plunderers to his cellar, and whilst they were engaged in breaking open doors and locks he contrived to make his escape, locked them all in, and set fire to his house. It is reported that thirty men in the cellar perished in the flames. The discovery of the "Beanorth hoard," the "Tutbury hoard," and the curious circumstances relating to other "finds" were dealt with in a most interesting manner. The Chairman, the Rev. H. J. D. Astley, Mr. Rayson, and others joined in the discussion which followed the reading of the paper.

ENGINEERING SOCIETIES.

THE INSTITUTION OF JUNIOR ENGINEERS.—A large party of the members of this Institution recently paid a visit to the Great Eastern Railway Works at Stratford by the courtesy of the Locomotive Superintendent, Mr. James Holden, M.Inst.C.E. They were shown over the various departments, the special features of interest being indicated to them. In the locomotive machine shop automatic bolt machines and general machinery for dealing with locomotive work. Large planing machines, &c., were in operation in the erecting shop, where locomotives, both new and repaired, were in various stages of construction; in this shop also pneumatic tools were seen tapping and drilling. Pneumatic tools were also at work in the boiler shop, and hydraulic riveters and flanging machines, together with general machinery appertaining to boiler work. The brass foundry contains a pneumatic moulding machine, and in the brass finishing shop above it are special lathes for manufacturing brass details and firebox stays, &c. The party also visited the locomotive department, the Westinghouse brake shop, smith shop, wheel shop, and iron foundry. In the carriage department new main-line composite carriages and suburban carriages were seen in the process of widening, so as to carry two extra passengers per compartment. The saw mills, which contain a large variety of woodworking machines, were also visited. A visit was also made to the running sheds, liquid fuel storage, engine paint shop, and oil gas works.

INSTITUTION OF ELECTRICAL ENGINEERS.—The annual Report of the Committee announces the election of twelve new members during the past year, the total number of members (including sixteen students) being now sixty-six. In the course of the Report it is stated that the Committee have communicated with the Department of Agriculture and Technical Instruction for Ireland with reference to the utilisation of water power, asking that the Board should consider the desirability of taking some steps to secure the collection of data as to available water power at different seasons of the year; also of the sites for water power which are not at present utilised.

FIRE TESTS WITH ROOFS.—The question of the fire-resistance of roofing materials having called for considerable attention in connexion with the Barbican fire, the British Fire Prevention Committee conducted on Wednesday the first of a series of tests in which an ordinary slated roof with an ordinary ceiling was tested in comparison with a vulcanite roof with an ordinary ceiling. The tests, which took place under the usual procedure, and which were attended by a large number of architects, engineers, and public officials, were under the direction of Mr. Ellis Marsland, District Surveyor for Camberwell, and extended for one hour, at a temperature commencing with 500 deg. fahr., and reaching about 1,500 fahr. The slate roof collapsed at an early period, whilst the vulcanite roof did not allow the fire to pass through.

The Student's Column.

PART III.—PRIVATE SEWAGE DISPOSAL.

CHAPTER 20.—METHODS OF DISPOSAL.

SEWAGE DISPOSAL, as it relates to private buildings, does not necessarily imply sewage purification. The foul liquids from buildings may be discharged in their crude state into public sewers, or into rivers, lakes, or the sea. Discharge into sewers is not always possible. Rivers and lakes have been used from time immemorial for receiving the discharges from drains, and if the quantity of fresh water is large in proportion to the sewage, and if it is not used for domestic purposes, little harm has resulted. The drainage from manured lands (dressed, perhaps, with night-soil) is, during heavy rains, often fouler than domestic sewage. But in a thickly-populated country like modern England there is serious danger in allowing rivers and lakes to be used indiscriminately as public sewers, and public opinion is steadily rising against the time-honoured practice. In some of the most densely-populated areas the County Councils are rigorously applying their powers to prevent river-pollution, and their example will probably be followed in other districts, until the discharge of crude sewage into our streams is almost entirely stopped. The practice not only creates a nuisance, but may be a source of great danger if the river is used for water supplies; at the present moment there is nothing but a yard of sand between London and a terrible epidemic.

The discharge of crude sewage into stagnant ponds and ditches is more objectionable to the senses than discharge into rivers, and often creates nuisances, with which Local Authorities have power to deal under the Public Health and other Acts.

Discharge into the sea is sometimes a satisfactory method of disposal, but, if it is improperly carried out, may create a nuisance on the foreshore. In many cases it will be more economical to adopt some method of purification rather than carry the drain to a suitable point of discharge.

In connexion with all these methods of disposal into rivers, lakes, &c., it must not be forgotten that, if one person is allowed to drain into them, others may claim the same privilege, until eventually the volume of sewage may exceed the purifying powers of the fresh water, and an offensive and dangerous nuisance may be created.

Another method, closely akin to the foregoing, is that of discharge into cesspools. If the cesspools are watertight, they are really underground tanks in which the sewage is stored for a period and then removed by pumping or other means and applied to gardens or agricultural lands. Important changes in the sewage undoubtedly take place in these tanks, but these are merely a secondary consideration. Cesspools are constructed primarily for convenience, so that the sewage will have to be removed at distant intervals and not continuously, and (in many cases) so that the contents can be used as liquid manure when required. Old cesspools, however, are almost invariably constructed with pervious walls, and if the soil is of a gravelly nature, the sewage may almost entirely escape by percolation. Such cesspools are seldom or never cleaned out, and the unpurified sewage escaping from them often passes to the nearest wells and pollutes the local water supplies. Cesspools of this kind are now universally condemned, and the only kind which we shall consider are those for the storage of sewage without loss by percolation.

Other methods of disposal are designed to purify the sewage, either for the sole sake of purification or for the purpose of utilising it (as a manurial agent) in the process of purification. In the latter class may be placed nearly all the systems of treatment on land; in the former, chemical treatment and bacteriolysis.

The various methods of private sewage-disposal may, therefore, be summarised as follows:—

1. Discharge of crude sewage into sewers, rivers, lakes, the sea, &c.
2. Storage of sewage in watertight cesspools and ultimate application to land.
3. Direct utilisation on land.
4. Direct purification.

The first method will not be further considered. The second, third, and fourth are merely different methods of arriving at the same result, namely, purification, although in the second the necessity of obtaining this result is often ignored. None of the methods is conveniently applicable under all circumstances, and none, therefore, can be regarded as invariably the best.

CHAPTER 21.—CESSPOOLS.

In urban areas, sewage is, as a general rule, discharged into public sewers, by which it is conducted to outfall-works belonging to the Local Authority. As far as the private individual is concerned, his responsibilities with regard to sewage disposal cease when he has made a proper connexion between the drains of his building and the public sewer. Section 23 of the Public Health Act (1875) gives to Local Authorities the power of compelling the owner or occupier of an existing "house" "to make a covered drain or drains emptying into any sewer which the Local Authority are entitled to use and which is not more than 100 ft. from the site of such house." Section 25 gives an Urban Authority similar power with regard to the drainage of new houses. But whether the building is new or old, the owner cannot be compelled to make a connexion with a sewer which is beyond the specified distance of 100 ft. from the site of the building; "if no such means of drainage are within the distance, then the drain shall empty into such covered cesspool, or other place, not being under any house," as the Authority direct.*

In the absence of convenient sewers, cesspools have been freely used for the reception of sewage, and, although many urban authorities have done their utmost, by means of stringent by-laws and regulations, to do away with old cesspools and to prevent new ones being constructed, they are still used in urban as well as rural districts. In some districts—chiefly those with gravel sub-soils—they are much more common than in others. Thus, in Chichester, prior to 1895, all houses were either undrained or drained to cesspools; in 1896, Dr. Bulstrode reported—"everywhere cesspits and cesspools are numerous; in fact, it would seem that the whole of the gravel upon which Chichester is built is riddled with them."

Gravel soils have been so largely preferred for cesspools because, by building the walls with open joints, the contents of the cesspools can escape, and frequent emptying by manual labour is unnecessary. Dr. Bulstrode stated, in his report on the sanitary condition of Chichester just alluded to, "As regards some of the premises which I visited, the dates, or even the fact of the last emptying of the cesspool could not be called to mind." Cesspools and wells were sunk into the gravel, and the underground water, polluted with sewage, was pumped for domestic use. But Chichester does not stand alone. There are thousands of cesspools still in existence throughout the country, from village to metropolis. New drains may be laid and connected to the public sewer, but the old cesspool may remain, until the collapse of the ground or floor above it leads to its being filled up. Many of these old cesspools are constructed under the floors of houses, and others are in such close proximity as to be almost equally dangerous.

No hard-and-fast rule can be laid down as to the distance which ought to intervene between a cesspool and an inhabited building or a well. In the Model By-laws (both urban and rural) the distances are not stated; in a prefatory memorandum to the Rural By-laws it is said that the local "Council should themselves insert the distances" in the by-laws dealing with cesspools, "having regard to the circumstances of their district." The Local Government Board has, however, advised that the minimum distance of a cesspool from an inhabited building should be 50 ft., and from a well or other source of water-supply 60 ft. By "inhabited building" is meant "a dwelling-house or public building, or any building in which any person may be or may be intended to be employed in any manufacture, trade or business." By "well or other source of water-supply" is meant "any well, spring, or stream of water used or likely to be used by man for drinking or domestic purposes, or for manufacturing drinks for the use of man." Although a distance may be stated in the by-law relating to the proximity of cesspools to wells, the local authority has power, if the wording of the Model By-law is adopted, to enforce a greater distance under special cir-

* For the exact words of these clauses, and for the author's remarks thereon, see Chapter 2.

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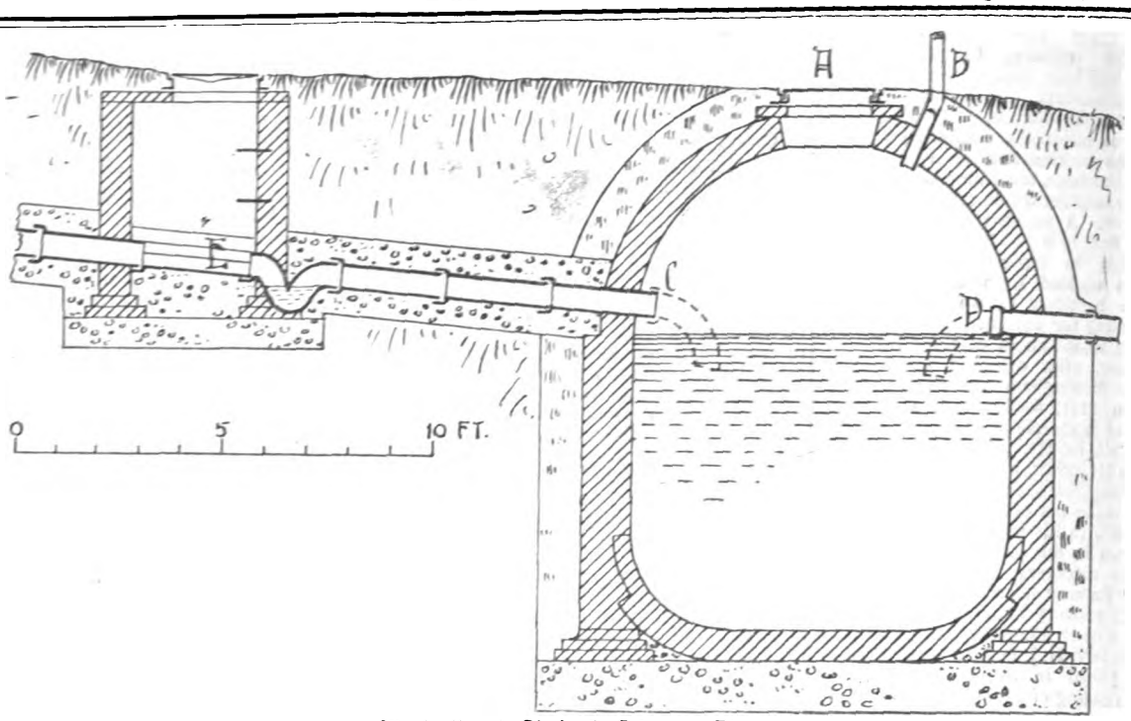

Illustration to Student's Column.—Fig. 91.

cumstances, as the by-law states that a person shall not construct a cesspool within a distance of . . . . feet from any well, &c., "or otherwise in such a position as to render any such water liable to pollution."

The by-laws made by the London County Council under the Public Health (London) Act, 1891, specify a minimum distance of 100 ft. from a cesspool to an inhabited building or to "any well, spring, or stream of water"; there is no qualification as to the use of this water by man, as in the case of the urban and rural by-laws.

The model By-laws (both Urban and Rural) prescribe certain rules which ought to be observed in the design and construction of cesspools. With slight modifications these rules are now enforced in London, and throughout most of the urban districts in the provinces.

In the first place, a cesspool must be constructed "in such a manner and in such a position as to afford ready means of access . . . for the purpose of cleansing such cesspool and of removing the contents thereof," and the position must be such that the contents can be removed without being carried through any dwelling-house, public building, or building in which any person may be employed.

Secondly, the cesspool must not have "any outlet into or means of communication with any sewer;" the London by-laws add "or any overflow outlet."

Thirdly, the cesspool must be constructed in a substantial manner. The Urban Model By-laws specify "good brickwork in cement, properly rendered inside with cement, and with a backing of at least 9 in. of well-puddled clay around and beneath such brickwork." The London By-laws state that the brickwork must be "bedded and grouted in cement," and add that the cesspool "shall be perfectly watertight"; in other respects the requirements are the same as in the Model by-law just quoted. The Rural Model by-law is similar to the Urban, but a backing "of at least 6 in. of good cement concrete" may be substituted for the puddled clay, and other methods of construction may be adopted provided that "suitable material" is used, and that the cesspool is rendered "impervious to liquid." The three sets of by-laws agree in specifying that the cesspool must be "arched or otherwise properly covered over."

Fourthly, every cesspool must be "provided with adequate means of ventilation." These words are common to the three sets of by-laws, but the adequacy or otherwise of any proposed means of ventilation must, it would seem, be determined by the surveyor to the local authority.

A vertical section of a circular cesspool 9 ft. in diameter is shown in fig. 91. The foundation is a bed of cement concrete 15 in. thick, and on this 9-in. brickwork is laid to form the floor. The walls are of brickwork 14 in. thick, and the dome is 9 in. thick. The angles between the floors and walls are rounded. The clay backing, 12 in. thick, is carried up to the top of the dome. The eye of the dome is fitted with an airtight cover A, and ventilation is provided by the cast-iron pipe B, which should be attached to a tree or post so as to discharge the foul air at as high a level as possible. The drain inlet C enters the cesspool above the level of the overflow D, and is intercepted by a trap at E, which may with advantage be placed in a manhole as shown.

A rectangular cesspool covered with a barrel vault or with stone "landings" will be more economical than that illustrated, and this shape may of course be adopted; the angles ought to be well rounded.

In London and some other urban areas overflows are not allowed, and the contents must be periodically emptied, an operation which can most conveniently be performed by means of Merryweather's pneumatic cesspool-emptier. In the country a pump, usually of the chain type, is often fitted to the cesspool, so that the contents can be extracted and used as liquid manure. Where the configuration of the ground will allow, the overflow may be conveyed in drain-pipes to the surface, and utilised for irrigation, in one of the ways to be hereafter described. When an overflow is provided, bends should be fitted to the inlet and outlet as shown by the dotted lines, so that the scum which forms on the surface will not be disturbed. The cesspool is thus converted into a septic tank. It would probably be an advantage if the inlet-pipe of a cesspool without overflow were carried down inside the cesspool to about half the depth.

Where road-detritus enters the drains, a small chamber may be constructed adjoining the cesspool to retain the sand, as this can be more easily removed from the grit-chamber than from the deeper cesspool.

The size of the cesspool must be governed by local considerations. In some districts they are emptied by the Local Authorities at stated periods—usually every week or fortnight—and the cesspool must be of sufficient size to receive the greatest amount of sewage which can be produced in the intervals. In the country, if the overflow is properly treated on land or by filtration, the size of the cesspool may be reduced; a capacity equal to two days' flow will usually prove sufficient for the organic solids to be broken up by the bacteria in the sewage.

When cesspools are adopted, it is a good plan to exclude as much of the rain-water as possible from the sewage-drains, as smaller cesspools will then suffice. There will also be less risk of back-water in the drains; if the rainfall is admitted, and a heavy storm occurs when the cesspool is nearly full, the drains may be flooded and perhaps damaged.

BOOKS RECEIVED.

THE EIGHTEENTH CENTURY ARCHITECTURE OF BATH. By Mowbray A. Green, F.R.I.B.A. Part I. (Bath: G. Gregory).

SANITARY FITTINGS AND PLUMBING. By G. Lister Sutcliffe, A.R.I.B.A. (D. Fourdrinier; *Builder* Office. 5s.)

ROADS: THEIR CONSTRUCTION AND MAINTENANCE. By Allan Greenwell, A.M.Inst.C.E., F.G.S., and J. V. Elsden, B.Sc. (Lond), F.G.S. (D. Fourdrinier; *Builder* Office. 5s.)

HISTORY OF SEPULCHRAL CROSS-SLABS. By K. E. Styan. (Bemrose & Sons 7s 6d.)

THE EARTH IN RELATION TO THE PRESERVATION AND DESTRUCTION OF CONTAGIA. By G. Vivian Poore, M.D. (Longmans, Green, & Co. 5s.)

TRADES WASTE; ITS TREATMENT AND UTILISATION. By W. Naylor. (Charles Griffin & Co. 21s.)

THE SURVEYORS' INSTITUTION

THE country meeting of the Surveyors' Institution began at Cambridge on the 22nd inst. The members were received by the Mayor and other members of the Corporation at the Corn Exchange at ten o'clock, after which the sitting was devoted to the reading and discussion of papers. At 1.15 the Provincial Committees entertained the visiting members at luncheon at the University Arms Hotel, and during the afternoon a party was made up to visit various colleges and other University buildings. Other excursions were made during the visit.

After the reception, the President-elect (Mr. A. Vernon, of High Wycombe) took the chair, and Mr. H. M. Jonas, of Cambridge, read the first paper, which was on "Cambridge." He stated that, although an ancient capital town, Cambridge did not compare in point of size or population with many towns and industrial centres: its characteristics were those of an agricultural town, residential, and above all, educational. Having indicated the position of the town, and alluded to the system of education apart from the University, the paper went on to deal with matters of history connected with the town, dating from Saxon times when it was called Grantanbrycge and was defended by a castle on the north side of the River Cam, constructed as a defence against the Danes, by whom Cambridge was sacked more than once. In the year 1086 there were 400 houses in Cambridge, and in 1901 the number of houses and shops was 8,701, the town having about doubled itself in size during the last fifty years. In the reign of Henry I. Cambridge obtained a royal charter, by which the town was granted to the burgesses at Fee Farm, with the monopoly of the trade of tolls of town and river for a fixed rent of 45*l*. Other charters were granted in subsequent reigns to the time of Charles II. It was not until the thirteenth century that, in the history of Cambridge, the University was first heard of.

The next section of the paper was descriptive of areas, &c., the present area being 3,278 acres. Among other things, the paper stated that the time had now arrived when it was absolutely necessary to extend the boundaries of the borough, and it was proposed to extend them by enclosing portions of the parishes of Chesterton, Cherryhinton, and Grantchester, with the hamlet of Newnham. This alteration of boundary, which must take place within the

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next few years, should increase the area of the borough by about 4,300 acres, and the rateable value by 50,000*l.* As a municipal institution, the Corporation of Cambridge was one of the oldest in England, the appointment of mayor dating back to 1207. The present income of the Corporation from rents of town properties amounts to 2,200*l.* a year, and from tolls, &c., to about 2,500*l.* With regard to public health and sanitation, it was stated that in the sixteenth century the accumulation of filth in the streets, the housing in the town of cows, horses, cattle, and swine, and the habit of turning them out into the streets in the morning, resulted in plague and sickness, in 1546. At the present time Cambridge held a high reputation as one of the most healthy towns in England. A new sewerage system on the precipitation and irrigation principle has just been completed at a cost of about 168,000*l.* After speaking of street paving and lighting, the paper went on to say that after the plague in 1564, Dr. Perne, Master of Peterhouse, proposed that a fresh supply of drinking water should be brought into the town from the streams running from the springs at nine wells in the parish of Great Shelford. The work was carried out at the joint expense of the town and University in 1610, under a scheme by Edward Wright of Caius College, who also planned the New River. The present water supply is excellent. With reference to the roads of Cambridge, which had always been famous, there was one peculiarity, viz., that a portion of the Cambridge to London turnpike road, as far as Barkway, was marked out with milestones in 1729, these being the first milestones put up in England since Roman days, the cost being defrayed from a fund left by a Fellow of Trinity Hall for the purpose. The next matter the paper dealt with was street improvements, and after that the writer turned his attention to open spaces and charities.

The latter part of the communication was devoted to matters in connexion with the colleges. The origin of the colleges, it stated, was interesting and much misunderstood, the general impression being that the University was responsible for the existence of the town, but that was not so. The University in the Middle Ages was a corporation of learned men, established for the purpose of teaching. They did not concern themselves with the feeding and lodging of the students; and the only buildings originally required were places for holding meetings, schools, and lecture-rooms. The individual colleges had come in existence principally by private endowment. From a surveyor's point of view the importance of Cambridge Colleges lay in their being large landed proprietors. The total income of the University and Colleges from real estate, exclusive of funds, was returned by the University Commission in 1873 at 246,288*l.*, but at the present it was, owing to agricultural depression, somewhat short of that amount. On the whole the prosperity of the town and surrounding district was in a satisfactory state, and there was a much greater demand not only for houses but for farms in the districts surrounding Cambridge than could easily be satisfied.

Two other papers were also read, one by Mr. J. Rooke Corbett, on "The Economic Theory of Rent," and the other by Mr. S. H. Cowper Coles on "Sporting Rights."

OBITUARY.

M. BENJAMIN-CONSTANT.—This eminent French painter died on Monday last, at the age of fifty-seven; not to the surprise of those who knew him, and were aware of the malady under which he had been suffering for some months, and from which he had himself no expectation of recovering. He was born in Paris in 1845, and after having been recognised at the Ecole des Beaux-Arts as one of the cleverest pupils of Cabanel, he made his début at the Salon in 1869 by a large picture of Hamlet and the King, illustrating Act III. scene 3 of the play. Since this first picture, which attracted great attention, he has exhibited every year, without a break, a series of pictures, often rather sensational in character, always more or less remarkable and which obtained for him many honorary awards—medal of the third class in 1875; medal of the second class in 1876; the Legion of Honour in 1878; the rank of "Officier" in 1884; the membership of the Institut in 1893; the "médaille d'honneur" in 1890; and the Grand Prix in painting in the 1900 Exhibition. Popular appreciation could not but follow the works of a painter whose Moorish pictures, brilliant in rich and glancing colour, showed also such startling and intense effects of lighting. Among these remarkable efforts may be named "Les Prisonniers Marocains"; "La Soif"; "Le Harem Marocain"; "Le Soir sur les Terrasses"; "Les Favorites de l'Emir"; "Les Derniers Rebelles" (in the Luxembourg); "Les Chérifas"; "Judith"; "La Justice du Chérif"; "Hérodiade"; "Mahomet II.," a colossal work exhibited in the great exhibition of 1878, and now in the museum of Toulouse; "L'Académie de Paris," the large decorative painting for the Sorbonne, which was illustrated in the *Builder*; "Paris Conviant le Monde à ses Fêtes," forming the central ceiling picture in the Salle des Fêtes of the Paris Hôtel de Ville; &c., &c. As a portrait painter Benjamin-Constant had a great and well-merited reputation. Among his best portraits were those of the Duc d'Aumale, of Pope Leo XIII., and that of his own son, whose premature death was to a great extent the cause of the breaking down of the artist's health. Benjamin-Constant was a man of wide general culture, with a general interest in art and literature, a bright and spirited manner in conversation, a man whose society was generally liked, especially among his juniors, to whom he was always kindly and generous. As a painter there was no doubt an element of sensationalism in his art, but it was a sensationalism of so powerful and picturesque a type that one could hardly judge it in a spirit of cold criticism. Some of his larger paintings of Oriental interiors are permeated by an intensity and brilliance of colour which seemed to place them quite apart from the spirit of western art in general. In his sumptuous portraits of ladies one was rather apt to feel that costume was the principal element and the countenance the least successful part of the picture. But if not exactly a great artist he was, taken all round, a most remarkable and almost phenomenal painter, as well in the brilliancy of his effects as in the remarkable extent and variety of the work which he accomplished.

GENERAL BUILDING NEWS.

INSTITUTE, ST. JAMES'S-STREET, S.W.—On the site of the house No. 55, at the corner (south) of Bennet-street, now being pulled down, will be built new premises for the American Dental Institute, from plans and designs by Messrs. Newman & Newman. The contractor is Mr. William Reason, of Roseberry-avenue, Clerkenwell.

ST. PAUL'S CHURCH, BERMONDSEY.—We learn that measures are about to be taken for carrying out some necessary repairs of the fabric, which is greatly damaged through dampness and other causes. The church was built in Kipling-street, for 750 sittings, in 1847-8, in the Early English style, after designs by Mr. S. Sandars Teulon.

ROMAN CATHOLIC CHURCH, SOUTH CROYDON.—Mr. F. A. Walters has been appointed architect of a new church that is to be built in South Croydon, in terms of a gift that has been made by an anonymous benefactor to the Roman Catholic Bishop of Southwark, for the erection of three churches in Stockwell, Croydon, and South Bermondsey respectively.

PRESBYTERIAN CHURCH, MUSWELL HILL.—The foundation-stone of the above building was laid on May 23. The church is designed in the Perpendicular period of Gothic architecture, freely treated. Externally the building will be faced with whole white flints, the dressings being of red terra cotta work. A tower, terminating in a spirelet, will form a prominent feature at the angle of the block, the site being at the corner of two roads. The plan approximates in form to a Greek cross. The ceiling internally is to be vaulted, the large central vault being carried up higher than the others for effect and better ventilation. Electric lighting will be introduced, and low-pressure hot water heating apparatus. The seating accommodation is:—On ground floor, 615; in choir, 34; in end gallery, 81. The contract is let to Messrs. Johnson & Co., Wandsworth. The architects, whose designs were accepted in a recent competition, are Messrs. George Baines and R. Palmer Baines, of London.

TRAINING COLLEGE, LIMERICK.—With reference to our short paragraph (p. 525, *ante*) announcing that a training college for girls had been erected in Limerick, we are now enabled to give further particulars. The building faces South Circular-road. The main entrance is approached by massive granite steps, 14 ft. wide, the retaining walls being capped with heavy cut stone. The whole of the building is faced with compo cement. It has limestone plinths, relieved with moulded limestone strings. The pilasters of the main entrance are of granite, elaborately carved, while on the apex of the pediment is placed a statue of Mary Immaculate, flanked on either side by two carved pedestals. The stone underneath the statue bears the date 1898. There are four entrances to the basement, along which runs a spacious corridor, 170 ft. long by 9 ft. wide, tesselated, and with skirting of chocolate-coloured glazed tiling. Situate in the bay at the north end of the basement is the refectory or dining-room, 56 ft. by 25 ft., capable of affording seating accommodation to 100 students. Behind, are the technical kitchen (in which instruction will be given in cooking) and the technical laundry. On the same floor is a bathroom, 41 ft. by 24 ft. From this floor wide stairs lead up to the top of the building; they are of Ballybricken granite, and have mahoghany balusters supported by ornamental cast-iron railings. At the south end is the chemical laboratory, the dimensions of which are 48 ft. by 24 ft. In the same part of the building is the workroom, in which instruction in various arts will be given. At this end a tesselated passage with glass roof leads to the recreation hall, a one-storied structure detached from the main building. The ceiling of this is of polished pitch pine enriched with carvings, and the lighting is from the centre by means of one of Hellwell's patent lantern lights. The hall is 74 ft. by 32 ft., and at present is used as a chapel, and in the glass-roofed passage leading thereto are constructed the music rooms. On the second floor at the north end is the lecture-room, similar in dimensions to the refectory, while at the opposite end is a classroom. The ceiling in this room is of varied shaded pine laid in herring-bone pattern, with drop moulds and cornices. The walls are of the same material, wainscotted in pitch pine, with moulded capping with a dado of the same material, to a height of 5 ft. The floor is carried on steel joists about 10 ft. apart, and resting on moulded Portland stone corbels. On this floor a number of other classrooms, reception rooms, and offices are situated. On the third and fourth floors are the dormitories, which are arranged in cubicles, while at the opposite end on the same landings are the lavatories. In the centre of the third floor there is a private oratory. With regard to the general fitting up of the building, the main source of water-supply is brought through 4-in. pipes from the lower end to the roof, so that in the event of fire a hose can be fitted over the taps. The building at present is lighted by gas, but each department has been fitted up with electric installation, so that electricity will be used as soon as the Corporation are in a position to supply it. Massive ornamental iron gates, with cut stone pillars, are to form the main external entrance. The plumbing work was executed by Mr. Costelloe, Waterford. Mr. P. Molloy, of Limerick, was the clerk of works, and Mr. M. Glynn, of North Brunswick-street, Dublin, the builder; whilst the whole was designed by and carried out under the superintendence of Mr. Byrne, architect, Dublin.

BUSINESS PREMISES, ABERDEEN.—New buildings, to be erected in Palmerston-road, Aberdeen, by the Port of Hull Trawl Fisherman's Protective Society, provide on the ground floor one double shop for the society and two single shops; the upper floors are for dwelling houses. There is also on the ground floor a large hall with committee rooms, clubrooms, &c. The building will supply accommodation for recreation in the large hall referred to, and the store provides the men with all necessary sea clothing. The estimated cost is 4,000*l.* Messrs. Sutherland & Parie, of Aberdeen, are the architects.

WESTMINSTER CITY HALL.—This building was formally opened on Thursday. The architect is Mr. John Murray, the builders were Messrs. Patman & Fotheringham. The exterior shows a handsome stone front lineable with the existing buildings on either side. The style is an adaptation of English Renaissance. Within are ample offices, committee-rooms, and a council-chamber treated in a sober and substantial manner.

INDUSTRIAL SCHOOLS, GLASGOW.—It is proposed in the Roman Catholic Archdiocese of Glasgow that next year shall be devoted to the raising of funds to erect a suitable memorial to the late Archbishop Eyre. This memorial will take the form of the building of three industrial schools at Bishopbriggs, together with a chapel for the same, the whole to be known as the "Eyre Memorial Industrial Schools." The sum of 40,000*l.* is now in the trustees' hands.

WAREHOUSE, BELFAST.—A large warehouse has just been completed for Messrs Murphy & Stevenson adjacent to their existing buildings at the junction of Ormeau-avenue and Linenhall-street, Belfast. The new block occupies a site on Linenhall-street, with upwards of 170 ft. frontage, by 120 deep. The main buildings are upwards of 50 ft. wide, and are divided into six floors, attaining a height of 83 ft. to the parapet. At each end, circular towers are placed, with flat roofs, about 100 ft. high. At the rear of this building, and approached by a separate gateway, are placed a large covered despatch yard, engine and boiler houses, and dining hall. The ground floor has its principal approach from Linenhall-street, in the centre of the block. On the right is the brown room, and on the left are arranged spacious offices, with large packing-room and hoist. There are two principal fireproof stairs rising through the building. The top floor is arranged for a laundry and smoothing-room, special provision being made for a large supply of water from cisterns in the roof. The buildings are of red brick, with a sparing use of red sandstone; the latter material is used in large rock-faced blocks to the level of the ground floor sills. A feature is made of the main entrance, which comprises a wide, arched doorway, flanked by rusticated pilasters, carrying a bold cornice. Above this is a pierced parapet with blockings terminated in obelisks at a height of 30 ft. above the footway. A carved head, representing a female, indicative of the staple industry, forms the keystone, contrasting with two boldly modelled lions' heads at the level of the caps of the pilasters. The solid walls forming the porch are lined with Irish and other marbles, as is also an octagonal column in the offices. Marble mosaic is used in the vestibule, and terrazzo pavement in the passages, which are lined with ornamental tiles. The woodwork in the offices is of an elaborate character, principally mahogany and teak, polished. The sanitary arrangements have been carried out by Mr. J. Clements, Church-lane; and Messrs. Musgrave & Co. heated the building. The mosaic and terrazzo work is by Messrs. Ebner & Co., London; Messrs. Purdy & Millard executed the marble work, and Mr. George Coulter the painting. The general contractors are Messrs. W. J. Campbell

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& Son, Ravenhill-road; and the architects are Messrs. Young & Mackenzie, of Belfast.

ISOLATION HOSPITAL, CUCKFIELD.—This hospital was opened on May 21. It is situated on Dean's Farm, about two miles from Burgess Hill, on the road running west to Hickstead. On the ground floor of the administrative block are provided the matron's room, doctor's room, nurses' dining-room, needle-room, the kitchen, scullery, storerooms, and offices, a wide corridor running through the building from front to rear. On the first floor are the matron's and nurses' bedrooms, bathroom, &c., and on the second, nurses' and servants' bedrooms. A large open area at the rear of the administrative block, crossed by asphalt paths, is bounded on the east and west sides by the two fever wards of the hospital, and on the north by the enteric and diphtheria ward. Each building is a considerable distance from the other. These wards are all ground floor buildings, with verandahs on one side. The east and west wards are identical in size and arrangement. Each is designed to accommodate ten beds, and is subdivided into two, the larger apartment containing six beds and the smaller four, the nurses' duty-room being placed between the two apartments, with observation windows looking into each apartment. The general height of the wards is 13 ft., the larger apartments being 36 ft. by 26 ft., and the smaller 24 ft. by 26 ft. The windows are numerous and lofty. The walls are finished in granite silicon plaster, and ventilators are fitted under and over each bed. The interior paintings throughout the hospital are of light green colour. The floors are coloured light red, done in papyrolith flooring, a German patent in which wood pulp and magnozite play a part. The verandahs are paved with terrazzo paving, an Italian flooring of cement and marble chips. The wards are warmed with grates throughout, one being in each apartment. In the nurses' duty-rooms are kitcheners, necessary offices, sinks, &c., being provided to each ward. Every ward is allotted a couple of wheeled baths, these being wheeled from outside into the wards when and where required. The north ward, for enteric and diphtheria patients, is similar in design to the other wards, but is smaller, divided into two apartments for two beds each, with the nurses' duty-room between, as in the larger fever wards. There is telephonic communication between the entrance lodge and the administrative block, and there is also inter-communication by telephone between the matron's rooms and the wards. The artificial lighting will be by oil lamps. To the east of the hospital is another range of buildings, called the laundry block, which provides coal stores; a laundry fitted with necessary apparatus; a disinfecting chamber, fitted with Dr. Thresh's patent disinfector; a small mortuary, shed for ambulance, oil store, &c. A rain-water tank is fitted to supply the laundry, the general water supply being from the Burgess Hill Water Company. To the south-east is the septic tank and the land necessary to deal with the drainage of the institution. The entrance lodge contains a hall, living-room, scullery, &c., with two bedrooms. The architect is Mr. G. T. Hine, of London, the building contractors being Messrs. Norman & Burt, of Burgess Hill. Mr. V. C. P. Lewis was clerk of the works.

CHAPEL, TONBRIDGE SCHOOL, TONBRIDGE.—The Archbishop of Canterbury on the 26th inst. consecrated the new chapel at Tonbridge School. It is designed by Mr. W. Campbell Jones to seat 500 persons. Two bays, cloisters, and permanent vestries, however, remain to be added when funds permit; the total cost will amount to between 23,000*l.* and 24,000*l.* The chapel is chiefly built of Kentish sandstone. The roof internally is constructed of pine, which has been painted and decorated in a simple scheme of grey, black, and yellow by Mr. Louis Davis. The length of the completed building will be 156 ft. internally by 41 ft. wide, and the height from the floor to the top of the arched ceiling is 58 ft.

CHURCH ROOM, WALTON.—The memorial stone of a new parish church room has recently been laid. The building is to commemorate the reign of Queen Victoria. The site is opposite the parish church, at the junction of High-street with Cage-lane, and the principal architectural features of the building are an entrance porch facing the main street, and a gable end effectively treated. Built of brick with stone dressings, the porch extends along nearly the whole front, and is surmounted by a parapet; the gable end is carried up in old-fashioned timber and plaster work, which forms the setting of a large bay window, and upon the apex of the roof there is a turret or "flèche" for ventilating purposes. The side walls are supported by buttresses, and the long frontage towards the lane is broken by a half-timbered gable, similar to the front. Internally, the accommodation comprises a hall 60 ft. by 30 ft., lofty and well-lighted; a committee-room 19 ft. by 16 ft., a kitchen, and other offices. At the end of the hall, a platform will be erected, and the wall space behind will be finished in Parian cement, which will set white, and form a permanent sheet for the display of lantern pictures. All the floors are of wood blocks, laid on concrete, and the heating, by hot-water pipes, will be effected from radiators placed in window recesses. Mr. Henry J. Wright, of Museum-street, Ipswich, is the architect; the contractor for the building work is Mr. H. J. Linzell; and the heating apparatus was supplied and fixed by Mr. E. Scott, St. Margaret's-green, Ipswich.

NEW CHURCH, COTTERIDGE, KING'S NORTON.—A church is to be erected at Cotteridge, King's Norton. The plans provide for a massive tower at the west end, but the upper portion of this is not included in the builders' contract. A further 450*l.* will be needed for its completion. In style the structure will be a modern adaptation of the order of architecture prevailing at the close of the fourteenth century, and the materials used will be red Leicester bricks for facing externally and internally, with external details in Doulton's grey buff terracotta, and internal details in green Quareila stone. The roof will be covered with green slates. The plan consists of a chancel with flatly canted apsidal end, 35 ft. long and 27 ft. 6 in. wide, out of which the organ chamber opens on the north side; a nave of five wide bays, 95 ft. 6 in. long, and of the same width as the chancel; north and south aisles and transepts—the latter, with a seating capacity for eighty-one, being used as a morning chapel. It is intended that the tower at the west end shall have a belfry for six bells, the lower story forming a large porch. A corridor flanking the south side of the chancel will give direct access to the mission room at the back of the church, in which are situated clergy and choir vestries—and at the same time serve as a return way for communicants. The nave and chancel will have a height of 32 ft. to the wall plate, with open timber roofs at a flat pitch, and the tower, which is to be covered with a lead flat, will be 75 ft. high to the top of its parapet. The church is to be amply lighted. The nave will have a clearstory with two windows of two lights in each bay, and there are to be coupled windows of one light in each bay of the aisles. The chancel will have a five-light window in the centre, and smaller ones on either side. The principal feature of the west end will be a large window of nine lights, with elaborate tracery. The church will have a seating capacity for 700, exclusive of clergy and choir, and the sittings throughout will be of stained deal. The architects are Messrs. Cossins, Peacock, & Bewlay, whose design was accepted in competition, and the builder Mr. W. Harvey Gibbs, of King's Heath.

SCHOOL BUILDINGS, ELY, CARDIFF.—New elementary school buildings were opened at Ely, Cardiff, on the 26th inst. They have been built at an estimated cost of 4,300*l.*, from plans prepared by Mr. E. G. C Downs, architect, Cardiff, the builder being Mr. Dunn, Ely. They afford accommodation for 204 children in the mixed department and 120 in the infants' department. The buildings are of red brick, with Bath stone dressings, and will be heated by ventilating stoves.

NEW LIBERAL CLUB, NESTON.—On Wednesday evening last the new Liberal Club at Neston (Cheshire) was opened. The building consists of a large hall with gallery and stage capable of seating about 700 people; billiard-room for three tables, which can also be thrown into the large hall, by means of folding screens; dining-room, cloakroom, committee-rooms, kitchen and serveries, secretary's office, four bathrooms, heating chamber, and cellars in basement. A verandah has been placed along the west front, which overlooks the bowling-green. The walls are of brick with red pressed dressings and white plaster gables. The roof is covered with green slates. The internal work is pitch-pine varnished. The heating is by low-pressure hot pipes and radiators. The contract has been carried out by Mr. James E. Evans, of Neston. The heating was done by Mr. Lewis Hill, Liverpool, and the architect was Mr. T. T. Rees, of Liverpool.

SANITARY AND ENGINEERING NEWS.

DEEPENING SOUTHAMPTON WATER.—At a meeting of the Southampton Harbour Board, held on May 20, the desirability of deepening the channel of Southampton Water, so as to accommodate the largest vessels afloat, was under discussion. It is estimated that the proposed dredging operations will involve an expenditure of 75,000*l.* The question was referred to a committee, who have reported that every effort should be made to meet the requirements of the new shipping combine.

CORROSION OF PIPES, CARDIFF WATERWORKS.—The Cardiff Waterworks Committee have had for some time under consideration the effect of the Taff Vawr water on the cast-iron pipes, which are subject to incrustation. Mr. Percy Frankland, F.R.S., Birmingham, who is an expert in matters of this kind, was consulted, and a report presented by him was read. He suggested certain experiments, such as the use of limestone in the filter beds, which would have the effect of hardening the water, but he would not guarantee that these experiments, if adopted, would prevent the incrustation. Mr. C. H. Priestley, the water engineer, also presented a report, in which he stated that to treat the water as Professor Frankland suggested would cost the town 2,000*l.* to 3,000*l.* a year. Any additional lime or other chemicals introduced into the water would have the effect of hardening it, and this for many purposes would be objectionable. —*Western Mail.*

BIRMINGHAM WATERWORKS REPORT. — The Report of the Waterworks Committee of the Birmingham Corporation shows, amongst other things, that the total consumption of water for the year ended March 31 last indicates an increase of 2·15 per cent. over that of the previous year, the daily average being 18·640 million gallons, against 17·92 a year ago. There has been an increase in all the zones, but chiefly in the low level. The increase, moreover, applies both to the measured and unmeasured supplies. The committee lay emphasis on the fact that the considerable shortage in the rainfall of the past winter, combined with the absence of any additional resources beyond those available last year, renders it necessary that the utmost care shall be taken to economise water during the coming summer. Further purchases of land have been made in connexion with the Elan supply, making the areas acquired by the Council for this scheme as follows: Freeholds, 10,326 a.; common and exclusive rights, 20,584; mineral or mining rights, 5,879; manorial rights, 36,03. The Committee records various negotiations necessitated by the Birmingham Corporation Water Bill, which, with amendments considered by the Committee as satisfactory, has now passed all its Parliamentary stages, and awaits only the Royal assent. The amount expended on the Elan Valley works during the year was 202,780*l.*, raising the total expenditure thereon to 1,209,809*l.* The Committee also states that the agreement with Mr. James Mansergh, as engineer in charge of the Elan works, has been made to apply to Messrs. James Mansergh & Sons, a partnership formed of Mr. Mansergh and his two sons. A table shows that the total authorised capital under the Acts of 1875, 1879, and 1892 is 6,000,000*l.*, while 1,800,000*l.* remains to be borrowed. A comparison of the rentals during 1902 and 1901 shows that 150,016*l.* were received, as against 142,570*l.* from domestic supplies; 26 287*l.*, as against 25,05*l.* from unmeasured trade and miscellaneous supplies: and 75,170*l.* against 72,821*l.* from measured supplies. Another table shows that from 9,183,000,000 gallons pumped in 1891, and 6,141,000,000 gallons distributed in 1891, the amount pumped in 1902 was 11,813,000,000 gallons; and the amount distributed 6,785,000,000 gallons. The number of miles of mains in December, 1875, was 252,448, and at the end of the last year 648,173. The expenditure on works and buildings (less depreciation) outside the Elan supply has been in the meantime 347,814*l.*, but the total expenditure has been 5,107,165*l.*—*Birmingham Gazette.*

STAINED GLASS AND DECORATION.

MEMORIAL WINDOW, BAGSHOT.—The parishioners of Bagshot have decided to fill the large west window of the parish church with stained glass, representing King David and King Solomon, together with the Royal arms, in memory of Queen Victoria, who always took great interest in the church, which adjoins the Duke of Connaught's estate. The Duke and Duchess of Connaught have subscribed 150*l.* towards the cost of the memorial.

MEMORIAL WINDOW, SALISBURY CATHEDRAL.—A stained-glass window which has just been placed in the north aisle of the choir of Salisbury Cathedral in memory of the late Lord Radnor, was formally dedicated on Sunday, the 18th inst., by the Bishop of Salisbury. The designing and painting of the window are the work of the Dowager Lady Radnor. The upper section is devoted to a representation of the four Archangels and the lower to the Saints. The following is the inscription: "Thanking God for the dear memory of William, fifth Earl of Radnor, P.C., 1841-1900. This window was painted by Helen Matilda, his wife, and erected by her and her children, Jacob, Wilma, and Stewart." The window is a companion to the two in the south choir aisle to the memory of Jacob, the fourth Earl, and his Countess.

WINDOWS, ROYAL CHAPEL, WINDSOR.—A massive gun-metal cross and stained glass memorial windows have been placed in the Royal Chapel, Windsor Great Park, to the memory of Major Prince Christian Victor, who died of enteric fever at Pretoria in October, 1900. An inscription states that the memorial has been placed there by his friends. It was designed by Mr. A. Z Nutt, architect at Windsor Castle.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT—Messrs. Heathman & Co., the ladder manufacturers, have opened a South Kensington depôt at 351, Fulham-road

THE DRINKING FOUNTAIN, PARLIAMENT-SQUARE, S.W.—Messrs. J. Whitehead & Sons, of Rochester-row, are engaged upon the renovation of the stone and mosaic work of the drinking fountain that was erected in 1865 by the late Charles Buxton to commemorate the labours of Clarkson and Wilberforce, in which Sir Thomas Fowell Buxton, Bart., afterwards shared, in the cause of the abolition of slavery. The fountain, which is illustrated in the *Builder* of January 27, 1866, was designed by S. Sandars Teulon, and, being one of the first of its kind built in London, presents an early example of polychromy as adopted in materials for work exposed to the weather. All of the stonework and sculpture was executed by Mr. Earp; for the roof were adopted plaques of iron, enamelled, and with raised surfaces, then newly introduced by the Skidmore Art Iron Company.

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HOUSING OF THE WORKING CLASSES, LONDON.—A scheme has been drawn up by the Westminster City Council for building, at an estimated outlay of more than 100,000*l.*, on the Regency-street site blocks to comprise 344 separated tenements, having 793 rooms, which, it is calculated, will yield a net rental of 4,139*l.* per annum, after deduction made of 2,535*l.*, or 36 per cent. of a computed gross rental, 6,674*l.*, for outgoings. The proposed accommodation will provide for twelve four-roomed tenements to be let at 10s. 6d., 126 three-roomed tenements at 9s., 161 two-roomed tenements at 7s., and forty-five single rooms at 4s. per week.——The trustees of the Lambeth Hayles Charity have approved the plans and designs prepared by Messrs. Waring & Nicholson for the erection of four tenement houses, to contain thirty-four rooms in all, in Hayles-street, St. George's-road, Southwark.——The Borough Council of St. Pancras will build blocks of houses on the east side of a new street, which is to be laid out in continuation of Burton-street, Crescent-place, to Mabledon-place, Euston-road, and a similar block on the north side of Prospect-terrace, Gray's Inn-road.——The Borough Council of Bermondsey will widen certain streets in Rotherhithe as part of their scheme for the erection of homes for the industrial classes on the Paradise-street and Rotherhithe-street site, to be carried out by Mr. R. J. Angell. Messrs. N. S. Joseph, Son, & Smithem are appointed as architects of the dwellings on the site in Westminster.

PROPERTIES FOR SALE.—On July 8 will be offered for sale at auction the Mount Felix Estate, Walton-on-Thames, of which the house and gardens by the waterside are familiar to frequenters of the river. The property extends over 50 acres, having a frontage of 400 yards to the Thames; and the beautiful pleasure-grounds, laid out in terraces and lawns, are famed for their cedar, pine, and fir trees. The house, formerly the property of the Bennets, Earls of Tankerville, was built from Sir Charles Barry's plans and designs in 1835-9, after the Italian manner, for Charles, fifth Earl of Tankerville, who effected great improvements of the property, near the site of the house which his father purchased many years previously. In the west wing of the house is the tower, of three stories, rising to 70 ft., and square on plan, which forms so conspicuous a feature in the view; the lowest stage is designed as an arcaded portico, which covers the principal entrance into the reception-hall, that measures 45 ft. by 30 ft., of the house.——The manor-house of Ashby St. Ledgers, near Daventry, Northamptonshire, is also placed in the market. It is a fine old building, standing by the north side of the churchyard. The west and south fronts, of Edward III.'s time, are finished with gables and an open parapet. The east front has been considerably altered. The place is closely associated with the history of the Gunpowder Plot as the home of Robert Catesby, a descendant of the John Catesby who acquired the property by marriage with Emma, daughter of Robert de Cranford, *temp.* Richard II. His grandson, Sir William—the "cat" of the oft-quoted couplet—was taken prisoner on Bosworth field. At the reversal of the attainder his son George regained the estates, which included others at Catesby, not far distant, and at Lapworth, Warwickshire, in 1495. After Robert Catesby's death in the defence of Holbeach House, Kingswinford, Ashby St. Ledgers, having been escheated to the Crown, was granted in fee, in 9 James I., to Sir William Irwing, who in 1612 sold it to Bryan l'Anson, an Alderman of London. In 1703 Joseph Ashley, of Great Broughton, bought the manor from l'Anson's descendant, and it remained in his family until about fifty years ago. There is a local tradition that the conspirators used to meet in the small chamber, having a bay window, above a gateway that stands between the house and the church. The church, dedicated to the Virgin and St. Leodegarius, Bishop of Autun, contains many brasses and monuments, comprising memorials of the l'Ansons and the Ashleys; of Sir Richard Catesby, a brass, 1553; of Sir William Catesby (*ob.* 1470) and his two wives Philippa and Johanna; a highly elaborated brass within the altar rails of Richard III.'s favourite Sir William Catesby and his wife Margaret Zouche; and in the south or Trinity aisle a brass, reputedly of their grandson William (*ob.* 1518), of a knight in plate armour, kneeling on a cushion, with the coat-arms of that house on his tabard.

PROPOSED STREET IMPROVEMENTS, BIRMINGHAM.—The question of street widening has recently occupied much of the attention of the Public Works Committee. In a report to the Council, the Committee have recommended the purchase from the Baths and Parks Committee, of a piece of land jutting on to the roadway in Green-lane. They also consider that Dale End should be widened. Near St. Peter's Church the width of the carriage way is only 24 ft., and in order to improve the street, especially having regard to its probable use as a tramway route, they recommended that 35 yards of land be purchased from the Young Men's Christian Association. They also advise the widening of Vauxhall-road and Sladefield-lane.

SUBWAYS IN LONDON.—The City Engineer (Mr. D. J. Ross), in a report to the Corporation on the subject of the works executed during last year by the Public Health Department, states that beneath the City streets there are one and a half miles of subways under the control of the Corporation, but there are other subways not controlled by the City authorities. The lengths of gas, water, telegraph, and other tubes, laid in the corporate subways extend over eleven miles, being an increase of three miles during the year. The electric light and telegraph conduits alone contain some thousands of miles of wire. The inspector of subways reports that 15,335 workmen and others were admitted during the year for various purposes. The engineer also submits some figures with reference to the cleansing of the City, within which more than 300,000 persons pass the day and nearly 100,000 carriages enter and leave. The quantity of water for washing was 37,708,690 gallons, while the amount of refuse removed was sufficient to fill 44,975 vans, together with sweepings and slops from the public ways; making a total of 75,000 loads. The refuse destroyed at Lett's wharf was represented by 22,657 loads, which produced a residum of 3,961 loads of valueless clinker, for the removal of which the Corporation had to pay.—*Times*.

HOUSING AT NORTHALLERTON.—Dr. W. Balgent, the Medical Officer to the Northallerton Urban Council, has reported to the North Riding County Council that house accommodation for the working classes in the Northallerton area requires extension and improvement.

LARGE CLOCK, EDINBURGH.—The new clock which has been erected over the Waverley Station Hotel, in Princes-street, Edinburgh, is the second largest in Scotland. The diameter of the face is 12 ft. 9 in. The framework of the face is cast iron, and it is glazed with opal glass a ¼ in. in thickness. The numerals are also of cast iron, and each of the figures is about 2 ft. in length. The centre part of the face is composed of eight panes of opal glass, cut in diamond shape. The minute-hand is 6 ft. 4 in. long, and the hour hand 5 ft. The pendulum is 14 ft. long, and weighs over 4 cwts. The dials are to be illuminated with electricity, regulated automatically. A machine will switch the light on and off, and will be adjustable for different lengths of days. The contractors were Messrs. Hamilton & Inches, Princes-street, Edinburgh.

YORKSHIRE WESLEYAN CHAPELS, &C.—Among the cases submitted to the Wesleyan Chapel Committee at their recent meeting were the following from Yorkshire and the North:—Doncaster: The erection of a new chapel at Bawtry, at an estimated cost of 1,680*l.*, with accommodation for 370 worshippers. Ripon: A new chapel at Aldfield, religious services now being held in a room. The proposed outlay is 540*l.* Bradford (Otley-road): Purchase of Bethesda Church, at a cost of 1,222*l.*, with seating accommodation for 450. Easingwold: A new chapel at Crayke, to seat 100 persons, at an estimated cost of 600*l.* Two chapels in Ilkeston circuit are to undergo extensive alterations, also chapels in the Malton, Withernsea, Doncaster, and Clitheroe circuits. Additional land and cottages are acquired at Headingley, Leeds, at a cost of 2,000*l.* A school enlargement at Doncaster is to cost 1,000*l.* New ministers' houses are to be built at Chesterfield, cost, 1,100*l.*; Newark, 1,020; Tadcastle, 820*l.*; Retford, 948*l.* New organs are to be put in Halifax (Wesley), cost, 750*l.*; Denby Dale (Thurlston Church), 200*l.*; Wath-upon-Dearne (Haugh), cost, 300*l.* Land is to be acquired at Easingwold for extension.—*Sheffield Telegraph*.

ELECTRICITY WORKS, MANCHESTER.—The generating station in Stuart-street which has been erected by the Manchester Electricity Committee was formally opened on the 27th inst. The station, the completion of which will enable the Electricity Committee to provide the necessary current for the electric tramways and to increase very considerably the supply of electricity for lighting and motor purposes in the city, covers an area of 8½ acres. Within the building there are to be two installations—the present installation of 15,000 horse power, devised by Dr. Kennedy, and a second installation of 12,000 horse power, in accordance with a scheme of extension prepared by Mr. G. F. Metzger after his appointment as chief engineer in 1901. Under Dr. Kennedy's scheme six 2,500-horse power steam alternator sets are being installed, in addition to twenty-four water-tube boilers and other plant. Three-phase alternating currents of a frequency of fifty cycles per second are generated at an "extra high pressure" of 6,500 volts, and are transmitted at this pressure to the sub-stations. The supply from the sub-stations is at 500 to 550 volts pressure for supply to the tramways, and at 410 and 205 volts pressure for lighting and power purposes. The buildings at Stuart-street consist of a steel framework, filled in with walls of brickwork. This design has been adopted, in the first instance, in view of the importance of completing the works with all possible speed. The boiler-house, pumproom, and engine-house are all on an extensive scale. Workshops will be provided in a separate building, above which will be placed a large storage feed-tank to contain 500,000 gallons of water. In connexion with this scheme ten sub-stations are being erected upon the south side of the city. In order that sufficient power might be available for running the Hyde-road and Stockport-road tramways on June 1, special efforts have been made to complete the 200 ft. chimney (another chimney 250 ft. high will also be erected), the north and centre bays of the boiler and engine houses, and certain portions of the plant which they contain, as well as the sub-stations at the Polygon, Bennett-street, Levenshulme, Heaton Norris, and Denton, and the cables connecting Stuart-street and the sub-station. Under the scheme of Mr. Metzger two machines of 6,000 h.-p. each, are to be put down. The buildings required to house this additional plant are, however, to be of sufficiently large dimensions to accommodate 24,000 h.-p. These buildings which have not yet been erected, will be similar in character to those already described, and ten additional sub-stations are to be provided in connexion with this installation. When both schemes have been completed, the total horse power available at the various works of the electricity department (Dickinson-street, Bloom-street, and Stuart-street) will be 58,000 h.p., and 360 miles of cables will be needed to transmit the current. The Tramways Committee alone will require current for 800 cars, and the lamp connexions will amount to half a million 8-c.p. lamps.

CAPITAL AND LABOUR.

BRICKLAYERS' WAGES ADVANCED, LONG EATON.—An advance of wages has been granted to bricklayers in Long Eaton. Last November the members of the Bricklayers' Society gave notice of an advance of a halfpenny per hour and a code of working rates to be drawn up, this notice to expire on the first day of June, 1902. A meeting was arranged between the employers' association and a deputation of the bricklayers. The association was fully represented, and the employees were represented by the president, secretary, and treasurer of the branch. After a long discussion, during which the men's delegates placed their arguments before the employers in a most forcible and sensible form, the employers decided to give the advance, and sign the code of working rules without alteration. This will bring the wages of bricklayers up to 9d. per hour. Seven years ago the various departments of the building trade in the Long Eaton district, with the exception of the carpenters and joiners, were all practically without a shadow of organisation. Through the efforts of six men, under the leadership of Mr. W. Angrave (the organising secretary of the Long Eaton and District Trades and Labour Council), the branches were thoroughly organised, while advances of wages have been secured for the bricklayers, labourers, painters, joiners, and masons without any serious dispute. The only strike that has occurred, was the builders' labourers, and that was only of ten days' duration. Nearly two years ago the Building Trades' Federation was founded by the secretary of the Trades Council, and now all branches are affiliated, with a total membership of 350.—*Nottingham Express*.

PAINTERS' WAGES, BATH.—Mr. T. S. Cotterell presided over a joint meeting of the Master Builders', Painters', and Decorators' Association and the Amalgamated Society of Decorators and Painters, held at Bath on the 23rd inst. After a long conference, the men retired from the meeting. On returning, the chairman said the employers had given carefui consideration to all points brought before them in all their bearings. They had decided to receive the rules submitted to them by the men, with the exception of two items. In rule 1 they had decided to raise the wages to 6½d. per hour instead of 7d. asked for, and in rule 6, "Walking time to be allowed to all jobs up to three miles from the Guildhall, at the rate of three miles per hour," would be altered from "the Guildhall" to "the workshop."

LEGAL.

BUILDER'S COMPLAINT AGAINST A NEWSPAPER.

IN the Chancery Division of the High Court of Justice on the 27th inst., the case of William Brown & Son *v.* the *Daily Mail*, came before Mr. Justice Joyce on a motion by the plaintiffs, builders and contractors, for an injunction to restrain defendants from printing or publishing any statement to the effect that the contract or contracts for the erection of the Midland Railway Hotel at Manchester had been taken out of the hands of the plaintiffs and given to Mr. James Stewart, of the firm of Messrs. Stewart & Co., or to Messrs. Stewart & Co. It seemed that the plaintiffs had contracted for the erection of the buildings in question and that Mr. James Stewart, or his firm, who were American contractors, were engaged by the Midland Railway Company to supervise the erection of the hotel in some way with the object of expediting it The defendants had published in their paper under headings such as "Contracts Lost to England" and "American Energy," &c., paragraphs to the effect that Mr. Stewart had obtained the contract for the erection of the hotel, and this the plaintiffs complained had caused them serious loss and injury in their business. The defendants subsequently published corrections of these misstatements and apologised, and in court, through their counsel, expressed regret for the mistake which had been made, and offered to pay the costs of the action. They also gave an undertaking not to further publish the statements complained of.

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His Lordship, upon this undertaking, made no order on the motion.

Mr. Lawson Walton, K.C., Mr. Younger, K.C., and Mr. Higgins appeared for the plaintiffs, and Mr. Hughes, K.C., and Mr. Sheldon for the defendants.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

1,640.—WATER SUPPLY (DOMESTIC): *S. M. Rutnagur.*—A shaft along the axis of a cylindrical casing carries an inner rounded and weighted tipping-tank which engages with a pin upon a ratchet-wheel to be turned with a handle from the outside. The valve within the extended and upper portion of the casing is mounted upon a screw having arms that will engage with two pins upon the periphery of the tipping-tank. When, therefore, one pin tips the tank the valve is opened, and water flows through a pipe and a port into the tank to fill the tank. After the tank is full it will tip towards the right hand, whereupon the other pin will strike the arm and shut the valve. For a less amount of discharge the handle will serve to tip the tank at any time, and, in a variant form, the opposite turning of an oscillating handle will effect that object. Confer also Nos. 13,796 of 1900 and 1,203 of 1901.

1,602 3.—HOT-WATER APPARATUS FOR BATHS: *L. Roovers.*—For automatically supplying gas to the burners when the water has been turned on, and for the reversed operation, the inventor places the water-supply pipe in communication with a Bourdon tube, and inserts into the gas-supply pipe a valve having a liquid seal of which the rod is joined by means of a series of levers to the free end of the tube. 1,693.—The heating-grate of the geyser or similar heater is secured to the base of the apparatus by the two ends of its air and gas inlet pipe, the one end being fitted with a mixing-chamber and the other end being closed; a nozzle (for which see No. 12,562 of 1896) distributes the water on to a cone-shaped plate.

1,704.—A ROAD WATERING AND SWEEPING MACHINE: *F. T. Collins.*—The self-propelled sweeper carries a dirt receiver and a rotating brush upon bearings in the sides of a hood pivoted along the axis of shafts, and on the shafts are the pulleys that transmit motion from a motor to the brush, whereof the pressure is regulated with adjustable counter-weights upon levers; motion is transmitted to the driving wheels by an intermediate shaft fitted with an equalising-box and an engaging and disengaging clutch. Pipes, fitted with regulating valves, convey water from a tank to two sprayers at each end of the brush; an air-pump worked with an eccentric and gearing maintains in the tank a certain amount of pressure, which is regulated by interposing a spring between the two parts of the eccentric rod, whereof the one slides as its pin engages with a slot in the other part.

1,750.—KEYLESS LOCKS: *L. Dove.*—One end of the bow or staple is set in engagement with a recess in the body of the lock, whilst its other end is pivoted on to the lock-casing; of two plates carried by the pivot-bolt (which is passed through the body) the front plate is channelled for engagement with a stud upon the body. A pin will enter into a hole in the bolt when in a particular position. A recess extending from the channels of the front plate enables one to slide the bolt and plates relatively to the body, so that the recess will be uncovered for the engagement, or disengagement, of the bow when the bolt and plate have been adjusted in accordance with a pre-determined collocation of signs or figures upon the bolt-head and the plate. The lock will be fastened at the dislocation of the setting when one slides the bolt and plates backwards and turns the plates and bolts. The mechanism will avail for a sliding bolt for tills, cupboards, and so on, by joining the plates to a detent-pin, to be drawn out of a hole in the bolt, whereupon one can work the bolt with a thumb-bit or a key.

1,751.—IMPROVEMENTS IN DRY CLOSETS AND THEIR PAILS: *F. F. Bennett.*—The bottom of the receiving pail is perforated, and underneath it are arranged within a wheeled frame two or more perforated trays having air spaces above and below them. Liquid is absorbed by peat or other suitable material laid in the trays, or it may be collected in a funnel and be conveyed directly to the trays. Perforated pannels at the back provide ventilation to the closet.

1,784.—A METHOD OF RENEWING STAIR-TREADS: *F. Jensen.*—For cutting out worn portions from the treads and replacing them with fresh wood is devised a crown saw, carried upon a spindle and worked with handles, which cuts out the worn portion. A chisel is then used for the removal of the pieces, and an adjustable iron or cutter fastened beneath a plate that is pivoted on one of a row of pins and can be moved from one pin to another for the planing of the entire surface of the recess. The spindle that carries the saw is secured in a standard which can be adjusted in three directions.

1,821.—APPLIANCES FOR VENTILATION: *H. Ridgway.*—The air-current is regulated by mechanism that comprises an actuator, in two parts, that shuts or opens the valves or bars of the ventilator, and means of coupling the two parts to one another; the two faces of each bar of the ventilator are plain and gridded respectively. Offset portions of a track or guide that extends across the frame are detachably connected to lugs that hang from the under side of the frame. Studs on the guide which supports the two-part actuator form pivots for the ventilator-bars at one end, the bars being carried at their other ends upon pivot-screws that are tapped into a flange that hangs from the frame. Additional means are supplied for working one bar alone, and for preventing the actuator from moving sideways. For working two of the bars together is devised a coupler having a lever whereof the rounded fulcrum rests upon a recess in one part of the actuator, and a hook that engages with the other part. The lever has a projection that is to be pressed towards a foot-piece whereby the two parts of the actuator will become separated through the disengagement of the hook.

1,833.—FLUSHING APPARATUS: *A. G. O'Brien.*—Above the tank is arranged a container for some granulated disinfecting material. The discharge-pipe of the container has two valves that are carried upon a rocking lever joined to the pull chain. The lower valve will be closed, and the upper valve will be opened, by the working of the chain in order to raise the flushing valve, but the valves will resume their former places as soon as the chain is freed, whereupon the disinfectant drops into a basket at the lower end of the discharge-pipe, to be dissolved by the water in the tank.

1,869.—AN APPLIANCE FOR USE WITH INCANDESCENT GAS BURNERS: *E. M. Goldstraw.*—The burner is cleaned by impelling air into a Bunsen-tube by means of a ball, mouthpiece, and so on, fitted upon the end of a tube which should have a clip or seating for closing the air-inlets of the Bunsen-tube into which the nozzle of the main tube is not introduced. Two nozzles and a communicating air-channel may be made in one piece with the seating or clip.

1,873.—A CONTRIVANCE FOR SASHES, SHUTTERS, &C.: *F. Parsons.*—In order that sashes may counterbalance one another and be moved at one and the same time in opposed directions the inventor attaches racks to the stiles of sliding sashes, or shutters, and sets them in gear with middle pinions that are carried in metallic frames, the frames being inserted into the outside frame or casing.

1,909.—MEANS OF ESCAPE FROM FIRE: *F. à Brassard.*—On a carriage is set a telescopical standard which supports a "jumping sheet" whereof the outer edges are joined to the upper ends of a set of rods pivoted on to the top of a section tube; the rods can be folded together and be opened outwards with stretchers that are joined to a socket which is worked with racks and pinions. When the escape is not being employed the sheet and its supports are folded together and removed from the standard.

1,920.—IMPROVEMENTS IN WINDOW CASEMENTS: *F. C. Moore.*—For purposes of repair, cleaning, &c., the casement is fitted with pivots or studs that slide in curved guiding-slots fashioned in the frame, and the casement is pivoted on to tapered links or flaps which are hinged on the frame. When one opens the casement upon its hinges in the ordinary manner an oval crank-plate, worked by the hand, prevents the studs from moving in the slots, since the crank-plate presses against a fixed pivot-pin which is set in alignment with the hinge-pins of the casement.

1,958.—EXTINCTION OF FIRE: *F. Wright.*—A heavy stopper, which its own weight retains in place, is used for closing the acid-bottle that is hung in a wire cage affixed to the screw-cap of the main holder. Into the recess between the cap-flange and the conical stem of the stopper is inserted a washer. The stopper will fall out and effect a mixing of the acid and alkali when the holder is inverted.

1,994.—ELECTRICAL ENERGY METERS: *Allgemeine Elektricitats G.*—The inventors seek to effect a reduction of the consumption of energy in shunt circuits For an induction motor meter, serving for a three-phase three-wire alternating system that may be unequally loaded, they devise a rotatory disc, which they cause to be acted upon at the opposite sides of its spindle with two coils in mains; the coils co-operate respectively with pairs of coils in a shunt circuit between the mains. The currents in the pairs of coils are 90 deg. and 150 deg. respectively, out of phase with the currents in the former mains when the load is balanced and non-inductive, and that phase displacement in one of the pairs of coils is brought about by so connecting the shunt circuit that the current in it shall flow in a reverse direction from that in the coil in the main, and by making the shunt circuit with an inductance to give 30 deg. displacement. A permanent magnet retards the disc, for which may be substituted two discs upon one spindle, to be independently acted upon by the two magnetical systems, for which see the meter specified in No. 3,050 of 1900.

2,027.—A SELF-CLOSING VALVE: *C. Smith.*—A lug or stop restricts the turning of the upper spindle to which the hand-grip is secured, whilst the lower end of that spindle is bevelled for adjustment with the similarly bevelled end of the lower spindle. The casing has a vertical groove in which slides a pin that projects from the guiding disc of the lower spindle. The valve will be opened against the pressure of the spring that normally keeps it shut when one turns the hand-grip, so as to cause the nose upon the upper spindle to force the lower spindle downwards.

2,037.—A COMBINED PIPE-WRENCH: *E. L. Tryon.*—Holes in the handle take a rod that can be turned with its thumb-piece for the adjustment of the two jaws, and a socket in the handle takes the screws which hold fast the stem of the fixed jaw the other jaw, sliding on the stem, engages with a screw that freely turns in the fixed jaw, and the rod is to be jammed into a socket in it. The tool serves for a pipe-wrench, having a notch in the sliding jaw and a toothed dog in a socket in the other jaw opposite the notch. A wheel opposite another notch in the sliding jaw will cut rods or wires; one face of the fixed jaw can be used as a hammer, and there are recesses in the two jaws for a tap or drill.

2,040.—A DEVICE FOR HANGING LAMPS: *F. Mucke and Deutsche Continental Gas G.*—A clip, for which confer No. 14,404 of 1900, adjusts the supporting rod vertically, and has a retaining extension-piece adjustably mounted upon a horizontal arm pivoted on to a clip; a set of cross-bars upon the vertical rod may be substituted for the clipping-device, two tubes or a bent rod may replace the extension-arm, and cam-like rollers or eccentrical wedging clips may be used for clipping the suspension rod; over a pulley that slides separately upon a single rod is passed the chain for lifting or lowering the lamp, and the gas-burner is joined to a swivelling gas-pipe that is screwed into a cone screwed on to a shell, the gas-supply pipe and a plug being screwed on to the shell.

2,066.—A CALLIPER GAUGE: *E. Laurent and H. Icard.*—The gauge is fashioned of metal in the shape of a rigid bow, and there is a set of graded and faced blocks for taking a number of different and defined thicknesses of the work. A pair of the blocks is fitted in sockets at the two ends of the bow.

2,076.—A WINDOW-SASH FASTENER: *J. Ramsy, J. Burns and F. Haywood.*—A socket secured to the lower sash is bored out in a portion of its length, the rest of the hole being screw-threaded, to the upper sash is fastened a corresponding but shorter socket, having a threaded hole in its length. The screw-threads in the former socket are engaged by a screw which is to be screwed into the hole in the latter socket. For fastening the sashes with a key that fits the end of the screw, the key is slotted that when inserted it shall pass the cross-bar of a tube in the bored-out part of the socket on the lower sash, and the due registering of the two sockets is effected by a taper groove in one that engages with a projection from the other.

2,086.—AN APPLIANCE FOR USE WITH CONDENSING-OIL OR GAS STOVES: *F. Hatcher.*—To adapt the stove for heating kettles and similar purposes, the inventor diverts the heated products of combustion up a chimney into a chamber, and thence down pipes into a lower condensing chamber. For heating a kettle, &c., one removes from the top of the upper chamber a cover that lies on the same level as that of the perforated top plate. An ordinary flat-bottomed kettle can be used if the perforated plate is removed, too.

MEETINGS.

SATURDAY, MAY 31.

Edinburgh Architectural Association.—Visit to Stirling.

Incorporated Association of Municipal and County Engineers.—Meeting at Town Hall, Newbury. 2 p.m. Mr. S. J. L. Vincent, Assoc.M.Inst.C.E., on "Newbury Municipal Work." Visits to places of interest in the district afterwards.

Northern Architectural Association.—Visit to Durham.

MONDAY, JUNE 2.

Institution of Junior Engineers.—Visit to the new Signal Cabin of the South-Eastern and Chatham Railway. Meet at Charing Cross Station 7 p.m.

Society of Engineers.—Mr. C. Rous-Marten on "Some Twentieth Century Locomotives." 7.30 p.m.

WEDNESDAY, JUNE 4.

British Archæological Association.—Rev. H. J. Dukinfield Astley, M.A., on "Tree Worship: Ancient Rites and Modern Survivals, particularly in the British Isles." 8 p.m.

Royal Archæological Institute of Great Britain and Ireland.—Mr. H. Jones, F.S.A., on "Roman Remains lately found in Greenwich Park." 4 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting. 8 p.m.

Royal Archæological Institute.—General meeting. 4 p.m.

THURSDAY, JUNE 5.

Royal Institution.—Mr. M. H. Spielmann on "Contemporary British Sculpture." III. 3 p.m.

FRIDAY, JUNE 6.

Royal Institution.—Sir Benjamin Baker on "The Nile Reservoir and Dams." 9 p.m.

SATURDAY, JUNE 7.

Northern Architectural Association.—Students' Sketching Club Excursion.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 10.—By EDMUND RICHARDSON (at Appleby).

Warcop, &c., Westmorland.—The Warcop Tower Estate, 179 a. 0 r. 3 p., f. £5,65

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May 13.—By LANGRIDGE & FREEMAN (at Tonbridge)

Hadlow, Kent.—Hadlow-rd., The Hermitage and and 7¼ a., f., p. £1,250

By DEBENHAM, TEWSON, & CO.

Stepney.—Rectory-sq., &c., i.g.r.'s 164*l.*, u.t. 62 yrs., g.r. 110*l.* 1,010

Rectory-sq., &c., i.g.r.'s 147*l.*, u.t. 62 yrs., g.r. 90*l.* 1,060

Plumstead, Kent.—225 and 227, High-st. (S), u.t. 84½ yrs., g.r. 9*l.* 10s., y.r. 82*l.* 1,190

237, High-st. (S), u.t. 84½ yrs., g.r. 4*l.* 15s., y.r. 40*l.* 590

Hoxton.—157, 159, and 161, New North-rd. (S), u.t. 31 yrs., g.r. 18*l.* 18s., y.r. 160*l.* 1,670

175 to 191 (odd), New North-rd. (s), u.t. 31 yrs., g.r. 56*l.* 14s., y.r. 455*l.* 4,595

Pimlico.—Hindon-st., i.g.r. 31*l.* 10s., u.t. 22 yrs., g.r. 8*l.* 8s., with reversion 290

By WILTSHIRE & THURGOOD.

Lewisham.—22, Lewisham-hill, u.t. 39 yrs., g.r. 12*l.*, e.r. 70*l.* 550

By P. M. PUCKRIDGE (at Melksham).

Melksham, Wilts.—Shurnhold Estate, 141 a. 2 r. 37 p., f. 9,800

By STEPHENSON & ALEXANDER (at Swansea).

Llanedy, &c., Carmarthen.—The Plas Llanedy Estate, 688 a., 0 r. 3 p., f., including mines and minerals (in lots) 12,620

By G. LOVEITT & SONS (at Coventry).

Coventry, Warwick.—3, Regent-st., f., y.r. 25*l.* .. 570

11, Warwick-row, f., y.r. 35*l.* 640

Queen Victoria-rd., stabling and gdn., u.t. 90 yrs., g.r. 13*l.* 14s. 4d., y.r. 19*l.* 160

May 14.—By H. DONALDSON & SON.

Dalston.—95 and 97, Shrubland-gr., u.t. 47½ yrs., g.r. 14*l.*, y.r. 74*l.* 610

73, Parkholme-rd., u.t. 90 yrs., g.r. 8*l.* 8s., p. .. 750

Clapton.—19, Powell-rd., f., e r. 32*l.* 515

Walthamstow.—1 to 6, Grigg's-rd., f., w.r. 171*l.* 12s. 1,610

By FULLER, MOON, & FULLER.

Caterham Valley, Surrey.—Tupwood New-rd., Tetuan and ¼ acre, f., p. 1,995

By ROGERS BROS.

Peckham.—23 and 25, Adys-rd., u.t. 72 yrs., g.r. 10*l.*, y.r. 60*l.* 610

Camberwell.—11, Grosvenor-ter., u.t. 53 yrs., g.r. 7*l.* 5s., q.r. 38*l.* 375

By RUSHWORTH & STEVENS.

Holloway.—27, Parkhurst-rd., u.t. 50 yrs., g.r. 8*l.* 10s. 515

By C. & F. RUTLEY.

Caterham Valley, Surrey.—High-st., five freehold houses and shops, y.r. 206*l.* (in lots) 3,635

High-st., freehold livery and posting stables with house adjoining, y.r. 100*l.* 1,925

High-st., three houses and shops, f., y.r. 129*l.* . 2,400

High-st., house and shop, with blacksmith's forge, stabling, &c., f., y r. 60*l.* 890

High st. (near), freehold stabling and coach-house buildings, y.r. 10*l.* 210

1, 2, and 3, Beulah cottages, f., w.r. 54*l.* 12s. .. 440

Mount Pleasant, the Laundry, f., w.r. 32*l.* 10s. . 330

Upper Mount Pleasant cottages (four), f., w.r. 52*l.* 300

By TOMLIN & CO.

Forest Hill.—167 and 169, Stanstead-rd., f., y.r. 52*l.* 815

Stanstead-rd., f.g.r. 8*l.*, reversion in 41 yrs. 285

Kilmorie-rd., f.g.r. 28*l.*, reversion in 94½ yrs. .. 700

By S. WALKER & SON.

Peckham.—6 and 7, Lyndhurst-sq., f., e.r. 110*l.*.. 1,710

8 and 9 Lyndhurst-sq., f., y.r. 55*l.* 890

10, Lyndhurst-sq., f., y.r. 43*l.* 920

Denman-rd., a plot of freehold land 430

Hackney.—16, Church-cres., u.t. 51½ yrs., g.r. 6*l.* 6s., e.r. 40*l.* 410

Forest Hill.—36, St. Germains-rd., f., y.r. 32*l.* .. 450

By A. BURTENSHAW & SON (at Hailsham).

Hailsham, Sussex.—2 to 8, Millwalk-cottages and a cottage adjoining, f., w.r 68*l.* 8s. 800

Westbam, Sussex.—Upper and Lower Tothams Enclosures, 18 a. 0 r. 25 p , f. 1,630

Two enclosures of marsh land, 12 a. 0 r. 2 p., f. 1,140

Pevensey, Sussex.—Two enclosures of marsh land, 11 a. 3 r. 27 p. f. 480

By CUNNAH & ROBERTS (at Middlewich).

Davenham, Cheshire.—The Cross Lanes Farm, 68 a. 2 r. 11 p., f. 3,500

Middlewich, Cheshire.—Six cottages and 7 a. 1 r. 7 p., f. 750

A freehold field, 6 a. 2 r. 29 p. 380

By T. WOODS (at Hounslow).

Hounslow, Middx.—London-rd , The Hollies and Caswell House; also building site adjoining, f., p. 3,225

1 to 7, Holly-pl., f., w.r. 113*l.* 2s. 1,425

1 to 9, Blake's Cottages c., w.r 89*l.* 9s. 8d. 1,200

May 15.—By LANGRIDGE & FREEMAN (at Maidstone)

Yalding, Kent.—Collier-st., Spitzbrook Estate, 190 a., f., y r. 355*l.* 6,130

By R. & C. SNELL (at Axminster).

Kilmington, Devon.—Closes of land, 22 a., f. 1,725

Mount Hungary Closes, 19 a., f. 140

By CRANFIELD & OLIPHANT.

Balham.—Chestnut-grove, f.g.r.'s 43*l.* 1s., reversion in 74 yrs. 1,085

By EMPIRE FREEHOLD DEVELOPMENT CO.

Kensington.—46, Sinclair-rd., u.t. 73 yrs., g.r. 15*l.*, y.r. 60*l.* 650

30, St. James's-sq., u.t. 75 yrs., g.r. 15*l.* 15s., e.r. 65*l.* 455

By FAREBROTHER, ELLIS, & CO.

Old Bond-st.—No. 44 (S), area 1,105 ft., f., y.r. 600*l.* 19,700

Wimbledon Common.—Parkside, Brant House and 2¼ a., f., p. 9,000

Hamstead.—19 and 20, New End, f., y.r. 64*l.* 16s. 865

By FIELD & SONS.

Bermondsey.—7 to 13, Earl Cottages, u.t. 18¼ yrs., g r. 3*l.* 10s., w.r. 163*l.* 16s. 670

27 and 29, Earl-rd., u.t. 18¼ yrs., g.r. 5*l.* 15s., w.r. 65*l* 235

Peckham.—123 to 129 (odd), Peckham Park-rd., and 25, Bird-in-Bush-rd.. f., w.r. 130*l.* 8s..... 2,040

29 and 31, St. Mary's-rd., u.t. 31 yrs.. g.r. 15*l.*, y.r. 72*l.* 400

Southwark.—19, Prices-st., c., w.r. 20*l.* 16s..... 210

By GLASIER & SONS.

Winterbourne St. Martin, Dorset.—Perpetual fee farm rents of 77*l.* 17s. 3d. per annum £2,050

By NEWBON, EDWARDS & SHEPHARD.

Caledonian-rd.—No 300 (S.), u.t. 42 yrs., g.r. 5*l.* 11s., y.r. 50*l.* 460

Holloway.—92, Georgs's-rd., and 7, Hope-st., f., y.r. 52*l.* 16s. 510

Highgate.—22, Langdon Pk.-rd., u.t. 77½ yrs., g r. 7*l.*, y.r. 40*l.* 490

Homerton.—51A, 53, and 55, Digby-rd., f., w.r. 50*l.* 14s. 590

Hackney.—3, 6, 7, 8, and 10, Ruthven-st., u.t. 49½ yrs., g.r. 22*l.* 10s., y.r. 181*l.* 12s. 1,490

By PYKE, PYKE, & HOWLAND.

Tottenham Court-rd.—26, Tottenham-st., f., y.r. 110*l.* 1,600

Caledonian-rd.—Bingfield-st., The Pembroke Castle p.-h., i.g r. 105*l.*, u.t. 38½ yrs., g.r. 45*l.* 1,150

Finsbury Park.—St. Thomas-rd., The Plimsoll Arms p.-h., i.g.r. 105*l.*, u.t. 65 yrs., g.r. 30*l.*.. 3,235

By STIMSON & SONS.

West Smithfield.—5, Cloth Fair (S), f., y.r. 48*l.*.. 970

New Cross.—81, Woodpecker-rd. (S), and stabling in rear, u.t. 59½ yrs., g.r. 7*l.* 10s., y.r. 70*l.*.... 830

Nynehead-st., a plot of building land, f. 170

Brixton.—47, Knowle-rd., u.t. 60 yrs., g.r. 5*l.* 10s. y.r. 38*l.* 335

Herne Hill.—45, Dulwich-rd., u.t. 61 yrs., g.r. 4*l.* 10s., y.r. 45*l.* 410

Dulwich.—2, Piermont-rd., u.t. 76 yrs., g.r. 6*l.* y.r. 34*l.* 310

Peckham.—139, Hollydale-rd., u.t. 71½ yrs., g.r. 4*l.* 15s., y.r. 31*l.* 8s. 280

20, Mortlock-gdns., u.t. 51½ yrs., g.r. 4*l.* 10s., p. 127, Gloucester-rd., u.t. 40½ yrs., g.r. 8*l.*, e.r. 40*l.* 220

Stratford.—112 to 122 (even), Maryland-rd., u.t. 70 yrs., g.r. 18*l.*, w.r. 146*l.* 18s. 250

1 to 20, Ruth-st., u.t. 70 yrs., g.r. 42*l.*, w.r. 399*l.* 7s. 875

By EDWIN EVANS (at Clapham Junction).

Battersea.—29, Granfield-st., u.t. 64¾ yrs., g.r. 4*l.* 10s., w.r. 35*l.* 2s. 2,095

41, Middleton-rd., u.t. 67 yrs., g.r. 5*l.* 10s., y.r. 36*l.*, ... 228

7, Cairns-rd., u.t. 76 yrs., g.r. 6*l.*, y.r. 30*l.* 340

114, Mallinson-rd., u.t. 75¾ yrs., g.r. 5*l.* 5s., y.r. 39*l.* 245

May 16.—By C. H. BROWN.

Kennington.—6, Fairford-grove, u.t. 28½ yrs., g.r. 5*l.* for 11½ yrs. and 6*l.* thereafter, w.r. 41*l.* 12s. 295

By WATERER & SONS.

Walton-on-Thames, Surrey. — Oatlands Pk., Marrowells and 5 a. 1 r. 17 p., f., p. 2,910

By WYATT & SON (at Emsworth).

Westbourne, Sussex —Penny Lane, &c., five arable fields, 44 a. 2 r. 29 p., f. 1,565

Prinstead, Sussex.—Plummer's Field and piece garden ground, 7 a. 3 r. 37 p., f. 295

May 21. - By JOHN H. BULMER.

Charlton, Kent.—1, Sundorne-rd., u.t. 65½ yrs., g.r. 4*l.*, e.r. 32*l.* 340

Deptford.—13, Hoopwick-st., u.t. 65¾ yrs., g.r. 4*l.* 15s., w.r. 31*l.* 4s. 360

Rotherhithe.—47, Union-rd., u.t. 46 yrs., g.r. 4*l.*, p. 405

By FOSTER & CRANFIELD.

Enfield.—Chase Side, The (late) British Schools, area ¾ acre, f., p. 1,800

Walthamstow.—34, 36, 38, 40, 50, and 52, Hazlewood-rd., u.t. 77 yrs., g.r. 25*l.* 4s., w.r. 163*l.* 16s. 1,075

By ALEX. H. TURNER & CO.

Hounslow, Middx.—St. Stephen's-rd., Perivale Lodge, f., p. 1,350

By WILLIS, CROUCH, & LEE.

Lambeth.—5 and 7, Priory-rd., f., y.r. 85*l.* 1,475

Pimlico.—1 and 3, Winchester-st., u.t. 26 yrs., g.r. 18*l.*, y.r. 120*l.* 985

Holloway.—308 to 318 (even), Hornsey-rd., f., y.r. 216*l.* 3,600

By WM. NORTON (at Leintwardine).

Leintwardine, &c., Hereford.—5 freehold fields, 17 a. 1 r. 20 p. 560

By FRANCIS PITTIS & SON (at Totland Bay).

Totland, Isle of Wight.—Yarmouth-rd., a freehold building site, 7 acres 2,150

Yarmouth-rd., enclosures of land, 4 a. 1 r. 14 p., f. 780

Yarmouth-rd , enclosure of pasture, 3 r. 25 p., f. 120

Alum Bay-rd., block of building land, 4 a. 3 r. 14 p., f. 1,300

Yarmouth-rd., freehold meadow land, 1 a. 1 r. 9 p. 130

May 22.—By BISLEY & SONS.

Rotherhithe.—270, Rotherhithe-st. (S), f., y.r. 30*l.* 500

Rotherhithe-st., a plot of land, area 5,372 ft., f... 130

5 to 13 (odd), Swan-lane, f , w.r. 89*l.* 14s. 1,120

7, Paradise-st. (S), f., y.r. 24*l.* 340

23, St. Marychurch-st., f., w.r. 2*l.* 2s. 290

12, Fulford-st , f., w.r 24*l.* 14s. 300

Bermondsey.—62 and 63, Salisbury-st., f., w.r. 3 *l.* 8s 495

112 to 122 (even). Lynton-rd., u.t. 37 yrs., g.r. 24*l.*, w.r. 189*l.* 16s. 1,360

9 and 10, Lynton-mews, u.t. 33½ yrs., g.r. 7s., w.r. 52*l.* 250

40, 41, 42, 43, and 43A, Enid-st., u.t. 15 yrs., g.r. 7*l.* 10s., w r. 119*l.* 12s. 480

By BROAD, WILTSHIRE, & PENNY.

Sydenham.—Rowland-gve., f g r.'s 5 *l.*, reversion in 6½ and 64 yrs. 1,108

Rowland-gve., f.g.r.'s 70*l.*, reversion in 6½ and 54 yrs. 1,535

By HERRING, SON, & DAW.

Streatham.—5, Killieser-av., u.t. 77 yrs., g.r. 18*l.*, e.r. 80*l.* 600

By C. C. & T. MOORE.

St. George's East.—7 to 33 (odd), Everard-st., f., w.r. 279*l.* 10s. 2,840

Limehouse.—20, Limehouse-causeway, c., w.r. 20*l.* 16s. 205

4, 6, 12, and 14, Endive-st., u.t. 63 yrs., g.r. 8*l.*, w.r. 86*l.* 8s. 4d. 230

Chadwell Heath, Essex.—Willow-rd., four plots of building land, f. 115

By NEWBON, EDWARDS, & SHEPHARD.

Stroud Green.—75, 89, and 91, Florence-rd., u.t. 76½ yrs., g.r. 22*l.*, y.r. 138*l.* 1,445

Canonbury.—1, Sebbon-st., u.t. 16 yrs., g.r. 6*l.* 6s., y.r. 33*l.* £145

Islington.—1 to 5, Dibden-st., u.t. 42 yrs., g.r. 30*l.*, w.r. 156*l.* 800

9, 11, 13, 15, and 18, Pickering-st., u.t. 42 yrs., g.r. 30*l.*, w.r. 149*l.* 10s. 675

Hoxton.—106, Murray-st., u.t. 40 yrs., g.r. 5*l.* 5s., y.r. 36*l.* 355

By STIMSON & SONS.

Kentish Town.—Hawley-rd., f.g.r.'s 3*l.* 10s., reversion in 36½ yrs. 380

Clarence-rd., f.g.r.'s 2*l.* 10s., reversion in 36½ yrs. 403

Hartland-grove, f.g.r.'s 4*l.*, reversion in 36½ yrs. 440

Haverstock Hill.—Nos. 51, 53, and 55, u.t. 35 yrs., g.r. 22*l.* 10s., y.r. 208*l.* 1,400

Nos. 57 and 59, u.t. 36 yrs., g.r. 18*l.*, y.r. 170*l.*.. 910

Walworth.—Deacon-st., i.g.r. 30*l.*, u.t. 63 yrs., g.r. 10*l.* 190

Brandon-st., &c., i.g.r. 225*l.*, u.t. 48 yrs., g.r. 152*l.* 1,120

Brandon-st., &c., i.g.r. 140*l.*, u.t. 62 yrs., g.r. 80*l.* 960

Brixton.—Geneva-ter., i.g.r.'s 34*l.*, u.t. 64 yrs., g.r. 2*l.* 610

Bermondsey.—343, 345, and 347, Southwark Pk.-rd. (S), f., y.r. 110*l.* 1,280

Brixton.—Atlantic-rd., &c. i.g.r.'s 45*l.*, u.t. 64 yrs., g.r. 10*l.* 700

Notting Hill.—Oxford-gdns., i.g.r. 15*l.*, u.t. 73 yrs., g.r. 10*l.* 310

Ladbroke-grove, i.g.r. 8*l.*, u.t. 61½ yrs., g.r. nil 165

By J. A. & W. THARP.

Leyton.—33, Vicarage-rd., f., y.r. 26*l.* 470

8, Amberley-rd., f., p. 360

By R. & C. SNELL (at Axminster).

Colyton, Devon.—Suddon's Farm, 76 a. 2 r. 30 p., f. 3,200

Road Pitt Farm, 130 a. 2 r. 27 p., f. 3,350

Purlbridge Mill Farm, 25 a., 0 r. 33 p., f. 1,500

Four closes of overland, 17 a. 2 r. 21 p., f. 155

Blackacre holding, 18½ a., f. 1,070

May 23.—By ARBER, RUTTER, WAGHORN, & BROWN.

Westminster.—12, Regent-pl., f., y.r. 35*l.* 1,000

25, New-st., f., p. 750

By B. PERCY ABRAMS.

Bethnal Green.—93 to 99 (odd), Treadway-st., u.t. 34½ yrs , g.r. 16*l.*, w.r. 139*l.* 2s. 680

Tottenham.—56, Tynemouth-rd., u.t. 67¼ yrs., g.r. 5*l.* 10s., e r. 28*l.* 265

By DUNCAN & KIMPTON.

Forest Gate.—41, Sebert-rd., u.t. 82 yrs., g.r. 7*l.* 7s., y.r. 32*l.* 240

Brixton.—1, Trelawn-rd., u.t. 77½ yrs., g.r. 6*l.* 10s., y.r. 34*l.* 275

Camberwell.—24 and 25, Rust-sq., u.t. 56 yrs., g.r. 12*l.* 16s., w.r. 91*l.* 445

Peckham.—51 and 53, Dunstan-rd., u.t. 75 yrs., g.r. 10*l.*, w.r. 67*l.* 12s. 360

1 and 12, Tappesfield-rd., and 12, Banstead-st., with stabling in rear, u.t. 66 yrs., g.r. 9*l.* 5s., y.r. 67*l.* 8s. 350

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; w.r. for weekly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.			
Hard Stocks	1 11 0	per 1,000	alongside,	in river
Rough Stocks and Grizzles	1 9 0	,,	,,	,,
Facing Stocks	2 12 0	,,	,,	,,
Shippers	2 5 0	,,	,,	,,
Flettons	1 8 0	,,	at railway	depôt.
Red Wire Cuts ..	1 12 0	,,	,,	,,
Best Fareham Red	3 12 0	,,	,,	,,
Best Red Pressed Ruabon Facing.	5 5 0	,,	,,	,,
Best Blue Pressed Staffordshire ..	4 6 6	,,	,,	,,
Do., Bullnose	4 11 0	,,	,,	,,
Best Stourbridge Fire Bricks	4 6 0	,,	,,	,,
GLAZED BRICKS				
Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,,	,,
Headers	12 0 0	,,	,,	,,
Quoins, Bullnose, and Flats	17 0 0	,,	,,	,,
Double Stretchers	19 0 0	,,	,,	,,
Double Headers..	16 0 0	,,	,,	,,
One Side and two Ends	19 0 0	,,	,,	
Two Sides and one End	20 0 0	,,	,,	,,
Splays, Chamfered, Squints.....	20 0 0	,,	,,	,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,,	,,	,,
Quoins, Bullnose, and Flats	14 0 0	,,	,,	,,
Double Stretchers	15 0 0	,,	,,	,,
Double Headers..	14 0 0	,,	,,	,,
One Side and two Ends	15 0 0	,,	,,	,,
Two Sides and one End	15 0 0	,,	,,	,,
Splays, Chamfered, Squints.....	14 0 0	,,	,,	,,
Seconds Quality White and Dipped Salt Glazed....	2 0 0	less than best.		

[*See also page 551.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums	Designs to be delivered
*New Labourers' Dwellings	Liverpool Corporation	250*l.*, 150*l.*, 100*l.*	Sep. 15
*Municipal Buildings, Fire Station, Public Baths, &c.	Tottenham U.D.C.	200*l.*, 100*l.* and 50*l.*	Sep. 23
*Memorial to Queen Victoria at Allahabad	The Committee	2,000 Rupees	Nov. 1

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Iron Building	Grimsby Corporation	H. G. Wyatt, Civil Engineer, Town Hall, Grimsby	June 3
Sewerage Works	Easingwold R.D.C.	Fairbank & Sons, Civil Engineers, 13, Lendal, York	do.
Alterations to Workhouse	Eastry (Kent) Guardians	W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	do.
Sewerage Works, Roundhay and Seacroft	Leeds R.D.C.	Spinks & Pilling, Engineers, 20, Park-row, Leeds	do.
Sewerage Works	Sudbury (Suffolk) Town Council	T. W. A. Hayward, Civil Engineer, Town Hall, Sudbury	do.
Additions to Stables, Weston-super-Mare	Mr. R. Dart	S. J. Wilde, Architect, Weston-super-Mare	do.
Drainage Works, &c.	Bristol Corporation	T. H. Yabbicom, Civil Engineer, 63, Queen-square, Bristol	do.
Road Works, Victoria-road	Great Crosby (Lancs) U.D.C.	W. Hall, Civil Engineer, Council Offices, Great Crosby	do.
Sewer, Abbey-street	Wicklow U.D.C.	Surveyor, Town Hall, Wicklow	do.
Road Works, Cranbrook-road, &c.	Croydon Town Council	E. Mawdesley, Town Hall, Croydon	do.
Tennis House, &c., The Park	Hebburn U.D.C.	Surveyor, Council Offices, Hebburn	do.
Vicarage, Rhayader, Radnor	..	R. W. Thomas, Architect, Llandrindod Wells	do.
Cottage, Bowling Green-street, Warwick	..	F. P. Trepess, Architect, 1, Church-street, Warwick	do.
Two Houses, Elland, Yorks	..	F. F. Beaumont, Architect, Southgate-chambers, Halifax	June 4
Sewerage Works, Tirphil	Gelligaer R.D.C.	J. P. Jones, Engineer, Hengoed, via Cardiff	do.
Sewerage Works, Stapenhill-road, &c.	Burton-upon-Trent Corporation	G. T. Lynam, Borough Surveyor, Town Hall, Burton-on-Trent	do.
Hospital, Newby-lane	Scarborough Town Council	H. W. Smith, Borough Engineer, Town Hall, Scarborough	do.
Sewers, &c., Barton-under-Needwood	Tutbury R.D.C.	Willcox & Raikes, Engineers, 63, Temple-row, Birmingham	do.
Setts (310 yards)	Stainland, &c., U.D.C.	J. H. Walker, Surveyor, Stainland	do.
Road Widening, Skewen	Glam. County Council	T. M. Franklen, Westgate-street, Cardiff	do.
Sewers, &c., Ember-lane, Thames Ditton	Esher U.D.C.	A. J. Henderson, Civil Engineer, Brabant Villa, Thames Ditton	do.
Filter Works, Hough Side	Pudsey (Yorks) Corporation	J. Jones, Borough Surveyor, Church-lane, Pudsey	June 6
Road Materials	Chatham Corporation	C. Day, Borough Surveyor, Town Hall, Chatham	do.
Hospital Pavilion	Prestwich (Lancs) Guardians	T. Worthington & Son, Architects, 46, Brown-street, Manchester	do.
One Hundred Artisans Dwellings, Queenstown, Ireland	Queenstown Naval Dwellings Co.	W. H. Hill & Son, Architects, 28, South Mall, Cork	do.
Church, Sidwell-street, Exeter	..	F. J. Commin, Surveyor, 7, Bedford-circus, Exeter	do.
Church Restoration, Aberdare	..	E. M. B. Vaughan, Architect, Cardiff	do.
Church Restoration, Chapelthorpe, Wakefield	..	Rev. L. Busch, Chapelthorpe, Wakefield	June 6
*Cleaning and Painting 105 Houses, Cricklewood	Midland Railway	Company's Architect, Cavendish House, Derby	do.
Additions to Schools, Newhirst, Ashington	..	Rev. M. Cuthbert, The Manse, Ashington	do.
House, Seafield-square, Bothes, N.B.	Mr. A. J. Sharp	W. Sharp, Rothes	do.
Street Works, Adelaide-road	Chichester Corporation	City Surveyor, Town Hall, Chichester	do.
Waterworks, Austwick	Settle (Yorks) R.D.C.	T. A. Foxcroft, Surveyor, Town Hall, Settle	June 7
Water Mains, near Barnsley	Worsborough U.D.C.	J. Whitaker, Surveyor, Worsborough Bridge	do.
Widening Simonstone-lane	Burnley R.D.C.	S. Edmondson, 18, Nicholas-street, Burnley	do.
Re-building Forge Bridge, Halesowen	Worcester County Council	A. E. Brooks, Surveyor, King's Norton	do.
Water Supply Works	Forres (N.B.) Town Council	R. Urquhart, jun., Forres	do.
Additions to Vicarage, near Castleton	..	T. Stokes, Architect, Thirsk	do.
*Baths and Washhouses, Mansfield, Haggerston	Shoreditch Borough Council	A. W. S. Cross, 58, Conduit-street, Regent-street, W.	do.
Two Houses, Whitehaven	..	Pickering & Co., Architects, 11, Lowther-street, Whitehaven	June 9
*Water Supply Works, Kingsbury, Somerset	Langport R.D.C.	Bailey-Denton & Co., Civil Engineers, Palace Chambers, S.W.	do.
Seven Houses, Lonsdale-road, Barnes	..	F. & W. Stock-r, Architects, 90, Queen-street, E.C.	do.
Engine House, &c., Boughton	Nottingham Corporation	W. B. Starr, Architect, 12, St. Peter's-gate, Nottingham	do.
Water Supply Works, Kingsbury, Somerset	Langport R.D.C.	Bailey-Denton & Co., Civil Engineers, Palace Chambers, S.W.	do.
Road Works	Liversedge (Yorks) U.D.C.	A. E. Rhodes, Architect, Heckmondwike	do.
Vestry, Tyntyla, Llwynypia, Wales	Trustees	Lewis & Morgan, Architects, Tonypandy	do.
Surveyor's Materials	Ely U.D.C.	G. M. Hall, Market-square, Ely	do.
Road Works, Shrubbery-road	Southall-Norwood U.D.C.	R. Brown, Civil Engineer, Public Offices, Southall	June 10
Pumping Station, Reservoirs, &c.	Lydney R.D.C.	J. F. Trew, Civil Engineer, Station-road, Gloucester	do.
*Erection of Mortuary, Canning Town	West Ham Council	Council's Engineer, Town Hall, West Ham, E.	do.
*Making-up Streets	do.	do.	do.
*Paving Sides of Roads	do.	do.	do.
*Shelter for Infectious Diseases	Camberwell Borough Council	Borough Engineer, Town Hall, Camberwell	do.
*Supply of Granite and Flints	Kingston-on-Thames Corporation	Borough Surveyor, Clattern House, Kingston-on-Thames	June 11
*Erection of New Schools	Salford Corporation	B. Bower, 14, Temple-street, Birmingham	do.
*New Pavilion at Borough Sanatorium	Brighton Borough Council	Council's Engineer, Town Hall, Brighton	June 12
Boundary Wall, Ore	Hastings Guardians	A. W. Jeffery, Architect, 5, Havelock-road, Hastings	do.
Road Works, Ruislip, Middlesex	Uxbridge R.D.C.	J. F. Stow, Surveyor, Corn Exchange, Uxbridge	do.
Market, &c., Corporation-street	Dewsbury Corporation	H. Dearden, Civil Engineer, Town Hall, Dewsbury	June 16
Chapel and Lodge, Liverpool-road South	Birkdale U.D.C.	A. Schofield, Architect, 45, Weld-road, Birkdale	do.
Five Shops, Chapel-street	Rugby Co-operative Society	J. T. Franklin, Architect, Regent-street, Rugby	June 17
Drainage Works, Bothwell, N.B.	Lanark County Council	W. L. Douglass, Civil Engineer, District Offices, Hamilton	do.
*Supply of Cast Iron Pipes	Croydon Lunacy Visiting Com.	Borough Engineer, Town Hall, Croydon	do.
*Erection of Dwellings for Working Classes	London County Council	Architect's Department, 19, Charing Cross-road, S.W.	do.
*New Schools at Montague and Houndsfield-roads	Edmonton School Board	Board's Architect, 99, Church-street, Lower Edmonton	do.
*Reconstruction of Hadham Mill Bridge	Herts County Council	Urban A. Smith, 41, Parliament-street, S.W.	June 18
*Public Conveniences, South End Green	Hampstead Borough Council	Borough Engineer, Town Hall, Hampstead, N.W.	June 19
*New Church, Badshot Lea, near Aldershot	The Committee	Mission Church, Badshot Lea	do.
*New Workhouse and Infirmary	Hammersmith Guardians	Giles, Gough & Trollope, Architects, 28, Craven-st., Strand, W.C.	June 23
*Erection of Schools	Ilford School Board	C. J. Dawson, Architect, 7, Bank-buildings, Ilford, Essex	do.
*Converting Baths into Technical Institute	London County Council	Architect's Department, 18, Pall Mall East, S.W.	do.
*Stoneware, &c.	South Stoneham R.D.C.	Bailey-Denton, Son, Lawford & Symons, Palace-chmb. Westminster	July 7
*Periodical Painting, Hounslow Barracks	War Department	Royal Engineer Office, 41, Charing Cross, S.W.	No date
Farmhouse, Clydach, Wales	Mrs. Wood	Jones, Richards, & Co., 95, St. Mary-street, Cardiff	do.
Shops and Houses, Ainsworth-road	Bury (Lancs) District Co-op. Soc.	D. Hardman, Architect, Agar-street, Bury	do.
Twelve Houses, Low-road, Horsforth, Leeds	..	W. E. Richardson, Architect, Rothwell, near Leeds	do.
Four Cottages, Outgang Aspatria, Cumberland	..	Mrs. Graham, Outgang, Aspatria	do.
Three Houses, Kinnaird Park, Bromley, Kent	..	W. Prebble, Architect, Bromley	do.
Seventeen Cottages, Woodhouse, Sheffield	..	F. G. Buxton & Co., Market-place Chambers, Sheffield	do.
Restoration, Church, Thurlestone, Kingsbridge, Devon	..	G. H. F. Prynne, Architect, 6, Queen Anne's-gate, Westminster	do.
Library Schools, Newton Abbot, Devon	..	S. Trevail, Architect, Truro	do.
*Additions to Fishponds Church, Bristol	..	E. H. Lingen Barker, Architect, 15, Bridge-street, Bristol	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Applications to be in
*Assistant Surveyor	Acton U.D.C.	180*l.*	June 10
*Engineering Assistant	do.	135*l.*	do.
*Clerk of Works	Southall-Norwood U.D.C.	3*l.* 3s. per week	June 11
*General Assistant	City of Norwich	132*l.*	June 14

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxii. Public Appointments, xviii.

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PRICES CURRENT (*Continued*).

BRICKS, &c.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	31 0	per ton, delivered
Best Ground Blue Lias Lime	25 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 10s. 6d. per yard, delivered
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depot.
Bath ,,	1 7	,, ,,
Farleigh Down Bath	1 8	,, ,,
Beer in blocks	1 6	,, ,,
Grinshill ,,	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 3	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto	3 0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt
,, ,, ,, 6 in. sawn both sides landings	2	7 per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor	12 0 0	per 1000 of 1200 at rly. dep.
,, best seconds	11 10 0	,, ,,
16×8 best ,,	6 17 6	,, ,,
20×10 best blue Portmadoc	11 7 6	,, ,,
16×8 best blue Portmadoc	6 5 0	,, ,,
20×10 best Eureka unfading green	13 10 0	,, ,,
16×8 ,, ,,	7 10 0	,, ,,
20×10 permanent green	10 10 0	,, ,,
16×8 ,, ,,	6 0 0	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles	41 6	per 1,000, at rly. depôt.
Hip and valley tiles	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes)	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles	3 8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 0 0
Deals: best 3 by 9	13 10 0	15 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	10 10	11 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2½ in. by 4½ in. and 2 in by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 11 in.	0 10 0	more than battens.
3 in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft.	
Seconds	4 10 0	5 0 0
Small timber (8 in. to 10 in.)	4 5 0	4 10 0
Swedish balks	3 12 6	3 15 0
Pitch-pine timber (30 ft.)	2 15 0	3 0 0
	3 0 0	3 10 0

JOINERS' WOOD. At per standard.

White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
,, ,, 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
,, ,, ,, 3 in. by 9 in.	12 0 0	13 0 0
,, ,, ,, battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 0	1 0 0

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small ,, ,,	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
⅝ in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
1 in. by 7 in. white, planed and shot	0 11	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6

6 in. at 6d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London £ s. d.	£ s. d.
IRON— Common Bars	7 15 0	8 5 0
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 10 0
,, ,, galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.	10 0 0	- - -
,, ,, to 24 g.	12 0 0	- - -
,, ,, to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g.	16 0 0	- - -
,, ,, 22 g. and 24 g.	16 10 0	- - -
,, ,, 26 g.	18 0 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 0 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 5 0	9 15 0

(Under 3 in. usual trade extras.)

LEAD, &c.

	Per ton in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 7 6	- - -
Pipe in coils	14 17 6	- - -
Soil Pipe	17 7 6	- - -
ZINC—Sheet— Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER— Strong Sheet per lb	0 1 0	- - -
Thin ,,	0 1 1½	- - -
Copper nails ,,	0 1 1½	- - -
BRASS— Strong Sheet ,,	0 0 11	- - -
Thin ,,	0 1 1	- - -
TIN—English Ingots ,,	0 1 3½	- - -
SOLDER—Plumbers' ,,	0 0 6½	- - -
Tinmen's ,,	0 0 8½	- - -
Blowpipe ,,	0 0 10	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2¾d. ,, ,,
21 oz. thirds	3¼d. ,, ,,
,, fourths	3d. ,, ,,
26 oz. thirds	4½d. ,, ,,
,, fourths	4d. ,, ,,
0z. thirds	5½d. ,, ,,
,, fourths	5d. ,, ,,
Fluted sheet, 15 oz.	3d. ,, ,,
,, 21 ,,	4d. ,, ,,
½ Hartley's Rolled Plate	2d. ,, ,,
⅛ ,, ,, ,,	2½d. ,, ,,
⅛ ,, ,, ,,	2¾d. ,, ,,

PRICES CURRENT (*Continued*)

OILS, &c.

	£ s. d.	
Raw Linseed Oil in pipes	0 2 8	per gallon
,, ,, ,, in barrels	0 2 9	,,
,, ,, ,, in drums	0 2 11	,,
Boiled ,, ,, in pipes	0 2 10	,,
,, ,, ,, in barrels	0 2 11	,,
,, ,, ,, in drums	0 3 1	,,
Turpentine, in barrels	0 2 8	,,
,, in drums	0 2 10	,,
Genuine Ground English White Lead	21 0 0	per ton
Red Lead, Dry	20 10 0	,,
Best Linseed Oil Putty	0 8 6	per cwt.
Stockholm Tar	1 12 0	per barrel

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 6
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BEXLEY.—For farm buildings, farm house, and lodge at Woollet Hall, Bexley, Kent, for Mr. Ronald Keep. Mr. Ernest H. Abbott, architect, 5, Warwick-court, Gray's Inn, W.C. Quantities by Mr. A. Johnson, 34, Imperial-buildings, Ludgate-circus, E.C.:—

Farm Buildings.

Stebbing & Pannett	£1,400 0 0	Henry Dunn	£1,326 19 8
		W. H. Smith	1,218 12 3

Farm House.

F. P. Duthoit	£997 0 0	S. Salt	£870 0 0
W. G. Brown	975 0 0	Ellingham & Sons	867 10 9
J. Lonsdale	933 0 0	Stebbings & Pannett	750 0 0
R. & E. Evans	929 0 0		
Henry Dunn	918 15 10		
W. H. Smith	883 0 0		

Lodge.

F. P. Duthoit	£597 0 0	Ellingham & Sons	£457 13 0
R. & E. Evans	526 0 0	Henry Dunn	453 19 6
W. G. Brown	495 0 0	Stebbing & Pannett	400 0 0
J. Lonsdale	487 0 0		
S. Salt	473 0 0		
W. H. Smith	463 5 9		

BRENTWOOD.—For the erection of house and stabling, Hutton, for Mrs. Farnes. Mr. J. Walter Wyles, architect, St. Stephen's Chambers, Telegraph-street, E.C.:—

J. Bruty	£2,582 0 0	Smith & Son	£2,200 0 0
Hammond & Son	2,481 0 0	G. Abbott	2,184 0 0
W. J. Watts	2,278 0 0	A. & J. Cross*	2,063 5 10

BUSHEY.—For the construction of sewers, manholes, &c., at Bushey, for the Watford Rural District Council. Mr. Ernest Lailey, Engineer and Surveyor, Council Offices, Watford:—

Henkins	£1,082	G. R. Mann	£769
Davis & Bennett	1,002	G. Pithin	685
Soam	918	H. Brown, Watford*	629
Meston & Hale	863	Swaker	622
Dean	833	G. F. Judge	600
Dupont & Co.	823		

COWES (I.W.)—For the erection of a residence, Baring-road, Cowes, for Miss Sophia Groves. Mr. Philip Sturdy, architect, Bournemouth.—

H. E. Day	£2,495	Brading & Son	£2,200
Brown & Sons	2,419	John Nichol, Southampton*	1,790
Ball & Son	2,381		

[*See also next page.*

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CROPWELL BUTLER (Notts).—For alterations and additions to the Plough Inn. Mr. Fred G. Martin, architect, Dudley-chambers, Angel-row, Nottingham :—

W. Wilson	£450	0	0	H. Parr, Radcliffe*	£411	1	4
J. Bates	433	0	0				
W. Bickerstaff	412	8	4				

CROYDON.—For the erection of winter gardens and conservatory at 79, Coombe-road, Croydon, for Mr. A. Dyer. Mr. M. S. Reilly, architect, Edridge-road, Croydon. Quantities by Mr. J. Kennard, 104, George-street, Croydon :—

J. Westbrook, Thornton Heath	£1,470	Funnell & Co., Croydon	£1,329
Underwood & Co., Croydon	1,412	Worsfold & Sons, Addiscombe	1,320
W. Potter, Croydon	1,400	Akers & Co., South Norwood	1,233
D. W. Barker, Croydon	1,370	Huntley Bros., Croydon	1,231
Hanscomb & Smith, Croydon	1,344		

DONCASTER.—For the erection of stores, stabling, &c., St. Sepulchre Gate, for Messrs. Ind, Coope, & Co. Mr. J. R. Dodds, C.E., 19, Baxter Gate, Doncaster :—

F. Parkinson	£182	0	G. Mottram	£175	0
J. C. Wombell	179	0	E. Randerson*	164	6

[All of Doncaster.]

ELLON (N.B.).—For additions, &c., to school and house, Drumwhindle, for the School Board. Mr. Wm. Davidson, architect, Ellon :—

Masonry.—R. Mutch, Craighall*	£95	5	6
Carpentry.—R. Burgess*	83	0	0
Slating.—W. Fyvie, Ashlea*	38	15	6
Plastering.—A. & J. Seivewright, Inverurie*	32	13	0

FARNBOROUGH (Kent).—For the erection of a pair of semi-detached houses. Mr. Money Marsland, architect, 68, Great Tower-street, E.C. :—

Wallis & Sons	£1,792	Smith & Sons	£1,549
W. Owen*	£1,460		

HASTINGS.—For the erection of an iron building at the Fish Market, for the Corporation. Mr. P. H. Palmer, C.E., Town Hall, Hastings :—

Lightfoot & Ireland, Stoke Newington* £285

KIRKCALDY, N.B.—For the demolition and reconstruction of The Wheatsheaf Inn, for Mr. James Anderson. Mr. D. Forbes Smith, architect, Kirkcaldy. Quantities by the architect :—

Masonry.—D. Wilkie, Sinclairtown*	£284	0	0
Joinery.—Bogie & Nicol, Kirkcaldy*	404	8	9
Plastering.—W. Grant, Kirkcaldy*	96	0	0
Plumbing.—H. Hutchison, Kirkcaldy*	144	9	0
Slating.—D. Stark, Kirkcaldy*	5	7	6

KIRKCALDY, N.B.—For the erection of tenements, Harriet-street, Sinclairtown, for Mr. Colin Cummings. Mr. D. Forbes Smith, architect, Kirkcaldy :—

Masonry.—D. Wilkie, Sinclairtown*	£744	0	0
Joinery.—H. Masterton, Sinclairtown*	564	0	0
Plastering.—H. Masterton, Sinclairtown*	253	0	0
Plumbing.—D. Dougall, Pathead*	125	10	0
Slating.—G. Johnston, Dysart*	63	16	0

LURGAN (Ireland).—For the erection of seventeen cottages for the Rural District Council. Mr. R. H. Dorman, County Surveyor, Armagh :—

	10 Houses. Each.	7 Houses, Each.
Thos. Collen, Tanderagee	£134 10	£132 10

[Fencing and drains own work.]

WALTHAMSTOW.—For additions, &c., to boys' and girls' departments, Higham Hill Schools, for the School Board. Mr. H. Prosser, architect, School Board offices, Walthamstow. Quantities by Mr. G. T. G. Wright, 3, Great Winchester-street, E.C. :

S. Parmenter, Braintree	£3,863	0	0
J. & J. Dean, Walthamstow	3,476	0	0
B. E. Nightingale, Lambeth	3,350	0	0
Sands, Palmer, & Co., Walthamstow	3,350	0	0
Chessum & Sons, Bow	3,329	0	0
R. & E. Evans, Peckham	3,298	0	0
Viney & Stowe, Haverstock Hill	3,279	0	0
Foster Bros., Norwood	3,257	0	0
Hammond & Son, Romford	3,195	0	0
Knight & Son, Tottenham	2,928	0	0
Pollard & Brand, Tottenham	2,730	0	0
Rowley Bros., Tottenham	2,655	7	2

WOKING.—For the erection of a detached house, Heathside Park Estate, for Mr. E. A. Brine. Messrs. W. G. Jones & Clinton, architects, 3, Broadway, Woking :—

Harris & Son* £1,268

WOKING.—For the erection of a detached house, York-road, for Mr. S. Gloster. Messrs. W. G. Jones & Clinton, architects, 3, Broadway, Woking :—

F. Aylott	£1,250	0	Ingram & Son	£1,153	0
Harris & Son*	1,184	0	G. Allard	1,125	0
A. A. Gale	1,174	0	W. Aird	1,115	18

TERMS OF SUBSCRIPTION.

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VOL. LXXXII.—No. 3056. JUNE 7, 1902.

ILLUSTRATIONS.

The Westminster Dormitory: Plans, Elevations, and Sections as Originally Executed.....Drawn by Mr. Arthur Stratton, A.R.I.B.A.
House, Shire-oak, Headingley..... Mr. F. W. Bedford, F.R.I.B.A., Architect.
The New Holborn Baths ..... Messrs. J. & S. F. Clarkson, Architects.
Battersea Working-class Houses Competition: No. 5 of First Premiated Set of Designs.....By Messrs. Smith & Weald.

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Architectural Engineering.

NO apology is necessary for the introduction of this subject to our readers, for the growth of engineering methods in modern architectural practice is too marked to escape attention. By early training architects are led to think in stone. In the future they may be obliged to think in steel, not exclusively, but to a considerable extent; they must at all events study the practical qualities of steel, and the principles underlying its application, to a much greater extent than they have hitherto done. In the United States the point has already been reached, rendering necessary a system of architecture harmonising with the work of the constructional engineer; and until such a system has been satisfactorily developed it is very unlikely that buildings of the American type will ever be acclimatised in this country. Details of construction stand on a different basis, and many of them may be adopted with advantage, especially those relating to fire-resisting design. It is therefore with interest that we open the pages of a book containing practical and comprehensive data on the subject of steel building construction in the United States.*

The author, Mr. Freitag, may be remembered by our readers in connexion with a previous work on "The Fireproofing of Steel Buildings," which was reviewed by us in 1900, and his present object is to illustrate such of the fundamental principles involved in the construction of modern buildings as may prove useful to architects, engineers, and students. Since the first edition was published so much additional information has become available that revision seemed to be necessary, and the opportunity has been taken of including descriptive accounts of newer buildings than those pointed to in the original edition. The intimate relationship between fireproofing and steel construction has tempted the author to include a good deal of matter already contained in his treatise on the former subject. Therefore, we do not propose to refer to fireproofing methods, except so far as they may directly affect matters appertaining to design.

At the outset it must be said that the title chosen suggests much more ground than is covered by the treatise, the scope of which is limited to a consideration of the problems ordinarily met with in the modern office building, as exemplified in American practice. A complete exposition of the subject implied by the title would properly cover every form of building construction and all varieties of building materials. One of the chief objects of Mr. Freitag's book is to assist those who are engaged in constructive building design to make themselves still better acquainted with the practical details of their art. The first chapter, mainly devoted to a historical account of iron construction and the development of "skeleton" and "cage" construction, needs no comment, and we therefore pass on to Chapter III., wherein the author describes and illustrates a few typical American buildings. The illustrations serve to make clear two distinctive features of such structures; hopeless disproportion of the exterior, and admirable arrangement of the interior. Chicago furnishes the greater number of the examples given. Of these the Stock Exchange building is a dreary waste of windows surmounted by an oppressive cornice, and supported by a base combining the three lower floors in a series of arches, in the middle of which there is an inharmonious doorway on a scale rather suggesting the entrance to a beehive. The Marquette building merely resembles a high factory with no pretension to anything but ugliness, and it is, therefore, moderately satisfactory. A somewhat similar characteristic is found in the Reliance building, a tall tower of rectangular windows, standing on a shop. The Masonic Temple is a huge agglomeration of atomic details, whose bewildering profusion the architects have endeavoured to minimise by the aid of various architectural devices. Much more effective is the simpler form of the Monadnock building and the tasteful style of the New York Life Insurance building, Chicago. There is a very clear attempt to convey the idea of massive unity in the Old Colony building, by adopting the plan of a keep with flanking towers of circular form, although excessive height and too many windows spoil the general effect. Only one example of Bostonian architecture is illustrated by the author, a kind of two-storied carriage-builder's shop of airy construction, carrying what purports to be a massive and rather handsome stone building, with a heavily decorated top and an overpowering cornice richly adorned with wedding-cake ornaments. The greatest monstrosity of all is to be found in the Park-row building, reaching the height of 390 ft. above the street level, and interesting merely as a piece of clever engineering work. Broadway Chambers is an oblong tower, of which the base would serve very well for the support of a decently designed superstructure, the shaft would make an excellent dock warehouse, and the capital might be considered a tasteful pavilion if brought down from the skies and placed amid harmonious surroundings. The Gillender building is certainly a weird incongruity, consisting of an ordinary nineteenth-century house on the top of which a classic temple has been deposited, apparently by accident. The general effect is to remind one of the perilous structures erected by a child when determined to test the complete resources of a new box of building blocks. Judging by the examples given by Mr. Freitag, it must be inferred that American architects have not yet succeeded in finding garments appropriate to the latest production of the steel house-builder. Nevertheless, when ordinary limits of height are not exceeded it is quite possible to obtain pleasing effects, as evidenced by various buildings in New York and elsewhere, but not illustrated by the author.

So much is heard in these days of steel

* "Architectural Engineering, with especial reference to High Building Construction." By Joseph Kendall Freitag, B.S., C.E. Second Edition, rewritten. New York: John Wiley & Sons. London: Chapman & Hall, Ltd. 1901.

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construction in the United States that it is worthy of record that American architects are not universally in favour of the practice. Mr. Freitag mentions that considerable divergence of opinion was shown in an interesting discussion on the subject before the American Institute of Architects, and that the Supervising Architect of the Treasury was reluctant to consider seriously such construction as worthy the dignity and solidity of Government edifices—notably in the new Post Office building for Chicago. On the question of erection the author has some interesting facts to present. Rapidity of construction appears to be an essential factor, and some form of tower or travelling derrick is generally used on large buildings. In some cases special steam cranes are employed, such cranes running on tracks laid over the floor system and pulling themselves up inclines from story to story as the building progresses. The crane-boom and engine-platform revolve on a pivot, so that beams and columns are handled with very little trouble. The form of tower derrick described by the author is clearly calculated to save an immense amount of time and labour. Whenever possible it is arranged to move from end to end of a building, and at the same time to reach out on either hand to the side walls. Frequently it is supplemented by a distributing car running on a narrow-gauge track of light rails. As exemplifying the usefulness of such a contrivance, the author mentions the Siegel - Cooper building, where seven complete tiers, aggregating between 7,000 and 8,000 tons, were erected in nine weeks' actual working time by the aid of travelling derricks of the kind mentioned. In this case, he says, two travellers were installed on opposite sides of the same floor, and a gang of twenty men, with each derrick, were able to erect twenty bays of ironwork in a day, each bay being about 24 ft. square. While the average rate of setting steel frames is given at about two tiers of beams per week of six working days of ten hours each, the rate is often much higher. In the case of the Fisher building, Chicago, an example given by Mr. Freitag, the entire steel skeleton above the first floor was erected in twenty-six days without overtime or night-work. As this building includes nineteen stories and an attic, the record may possibly be useful to some of our readers. Some photographs reproduced in the work before us serve to convey a very striking impression of rapid work. To take a pair of these, relating to the Broadway Chambers, New York—the first, taken November 9, 1899, shows four tiers of beams in position and the projecting ends of some columns, and the second, taken on December 21, 1899, shows the building at the height of eighteen stories, the granite walls being completed up to the third floor, and brick walls thence to the eleventh floor, while four concrete floors appear to be laid above that level. Rapidity of erection is, of course, greatly facilitated by the "veneer" type of wall construction, as work can progress at different stories simultaneously. Thus, in the Unity building, the granite base wall of the first and second stories, the brick wall at the twelfth floor, and the hollow-tile arches of the fifteenth floor were all in hand at the same time. The following table is sufficiently demonstrative of the short time in which a huge building can be completed, the case being that of the New York Life building, Chicago, in which there were 671 individual columns :—

July 17. Old building torn down to grade.
July 31. Laid out new footings.
August 17. Started setting basement columns.
August 31. Started laying granite.
September 5 Started setting tile arches.
September 18. Started laying terra cotta facing.
September 29. All steel set.
November 9. Tile floors all set.
November 11. Terra cotta all set.
November 12 Started plaster.
December 2. Steam plant completed.

It must not be supposed that the steel members are "thrown together," for, as Mr. Freitag tells us, careful work prevails throughout. Column bases are carefully aligned, and only a very thin layer of grouting is allowed between the column pedestal and the masonry bed of the foundation. Cap stones are brought to the most accurate bed possible, with grouting as a thin cement, and not as a leveller. Riveting and punching of the steel members is done as far as possible at the contractor's yard, where also the facing of column ends and of all contact bearing surfaces is performed. Beams and girders are first temporarily bolted by the erectors, who are speedily followed by the field-riveting gang. Bolted connexions are now discarded, because of the cracks caused in plastered ceilings consequent on their use. Column joints, or "splices," are made from 1 ft. to 2 ft. above the floor level, so that the floor beams, resting on brackets near the tops of the columns, may act as braces during erection. All steel is carefully painted after erection, partly so that rust may not be formed on the surface before concrete or other casing is applied, and partly because it is difficult in building work to guarantee a perfect union between cement mortar and metal-work at all points. On the subject of permanence Mr. Freitag mentions a good many facts that are worthy of careful perusal. He shows that the effect of lime upon steel seems to depend very largely upon the peculiar conditions of each case, and comes to the correct conclusion that lime mortar should not be used in any place where moisture is to be anticipated. Considering the low cost of cement in the present day, it certainly seems wise to use this material for the protection of all metal-work, especially as it is also an excellent fire-resisting medium. Some useful notes on painting and paints are to be found at the close of the chapter dealing with the general aspects of the subject now brought forward by Mr. Freitag.

We pass over the detailed descriptions of floors contained in Chapter IV., because they are practically the same as those mentioned in the work on fireproof construction. When discussing live floor loads, the author cites figures tending to show that the requirements of the New York, Chicago, and Boston building laws are too high for dwellings and office buildings, and he suggests that much lower figures should be used for proportioning the metal work, while still using the specified loads in considering the floor arches singly. On the whole, we are inclined to agree with the municipal regulations, which allow a margin for contingencies, and ensure rigidity. Dead loads are, of course, calculated in the usual way, but in skeleton construction the weight of partitions must also be included, as these are carried by the floor beams, and their position is constantly being changed to suit the convenience of tenants, a varying factor that does not occur in this country. Several plans are given in this chapter illustrating typical floor framing in some of the New York and Chicago buildings previously mentioned. A useful paragraph is one pointing out the desirability of arranging a floor plan so that the most economical sections may be employed in girders and beams. Economy can only be attained when the steel is strained to the maximum allowable fibre strain, and if the plan is settled finally in the first instance, without considering alternative steel sections, it will very often happen that girders and joists must be selected giving a considerable excess of strength. Hence we see the necessity of familiarity on the part of the architect with steel construction, as a very small variation of the original arrangement may often save absolutely unnecessary expense.

Another point mentioned by the author, is the inevitable waste of material always occurring towards the ends of heavy rolled beams, where bending moments are at the minimum. Hence, depth should be preferred to weight when beams are being chosen from a section book. It appears that architects in America are frequently content to specify the sizes and weights of the materials to be used, leaving the details of construction to be worked out by the contractor. This is a system upon which we have more than once commented, and we are glad to read in Mr. Freitag's book that "the experienced architect or engineer is not usually satisfied with such license on the part of the contractor." The best class of work can only be ensured when all details have been settled after careful consideration of all the conditions involved, and in our opinion the designer is the only person qualified to appreciate such conditions at their true value. Small details may be left to the contractor, but not the main features of any scheme.

The most essential difference between our own buildings and those now under consideration lies in the treatment of the walls. In this country the common theory is that the walls of a building carry the whole weight, but a frequent practice is that they carry a comparatively small portion of it. Architectural practice has outgrown the London building regulations, but at the present time there seems to be no promise that they will be altered to suit modern conditions. Consequently various anomalies occur and solemn fictions are maintained. It is quite common to find the whole front of a business establishment carried upon a steel girder supported by steel columns, but if, instead of fixing fragile glass windows, an architect were to build a 9 in. brick wall beneath the girder, it would promptly be disallowed. We remember a case that occurred only a few months ago in London, where an architect proposed to build a curtain wall of 9 in. work between two tiers of steelwork. Although absolutely no weight could come upon the new brickwork, the authorities required it to be not less than 14 in. thick, so as to comply with the rules! American building laws are of more elastic nature, providing for safety, yet leaving the architect to choose what type of building he will erect. "Load - supporting" walls are still built in the United States, and they must be of ample thickness. For instance,

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a building carried to the height of sixteen stories would have walls at least 6 ft. thick at the street level. This form of wall is not popular for office buildings in large American cities, because valuable renting space would be sacrificed, and for very high buildings the space occupied by piers would interfere with light, while the weight would add so much to the load per square foot on compressible foundations as to render practically impossible many of the buildings that are required by the public. "Self-supporting" walls are also adopted, in which metal columns carry the tributary floor loads and the roof loads, while the walls support themselves and the spandrels only. In this method, it is important that the masonry shall not touch the columns, or unequal settlement of the two materials will inevitably cause undesirable strains. As the author pointed out in his introductory chapter, the earlier examples of so-called skeleton construction embodied self-supporting walls, but the objections of size and weight led to the adoption of what is termed "veneer construction" walls. As an extreme example of a high building with self-sustaining walls the author mentions the *World* Building, New York, in which the walls (of sandstone, brick, and terra-cotta) increase in thickness from 2 ft. at the top to 11 ft. 2 in. near the bottom, and are then offset to a concrete footing 15 ft. wide. The structure in question is 191 ft. to the main roof, above which is a dome containing six stories—in all a height of 275 ft. above the street. We do not want such buildings in this country, but as the Americans do require them, a lighter type of construction has its advantages. Veneer construction does away with all masonry except as an envelope for the steel frame and for filling spaces below the windows. To use Mr. Freitag's words, "The brick wall, once the fundamental factor in building construction, now fulfills simply a decorative and protective function." As stone does not afford adequate protection against fire it is chiefly used in American buildings for effect, while terra-cotta and brick, which are unsurpassed as fire-resisting materials, are very largely employed. The details concerning exterior walls in this chapter, and those relating to spandrels, spandrel sections, and bay windows in the succeeding chapter will repay examination, and their value is much enhanced by the numerous illustrative sections given by Mr. Freitag.

In Chapter VII. the author endeavours to investigate the more important forms of columns, and to point out the advantages and disadvantages of each one. The inquiry is upon a most interesting subject, and one that is of extreme importance, but the limits of space will not permit us to follow the author in his task. As might be expected, he characterises the use of cast iron in large buildings as a thing of the past among progressive designers, and passes on to illustrate the great variety of steel sections available to the designer of columns and stanchions. The main essentials of column design are very fairly stated by Mr. Freitag. Cost is largely governed by the form of section, and in the case of built-up columns by the amount of workmanship necessary for the production of the form. A hollow section requiring no riveting, and having a uniform radius of gyration in every direction would be theoretically the most economical for use, if it were not for practical considerations. Columns must be of such design as to lend themselves to ready splicing, and it is of much importance that girders and beams should be attached in such manner as to transfer the loads to the centre of the columns. So it may well be that a form of section that is theoretically the strongest and the cheapest will be found neither one nor the other in practice. Taking all things into account, it is found that practical and theoretical conditions are most nearly balanced by the use of rectangular columns, such as those built of *Z*-bars, or of plates and angles, or plates and channels. Fireproof material can be applied to almost any form of section, but the space necessarily existing between the column and its covering has tempted American engineers to run pipes therein. This is a practice that cannot be recommended, and we are pleased to find it discouraged by the author. Pipes ought not to leak, but they sometimes do, and it is a serious mistake to expose steelwork to any risk of oxidising influences. Moreover, pipes ought always to be run in conduits where they can be inspected or repaired at any time.

Probably the heaviest column section ever used in building construction is that to be found in the Waldorf-Astoria Hotel, and it was required for supporting the giant trusses which we briefly described in January, 1901. A section of the column is given by the author, by which it is seen that to obtain the necessary area, ten web-plates, four covers, and twelve angles were used. The load carried was estimated at 5,400,000 lbs., and the weight of the column was 46,980 lbs. Three or four other sections are also given of other large columns, which will be of interest to architects. Three paragraphs dealing with column bases and shoes are of considerable value, and so also are those relating to column loads, sizes, details and splices, and fireproofing. It is satisfactory to notice that Mr. Freitag calls attention to the necessity for considering the effects of eccentric loading, [a subject to which we have recently adverted in our columns. Wind bracing is a subject that scarcely concerns the British architect, and even in the United States it is considered that wind bracing is unnecessary when brick partitions are incorporated with a well-constructed steel frame. In veneer buildings, however, wind bracing is an essential, especially in view of the tornadoes afflicting some parts of America. Our readers should find the examples given of sway, portal, knee, and lattice bracing useful for the purpose of showing how wind pressure may best be resisted. Lattice girders are not largely used in this country by architects, and a short time ago one of our engineering contemporaries made the remark that such girders were never employed in building construction. We may therefore direct special attention to the examples of lattice girders described and to the illustration of the Park-row Building, where twelve stories will be seen to incorporate this form of detail.

As may be gathered from our review, the object of the author has been to start with the load-bearing floor system and to lead down through columns to the foundations, wind bracing being treated as a part of the column design. We come now to the subject of foundations, which is of even more importance to the American than to the British architect, because the former has to distribute enormous concentrated column loads over his site, and at the same time to avoid interference with basement space where mechanical plant is usually "located." The more equable distribution of weight through the walls of buildings as erected in this country does not as a rule call for the special methods necessary in America. In practice, it is found that by the adoption of steel footings, and the distribution of concentrated column loads over the available ground area, the weight of a structure, and consequently its weight, can go on increasing until the footings cover the entire area, within permissible limits. These limits are soon reached with buildings having self-supporting and load-supporting walls, and resting upon ordinary foundations, but the development of skeleton and veneer construction, and of the newer foundation methods render possible the structures which are looked upon in this country as monstrosities. In Chicago, the limit of height has probably been reached, but in New York City the character of the rock foundations and the absence of restriction as to height seems to render possible the erection of buildings even more lofty than those already perpetrated. From the chapter of foundations, it is clear that the municipal authorities of most large American cities are careful that safe limits of bearing pressure shall not be exceeded. Differences in the character of the soil render necessary very different treatment. Thus, in Chicago surface foundations predominate; in Boston, piles are largely used; and in New York, pneumatic foundations to the bed rock are generally found. All these types of foundation are described clearly by the author, and much useful information is given as to the requirements of building laws, and the pressures due to buildings in the chief cities. The chapter on this subject is of considerable length, and is perhaps the most valuable in the whole volume, its usefulness being augmented by the plans and sections illustrating the text. The concluding chapter is occupied by suggestions relative to specifications as to character of materials and workmanship and inspection. Many serviceable hints may be derived from a careful study of this chapter, which is a worthy conclusion to a thoroughly conscientious and interesting volume. Mr. Freitag is largely descriptive, yet he does not anywhere forget the importance of practical detail. In some chapters he purposely omits particulars that may be more conveniently obtained from the section books published by steel manufacturers in the United States, and although he gives some formulas for calculating the strength of beams and columns, his book nowhere assumes the character of a mathematical treatise, and may be read through without the accompaniment of pencil and paper for the purpose of interpretation. For some reasons this is an advantage, as those who wish to work out problems suggested can readily do so by the aid of knowledge already acquired, or to be obtained from any of the available text-books on constructional work.

VICTORIA MEMORIAL, MASHONALAND.—Mashonaland's memorial to Queen Victoria consists of a public library and museum and an assembly-hall, to be erected in Salisbury.

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NOTES.

Architectural Competitions.

THE following proposed additions to the Institute "Suggestions for Architectural Competitions" are down for consideration at the business meeting of the Institute on Monday next:—

"The following paragraph to be inserted in Clause 1:—

The selection of an assessor should be made with the greatest possible care, as the successful result of the competition will depend very largely upon his experience and ability.

Clause 4 to be amended so as to read as follows:—

4. The number, scale, and method of finishing of the required drawings should be distinctly set forth, and they should not be more in number, or to a larger scale, than necessary to clearly explain the design. If the assessor advises that perspective drawings are desirable it should be so stated, and such drawings should be uniform in size, number, mode of colouring, mounting, or framing (if any), &c.

The following to be added to Clause 12:—

It is important that the award of the assessor should be adhered to unless there is some valid objection to the employment of the author of the selected design to carry out the work, as to which the assessor is satisfied. The setting aside of the assessor's award for any other reason constitutes a breach of faith on the part of the promoters."

The first of these propositions is of the kind called "self-evident." The second we entirely approve of, but the difficulty is to get competition committees to consult the assessor in drawing up the conditions, as in many cases they seem to consider it only necessary to seek his assistance in making the selection. The third is open to some comment. It is not wise to attempt to tie down those who are to pay for and use a building to accepting unconditionally the choice of a person not practically interested in the matter. The public are likely to kick against that; and assessors are not, any more than other mortals, infallible. We think that in all cases the committee should bind themselves to award the premiums according to the assessor's judgment; and in general they will be wise to carry out the building to which he gives the first premium. But if, where there are three premiums (as is generally the case), they prefer to carry out the second or third premiated design rather than the first, they ought not to be regarded as breaking faith with the competitors on that account. It is they who are to live in or make use of the building, and they may have good reasons for preferring the second or third to the first premiated design. It ought to be sufficient if they undertake to select one of the premiated designs for execution, though they may very well be advised that they will in most cases be doing best for themselves in taking what the assessor thinks the best plan. Eminent architects who act as assessors are, however, sometimes too apt to choose a design for artistic merit rather than convenience of plan; it should not be so, but it sometimes is. Another point that should be noted is that competing architects are too much inclined to think that the assessor has no duty except to the competitors. They forget that he has a duty to the committee as well.

Local Expenditure.

THE motion of Mr. Balfour, agreed to in the House of Commons without discussion, to appoint a Select Committee to inquire whether any analysis of the public expenditure is possible which will not also involve criticism of the Government's policy, hardly seems likely to produce any satisfactory results, as the questions of national policy and national expenditure are indissolubly connected. The really important subject for inquiry seems to us rather to be the serious increase in local expenditure, and this could be the subject of investigation without any such limitation. The same public attention is not given to local expenditure which is directed to public expenditure; a small increase in the National Debt calls forth a strong remonstrance from the Opposition, yet the local debts roll silently up until we are confronted with an increase of some 183,000,000*l.* in the period between the years 1875 and 1899. The question is a serious one, not only to householders, but to holders of property generally, and as evidence of this the reports of the principal railway and other companies can be referred to, in which the large increases of local taxation are mentioned, and the complaint is put forward that a large portion of this increase is necessitated to enable Municipal Authorities to carry on undertakings of a commercial character in competition with those who have to bear the taxation. An investigation into the cause and character of the local expenditure, how far it has been productive, and how far the increase is justified, would be of considerable use, and public attention should also be drawn to the question whether it is politic for Municipal Authorities to engage in undertakings of a commercial character in competition with private enterprise.

The Efficiency of Glow Lamps.

MR. WEISSMANN, in a paper read at a recent meeting of the Société Française de Physique, described a novel system of electric lighting whereby consumers may effect considerable economies in their meter bills. It is well known that the practical efficiency of glow lamps varies from 3.5 watts per candle for a 100-volt 32 c.-p. lamp to 5 watts per candle for a 5 c.-p. lamp. For lamps at higher pressures the efficiences are considerably smaller. Now, Mr. Weissmann proposes to vary the pressure on the lamps with their candle-power, so that all lamps used may have carbon filaments of the same thickness. He has constructed lamps of 16 c.-p. at 22 volts which take only 1·7 watts per candle when first put in circuit, and after 400 hours still consume less than 2 watts per candle. They, therefore, provide the same light as ordinary lamps at less than half the price. He points out that small transformers can now be made which can easily go in the base of a lamp-fitting, and their efficiency can be guaranteed to be over 85 per cent., and is sometimes as high as 96 per cent. Hence, taking the data given as correct—and we see no reason for doubting them—an economy of about 40 per cent. can be effected by this means. Instead of using one transformer for each lamp, transformers may be used to supply a group of lamps, and so the wiring for them need not be complicated. Fifty candle-power lamps will be run at 110 volts, and ten candle-power lamps at 22 volts. Unfortunately this system cannot be very easily applied to direct current circuits, but there are many cases where it is possible to run several low voltage lamps in series on a high pressure direct current circuit with advantage. There is such a large difference between the cost of light from a high pressure and from a low-pressure lamp that it will well repay electricians to devise methods of utilising the latter in circuits where the pressure of supply is from 200 to 250 volts.

Silent Chain Gear.

WHILE its mechanical advantages are well known, the employment of chain gearing is often thought to be impracticable because of the noise connected with its use, and because of the low speeds usually necessary. The increasing application of electric motors and machinery of various kinds in public and other buildings frequently presents for solution the problem of transmitting power for short distances without undue loss and noise. Sometimes the limits of space may not permit the installation of a direct-connected engine and dynamo, nor give the necessary distance from one machine to the other for belt driving. Ordinary chain suffers from the faults named, and belting would slip. Moreover, when an ordinary chain gear is started, the pins bed in their bearings, the material is stretched, and wear of pins and bearings begins. At the same time, the root diameter of the sprocket-wheel is decreased by wear, and presently the pitch of the chain becomes too great for that of the wheel, so that one tooth may ultimately have to do all the work at any given moment. Then, when one link has left a tooth, the wheel moves back under the load and the tooth strikes against the next pin of the chain causing noise and shock, the latter straining both wheel and chain, and consuming power. In the Renold silent chain gear these disadvantages appear to have been avoided, for the wheel and chain remain a perfect fit each with the other independent of the stretch of the chain. This chain gear has links of peculiar form, bearing on the faces of the teeth, instead of on the root circle, and every tooth in gear remains in equal contact with the chain irrespective of stretch. As there can be no slipping back of the wheel there is little if any noise, and as the strains limiting the speed of ordinary chains do not exist, the gear may be run at high speeds. A self-adjusting chain of the kind must be invaluable when two or more chains have to be run on one wheel, and the life of the chain is the time which it may take to stretch so much that it ceases to bear on the teeth of the wheel.

Sanitary Condition of Darwen.

DR. S. W. WHEATON'S Report to the Local Government Board on the prevalence of diphtheria in the Borough of Darwen, lays stress principally on bad and imperfect sewerage, and on the existence of the pail-closet system. He states, in regard to sewerage, that there is no plan in existence showing the whole of the sewers of the town, with details as to their construction, fall, connexions, and other needful particulars. In many instances sewers have been laid, or extended, without due supervision, so that the advantages accruing from a good fall have been neutralised, and from faulty surveying some of the sewers have been laid without sufficient fall, so that sewage remains in them in an almost stagnant condition. There is no ventilation of the sewers except what is effected by a

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few gratings placed over catchpits or manholes. There are a large number of sewers with dead ends which are unventilated. There are several extensive areas in the town in which the dwellings are sewered by a number of small unventilated branch sewers ending in dead ends and falling into a main sewer which is also unventilated. In regard to excrement disposal, this is principally effected by pail closets, the contents of which are thrown into the sewers through the manholes at various points. The pail closets are very unsatisfactory, and are a cause of much nuisance, being nearly always found in a filthy condition. This is the kind of testimony we nearly always meet with in regard to the results of employing the pail system in towns. The Report notices also, among other points in the town, the frequency with which windows are found that will not open, and adds, "there can be no doubt that from this cause the air in many houses must be very foul."

Incrustation upon St. Paul's.

THE grey incrustation which has formed upon the exterior masonry of the stone gallery of St. Paul's Cathedral has been found on recent examination to be as much as ¾ in. thick in places. Recent analysis of the formation shows its constitution to be as follows: Water, 24·54; carbon, 1·10; calcium sulphate, 59·38; calcium phosphate, 2·22; calcium silicate, 1·63; magnesium silicate, 0.67; iron silicate, 2·40; sand and uncombined silica, 8·06. It appears that the substance is of stalagmitic character, being composed chiefly of calcium sulphate hydrated together with siliceous matter. No one will be surprised at the presence of carbon, as this element is tolerably familiar as a constituent in the atmosphere of the metropolis. The deposit of calcium sulphate is probably due to the absorption by rain of sulphurous and sulphuric fumes from the surrounding chimneys.

Taunton Castle.

TAUNTON CASTLE, of which the great hall, the scene of the "Bloody Assize" of June, 1685, has just been re-instated and repaired, was originally erected for a royal residence in 702 by Ina, King of the West Saxons in 688-728, and burned by his queen Ethelburga after her victory over Eadbricht, King of the South Saxons, who had seized it. Ina's successor, Ethelheard, bestowed the castle and manors of Taunton and Taunton Deane upon St. Swithin's, Winchester. Along the east and south sides of the inner court are remains of the earthworks, with two ramparts, constructed by Ina, against which was erected a wall at the rebuilding of the fortress by Bishop Walkelyn, who also began the rebuilding of his own cathedral, *temp.* William I. The north wall, still marked by its strip buttresses, adjoins the east side of the keep which stands in the western division of the inner court, and measures 50 ft. by 40 ft., the walls being 13 ft. thick; it has a square staircase turret at the north-east angle, and a vaulted basement. At the south-west angle of the west front of the keep is a great circular tower with splayed base, which has been refaced. In the middle of the main south front, 140 ft. in length, is a gate, Early Decorated with Perpendicular additions. In the ruined east gatehouse is the room for working the portcullis and drawbridge, and close by is the chapel. Several Bishops of Winchester, including Giffard, and his successor in the see, Henry of Blois (1129-71) occupied the Castle. At the close of the thirteenth century and beginning of the fourteenth century they built the south front and the round tower. Bishop Langton added the embattled gateway (1493-1501) facing the Castle green, which bears an escutcheon of a cross charged with five roses, and the date "1495," and another of Henry VII.'s coat-arms supported by a dragon and a greyhound. The great hall, measuring 119 ft. by 30 ft., and used until lately for the assize-courts, was built by Bishop Horne in 1577, and repaired and altered in 1785-6 by Sir Benjamin Hammet, M.P., who filled in the moat. Robert Blake having recaptured Taunton from the Marquis of Hertford sustained a memorable siege by Lord Goring until relieved by Fairfax. The castle, dismantled after the Restoration, embraces about 7 acres, and stands upon a gravelly eminence on the right bank of the Tone which flows by its north side. Since 1875 it has formed the headquarters of the Somersetshire Archæological and Natural History Society, who acquired it at an outlay of about 4,330*l.* The Society's museum contains six volumes of sketches in Indian ink by J. & J. G. Buckler, father and son, of architectural remains in the county as they existed in the earlier years of the last century, together with the late J. H. Smyth Pigott's large collection of drawings of Somersetshire churches and domestic architecture. In the *Builder* of August 20, 1892, are two illustrations, by Mr. Roland W. Paul, of the castle courtyard and Thomas Langton's gateway.

The Royal Theatre, Wiesbaden.

THOSE of our readers who may chance to be in Germany within the next few months should not omit to visit Wiesbaden to see the new foyer of the Royal Theatre which was opened by the Kaiser on May 10. It has been carried out from the designs of the City Architect of Wiesbaden, and is, in its own way, one of the most remarkable pieces of architecture connected with theatres that are now to be seen in Europe. In form it is almost a complete rotunda, the entrance being underneath the gallery, from which stairs descend on to the main floor. This gallery is connected with a passage which goes round the entire building, and which is broken by balconies at intervals. The decoration is extremely ornate — in detail too much so — but the general effect is satisfactory. It might be questioned whether it is not to some extent a waste of money to build so magnificent an apartment, since, after all, it can only be used for a few minutes between the acts and at the end of the performance, when an adjacent apartment, known as the blue saloon, is used as a restaurant; at the same time it is agreeable to see a building which is not essentially utilitarian erected without any stinting of money and even with magnificence.

Pictures of Egypt.

AT the Fine Art Society's gallery is a collection of water-colour drawings of scenes in Egypt, by Mr. R. Talbot Kelly, which is of more than ordinary interest. The general views show a great deal of power in conveying the character of Egyptian scenery and the impression of strong sunlight. Among those which are most striking in this sense are "Tel-el-Amarna, on the Upper Nile" (4), with its procession of sailing boats on the calm water; "The Pyramids, from the North" (18), standing as it were amid waves of hot barren sand, over one of which a camel is just appearing; "In the Oasis of Fayoum" (14), a large drawing in which the effect of sunlight is very strongly conveyed, and the composition most effective; and "Pyramids of Gizeh from the Desert" (27), one of the pyramids flecked with the blue shadow of a cloud, as one sees it on the side of a hill, only that in our latitude the shadow is black instead of blue. It is noticeable also that Mr. Kelly knows how to put in the figures in his landscape so as to be just in the right place, and to aid the composition; everywhere the figures are well treated and add to the interest of the scene. Mr. Kelly also depicts architecture very well, as in "The Colossi of Thebes" (34) which may count as architecture in a sense; "Mit Gamr on the Lower Nile" (20); "A Mosque Door, Cairo" (6), and another (32) under the same title, which is still better. One of the most effective of all is "Mastaba Below the Second Pyramid" (26), an erection of colossal stones making a line of blue shadow on the hot sand. Among those in which figures form the prominent subject are "A Pastoral near Damietta" (31) and "Going for Water" (6); the latter a very pretty bit of native Egyptian life. We do not quite understand, however, the architectural picture of "Colonnade in the Temple of Luxor"; those columns are certainly much more slender in proportion than the normal Egyptian column, and we feel inclined to put a query to that rendering. But as a whole this is a collection of drawings showing great artistic talent and close observation.

The Architectural Association Soirée.

THE last Association Soirée, held on June 3 and 4 at St. George's Hall, Langham-place, proved to be fully equal to, if not better than, its predecessors, and the musical play entitled "Arctia, a Legend of the Far North," written by Gervase Bailey, the music being by Leonard Butler, had a most hearty reception from the large and enthusiastic audience of architects and their friends. Mr. G. B. Carvill was stage manager, and is certainly to be congratulated on the whole production of the piece. The vote of thanks to him and the authors, and all who assisted, proposed by Mr. H. T. Hare, the new President, was most warmly responded to, and repeated calls were made for Mr. Carvill and the authors. The former, in a neat little speech, returned thanks for the company and himself, and assured the audience that the players had enjoyed themselves quite as much as had apparently the spectators. The social side of the Architectural Association is, perhaps, shown at its best on these occasions, and no better argument is needed to prove the vitality of the Association and the good work it does in encouraging that *esprit de corps* among its members so essential for the furtherance of its educational aims.

LEEDS VICTORIA MEMORIAL.—Mr. George Frampton, R.A., has been commissioned to execute the monument which is to constitute the Leeds memorial to Queen Victoria, and which is to include a statue of her late Majesty.

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LETTER FROM PARIS.

THE pedestal for the monument being raised in the courtyard of the Opéra to the memory of the late Charles Garnier is nearly terminated. This pedestal, formed of pink Scotch granite, is the design of M. Pascal, architect, the sculptor being M. Denys Puech. The inauguration of the monument will take place next October.

The vote for the medals of honour at the Salon has just taken place. That for the section of Architecture was made under the presidency of M. Daumet, and the medal was awarded to M. Henri Eustache, pupil of M. Ginain, for his large and fine drawings (already referred to in the *Builder*) showing the actual state of the Via Sacra at Rome, and a restoration showing its aspect during the fourth century before Christ. Drawings of a number of Byzantine buildings at Mistra, in Greece, completed the exhibit. First medals were awarded to M. Albert Bruel, pupil of MM. Blondel and Scellier de Gisors, for his drawings of the south-west side of Mount Palatine, at Rome, and to MM. Paul Guadet and Prudent, both pupils of M. Guadet, for their restorations of the Salle Louis built in 1790 in the Palais Royal, and the Theatre Français. Medals of the second class were awarded to MM. Malgras-Delmas, for his Palais de Fervaques, at Saint Quentin; Louis Guinot, for drawings of the exterior and interior of a house at 22, Rue Hamelin, Paris; Emile Brunet, for some careful measured drawings of the choir of Saint Etienne d'Auxerre; and Georges Gromort, for various water-colour sketches of Italian architecture.

M. Eustache, the winner of the medal of honour, has presented his set of drawings to the Académie.

In the section of painting the medal of honour was awarded to M. Joseph Bail, for his picture of an interior scene entitled "Les Dentellières." In sculpture, the medal of honour is carried off by M. Hippolyte Lefebvre, for his group entitled "Jeunes Aveugles." No medal was awarded in the section of engraving, no candidate obtaining a majority of the votes.

Mlle. Marie Pellechet, sister of a late well-known architect of that name, has offered a sum of 12,000*l.* to the Académie in memory of her brother, the interest of which is to be employed for the purpose of preserving any monuments in France or her Colonies presenting an archæological interest. The Académie has accepted this offer.

The Société des Amis des Monuments Parisiens will hold its next meeting this week, and will discuss the various proposals and schemes concerning the embellishment of the ground to be left vacant by the demolishing of the fortifications of Paris; the recent archæological discoveries at the Church of St. Pierre, at Montmartre; and some proposals made by M. Charles Normand to undertake excavations under the Lycée St. Louis for the purpose of bringing to light a second Roman theatre at Paris, and in the Rue des Ecoles in the grounds of the Collége de France, where a Roman monument is known to exist.

The post of Professor of Architecture at the Ecole des Beaux-Arts, left vacant by the death of M. Coquart, was keenly competed for by a number of well-known architects. The majority of votes, however, designated M. E. Bénard, Architecte du Gouvernement and Prix de Rome, and this choice has now been confirmed by the Minister of Public Instruction and Fine Arts.

The work of constructing the third line of the Metropolitan Railway at Paris, from Courcelles to Menilmontant, has just been adjudicated in six contracts amounting to a total sum of 630,000*l.*

M. Fouquian, architect, is preparing the plans of a new theatre to be constructed at Paris on a site comprised between the Restaurant Julien in the Boulevard des Italiens and the Rue Louis le Grand.

On May 16 last a banquet was given at the Palais d'Orsay by the Union Céramique de France to the members of the British Institute of Clayworkers, of whom about forty members were present, presided over by Mr. Collier, President of the Institute.

The thirtieth congress of the Société des Architectes Français opened on the 2nd inst. in the theatre of the Ecole des Beaux Arts. The report of it we defer to next week, in order to treat the proceedings as a whole.

The first stone of the new buildings destined to enlarge the Palais de la Bourse at Paris was officially laid on May 14. A plate of copper, on which was engraved by M. Calvel an enlargement of the plan of the original Palais de la Bourse by Brogniart, was placed in a recess in this stone, and a print drawn from this plate was distributed to each of the members of the Compagnie des Agents de Change.

The Committee of the Salon of Furniture Industries, which will be held in the Grand Palais in July next, has decided to add to the interest of its exhibition by offering awards for the best specimens of artistic advertisement posters connected with such industries. The jury will be composed of artists, amongst whom are MM. Edouard Détaille, Jules Chéret, Dubufe, Léandre, Maignan, Luc Olivier Merson, Steinlen, &c.

The inauguration of the Museum of Decorative Arts in a portion of the Pavilion de Marsan at the Louvre is at present indefinitely adjourned by reason of the unfinished state of the installation, and owing also to a difference which has arisen between M. Redon, the architect to the Louvre, and the committee of the Société des Arts Décoratifs. It is the desire of the latter to maintain in its entirety the large hall situated on the right of the entrance on the Rue de Rivoli, but M. Redon greatly desires to occupy a portion of this hall by a monumental staircase, a feature which appears in the original design by Lefuel, who reconstructed the Palace after its destruction during the Commune. The Pavilion de Marsan was destined as a "Cour des Comptes," and the monumental staircase designed by Lefuel was to occupy the greater portion of this entrance hall. The committee is of opinion that this staircase will take up too much of the useful space, and besides, it does not care to authorise the expenditure of 4,000*l.* which this staircase would cost. A sum of 48,000*l.* has been put aside by the Société for the interior work of arrangement and installation, and 16,000*l.* have already been spent on that portion which it is hoped will shortly be opened to the public.

The Académie des Inscriptions et Belles-Lettres has awarded the Prix Fould, of a value of 200*l.* destined to recompense the best works on the history of the arts up to the end of the seventeenth century, in equal portions to M. George Durand, for his monography of the church of Notre Dame, Cathedral of Amiens, and MM. Koechlin and Marguet de Vasselot for their work on the sculpture at Troyes and in Southern Champagne during the sixteenth century.

M. Bouvard has requested M. Formigé, architect for the promenades of Paris, to study the question of installing the celebrated fountain of Sèvres ware in the grounds of the Galliera Museum, where it will be sufficiently protected at night time. It will be remembered that this fine piece of work was ruthlessly damaged during the Exhibition, and M. Sandier, manager of the Sevres manufactory, has prepared replicas of the damaged portion for re-erecting.

Great complaint is being made concerning the state of the avenues on both sides of the Seine occupied during the Exhibition by the various international buildings and shows, which have now been demolished, while the ground has been left since in an incomplete state of ugliness. M. Bouvard, however, finds it impossible to complete this work until some decision has been come to regarding the transformation of the Champ de Mars, and the sale of the ground bordering on this space, which will give him the credit of about 40,000*l.* necessary to put into hand the complete scheme of arranging the Esplanade des Invalides into a rich garden in the style of those at Versailles, the continuation of these gardens along the quays as far as the Pont des Invalides and the Pont de l'Alma, and the restoration of the fine winter gardens remaining over from the Exposition on the Cours la Reine.

The chief portions of the buildings of the Museum of Natural History at Paris are rapidly falling into ruin, and require immediate restoration and the construction of new buildings. A credit of 480,000*l.* is estimated as necessary for this work; it is intended to complete the fine galleries of comparative anatomy and to build a new pavilion for botany. The zoological galleries on the Rue Geoffroy St. Hilaire will also be enlarged and the old galleries demolished. The galleries occupied by wild animals will also require complete reconstruction. Parliament has been asked for the necessary credit, and M. Blavette, the architect entrusted with the work, is about to visit and study the most important of the zoological establishments in Europe.

One of the artistic events of last week was the sale of the collection of modern pictures made by M. Georges Lutz, an amateur of great judgment. Many of his pictures went for high prices. Corot's "Lac de Garde" sold for 231,000 fr., his "Matin" for 95,000, and Rousseau's "Bord de l'Oise" for 54,900. Boilly's "La Distribution des Vivres aux Champs Elysées" was bought by the Paris Service des Beaux-Arts for 30,000 fr., to be placed in the future museum at the Petit Palais. The total results of the two days' sale, at the Georges Petit Gallery, amounted to 1,811,649 fr.

At the Institut the Prix Frémont and the Prix Deschaumes have been awarded. The former, founded for painters and sculptors, has been divided between a young painter, M. Guétin, and a sculptor, M. Larrivée. The special object of the Prix Deschaumes was to distinguish young architects who had combined artistic talent with domestic virtues and devotion to their parents (whether the young French architect is supposed to stand particularly in need of encouragement in these "vertus familiales" we do not gather); the prize was awarded to M. Wielowski, a pupil of M. Laloux.

The French journals have rather too prematurely announced that the monument to Jules Simon, by M. Puech, was to replace, on the Place de la Madeleine, one of the two fountains to right and left of the Rue Royale. The operations for making the change were indeed commenced, but the inhabitants of the quarter protested strongly against the removal of one of Davioud's fountains, and were supported by the "Vieux Paris" Committee, which has made a point of protesting against unnecessary alterations of any of the existing monumental decorations of Paris; and in deference to this double representation the administration have for the present, at all events, suspended the work. The question will however come up again before the Municipal Council, which may insist on proceeding, as it is only too apt to place political considerations before those of art.

The Government has decided to accept the museum left to it by Gustave Moreau, being partly moved to this decision by the liberality of M. Henri Rupp, an old friend of Moreau and his "legataire universel," who has endowed the museum with the sum of 470,000 fr. to furnish the revenue necessary for its maintenance.

The centenary of the Hospital Schools has just been celebrated, and this event, though purely scientific in its general bearings, has been the occasion also of an artistic manifestation, M. Puech having been commissioned to celebrate the occasion by the production of a bas-relief representing a clinical consultation in the surgical ward, while the Government have engaged M. Bottée to design a commemorative] medal. This represents, on the principal face, a young medical student working under the direction of a figure representing "Médecine"; and on the reverse is a figure representing the City of Paris, bending over a young doctor who supports the head of the invalid. On the background is seen Notre Dame, and more distant, the portico of the old Ecole de Médecine.

The monument to Daudet, by M. Saint-Marceaux, was inaugurated last Saturday, in the part of the Champs Elysées bordering on the Avenue Gabriel. The precedent is regarded by many Parisians as rather a doubtful one, which, if followed up in other cases, will tend to make of the Avenue des Champs Elysées a kind of necropolis. Apart from that, there can be nothing but praise for the work itself. The sculptor has represented the great novelist with the rather sad and invalid expression which characterised him during the latter years of his life. The figure is seated, with a cloak drawn over the knees.

M. Sauvageot, the architect in charge of the restoration of the church of Saint-Pierre at Montmartre, has discovered on the site some interesting fragments of mediæval tombstones, and also the tombs of two abbesses of Montmartre, dated 1280 and 1317, sculptured with their effigies.

M. Mercié, who produced the fine group which decorates the monument to Louis Philippe in the Chapelle de Dreux, has received from the Duc de Chartres a commission for a monument, in the same chapel, to his son,

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Prince Henri d'Orléans, who died recently during a tour in the far East. The sculptor has completed the model for this monument, which represents the young explorer as if on his death bed, and casting a last look on the plans and maps before him. The completed work will probably be seen in next year's salon.

The unaccountable disappearance of M. Captier, the sculptor, has been a disturbing event in the artistic world. It is suspected that he has committed suicide. After having made his will and written several farewell letters, the unfortunate artist disappeared from his home and has left no trace of his whereabouts. Captier was a pupil of Dumont and of Bonnassieux, and had received medals in the Salons of 1869, 1872, and 1889, and at the exhibition of 1900. He is the author of several good works, and this year he had exhibited at the Salon a "Venus Anadyomene" in marble. He was well off and enjoyed a good reputation in every way, and his mysterious conduct is attributed to mental aberration.

THE WESTMINSTER DORMITORY.*

BY ARTHUR STRATTON, A.R.I.B.A.

THIS building as it stands to-day, in the quiet secluded spot almost within the shadow of the Abbey of St. Peter, has not, as one might expect, escaped molestation; indeed, at every period, from its original inception almost to the present day, it has been exceptionally maltreated. Whilst the outcome of this is, naturally enough, an impoverished architectural work, yet it has been the means of investing the building itself with no slight historical and antiquarian value, quite apart from that which it inevitably enjoys through its association with so many distinguished scholars and statesmen who have lived and worked within its walls during their sojourn in the celebrated Westminster School.

To trace its history from the internal evidence of the architectural character of the work itself, and from records hidden away in the keeping of various authorities, has been an undertaking of considerable difficulty and magnitude, although full of interest and value.

In the first place we are struck with the succession of disputes and contentions which attended the building of the structure under consideration. Such hindrances are only too common nowadays; but even in the early part of the eighteenth century we find that architects of renown were not spared the mortification of seeing their schemes altered and spoilt, or even thrown over altogether for lack of funds to carry them out. As we shall see, this dormitory, when eventually completed in or about 1733, was little more than a very thinned down version of the original schemes prepared for it; and yet again in our own time, it has been so "restored" and "improved" that almost all that vested it with the true spirit of design has been done out of it.

To show what these original designs were, and to compare them with the building as it now stands, is an object-lesson of first-rate interest to the student of architecture and to the antiquarian alike, and forms a fitting subject for this bursary, which is intended to promote the study of such eighteenth century examples, and to preserve and to put in order any records bearing upon their past and present conditions.

A dormitory has always been required for the use of the scholars of Westminster School, and a mediæval structure once stood upon or near to the site of the present building. Of this nothing remains. Nor have we been able to find any trace of it or reference to it, except in certain entries of the Chapter House records.

From these records we learn that in 1708 Sir Edward Hannes left 1,000*l.* to be employed in the erection of a building for the use of the King's forty scholars, as directed by the Dean and Chapter, "in contriving whereof Sir Christopher Wren should be consulted." It was not till 1711 that any definite steps were taken, and then Sir Christopher Wren drew up a report to the effect that this sum of money had better be spent upon repairing the old building then in use, as he did not consider it to be enough to build and equip a new one. He did not, therefore, at this stage make any original design, and the matter lapsed for a while.

An interval of two years then followed, during which nothing apparently was done.

The scheme must, nevertheless, have been occupying attention, for on April 23, 1713, it was ordered* "That Mr. Dickenson, by the direction of Sir Christopher Wren, draw up a full and exact account of what work is necessary to be done at the College chambers, and to fix the estimates of such particular articles as shall be laid before the Dean and Chapter, that the price of the work may be fixed, and proper workmen, approved by Sir Christopher Wren, enter into such contracts as shall render this charge certain."

The saving clause, "provided it can be done by Sir E. Hannes' legacy and other contributions without burdening the College with the expense of it" seems again to have brought matters to a standstill, for we hear nothing more of the project for five years, although without doubt all the time strenuous efforts were being made towards the erection of an entirely new dormitory.

At last, in 1718, a definite move was made and an entry in the Records at that time tersely refers to the tardy progress made in the preceding five years in the following words:—"On the 7th of January, 1713, the Dean and Chapter, upon a prospect of contributions, as is now said, made an order for the building of a new Dormitory in the College Orchard or Garden, which order notwithstanding this prospect, slept in the Chapter-book five years till it was quite forgotten."

The authorities, however, in 1718, seem to have quite determined that a new Dormitory was necessary, and that funds should be raised to erect it; so on December 8, 1718, the Crown was petitioned for aid in defraying the expense.

The entry recording this is quickly followed by another dated December 20, 1718, to the effect that donations of 1,000*l.* from the King and 500*l.* from the Prince of Wales had been received.

In the meantime, Sir Christopher Wren had been preparing designs, some of which, dated January 17, 1718-19, are preserved in the All Souls' Collection, Oxford.

It was finally settled in June, 1719, that the new Dormitory should be begun, and immediately after the order to proceed was obtained, the scholars were removed from the old Dormitory and taken to Chiswick.

At this juncture all difficulties had been apparently overcome; nevertheless the most serious opposition was made to the execution of the scheme from a very unexpected quarter.

The head master at that time, one Dr. Friend, as the outcome of a dispute as to the site of the new building, brought an action against the Dean and Chapter, seeking for an injunction to restrain the building, on the plea that it would encroach upon his ground and block out his views to a very serious extent. As far as can be ascertained this same Dr. Friend had approved of the site in the years immediately preceding this strange course of action. He brought such weight to bear, however, that a lawsuit necessarily followed, and this, again, not merely occasioned long delay but swallowed up funds, and, worst of all, led to wholesale alterations in the plan and design of the building, much to its detriment and our irreparable loss.

After years of dispute, finally the Dean and Chapter decided to build on the site chosen long since, with due regard to Dr. Friend's stipulations.

The actual work seems to have been in progress during the year 1723. From this period building operations must have been conducted by other hands than those originally intended, and that at the most critical juncture as regards the architectural merits and demerits.

Too much stress can hardly be laid upon this fact, for henceforth Wren's dormitory was no longer Wren's; the design was no longer his; with the execution of it he had nothing whatever to do. In spite of this the building as it stands is frequently spoken of as a work of Wren's and judged accordingly.

One of the principal objects of this monograph is to ascribe the various parts of the work, as far as now possible, to the right authors. It is evident that Sir Christopher Wren's design (fig. 1) made in 1718-1719 was never carried out. He died in 1723, the year in which apparently building operations commenced.

This design presents a most dignified façade seventeen bays in length, the three central ones being set forward slightly between rusticated pilasters corresponding with those at the two extremities; the arcade to the ground story is open and continuous, whilst the centre of the whole façade and of each wing is accentuated by connecting the main windows with the circular wreathed openings above, which take the place of the square attic windows forming part of the composition of the other bays.

This design must have passed into other hands, for in the King's Collection of Maps and Drawings in the British Museum there is a drawing of a design inscribed, "In Usum Alumnorum Scholæ Regiæ Westmonasteriensis," obviously based upon it, but still with such alterations as suffice to take away the broad reticent character which Wren so infused into his. It shows (fig. 2) the same disposition and number of bays, but the parapet and main cornice are broken forward at intervals, and the former is given a circular curve in the centre of the façade. The circular wreathed openings disappear, and are replaced by rather clumsy windows; indeed, the whole front has suffered and after Wren's design looks course and commonplace. It is exceedingly difficult to say for what purpose or under whose instructions this drawing was made, but it is valuable as a link in the chain of evidence, and prepares one for subsequent developments. It is signed only with the name of J. Kip, sculp.

The Earl of Burlington (1695-1753) next appears in connexion with the work. On January 1, 1723, the following important entry is recorded: "Resolved that Dr. Brodrick do wait on the Right Honourable the Earl of Burlington, and in the name of the Dean and Chapter return their humble thanks to his Lordship for the care and trouble he has already taken in building the College Dormitory, and desire his Lordship that he would be pleased to proceed with the same according to his Lordship's plan.

Henceforth Burlington is openly accredited with the design, and in Kent's volume of designs by Inigo Jones it is boldly assigned to him. The plate (vol. ii., plate 51) is inscribed as follows: "Plan de l'arcade et façade du dortoir à Westminster désigné par le Comte de Burlington: l'arcade est de 18 pieds de haut, et au dessus il y a une grande chambre pour les garçons élevés par le roi, qui est de 26 pieds de haut; le dedans de laquelle est maintenant finis tout à fait différent du premier dessein, avec un escalier irrégulier au bout, par une autre main." The drawing is signed "Burlington, architectus," and "H. Fitcroft, del."

Whether Burlington acted as architect in the manner claimed above, or, as is more probable, simply in the capacity of "chairman of a building committee," as Mr. R. Blomfield* suggests, it is certain that he or his committee tampered with the design sufficiently to eliminate the principal points of interest and to leave it decidedly tame and monotonous, though not by any means lacking in force and dignity. He omitted two entire bays, thus reducing the façade to fifteen bays in length, and omitted also the central break which so helped the composition; and the building at the end, shown on both the original designs (figs. 1 and 2) to contain the staircases, also disappeared. There is no doubt but that the lawsuit and the resulting restrictions and impoverished funds were largely accountable at this stage for the mutilation of Wren's design.

The building, as carried out, is shown in the print in Kent's work above referred to. In the absence of evidence to show that the niches were ever occupied by statues, as obviously was the intention, and as they are shown in this print, we are inclined to think that they were never placed there.

In the measured drawings accompanying this Report (see lithographs) the building is shown accurately to scale as it must have left the builder's hands, but not quite as it stands to-day, on account of subsequent alterations.

On January 17, 1846, it is recorded "that the Dean and Chapter having ascertained that the present dormitory was built more than a century ago by subscriptions of persons educated at Westminster, in addition to large grants from the Crown and Parliament, have thought it reasonable to appeal again to the Crown and to old Westminsters of the present time for

* This Report, with the accompanying drawings, forms the first monograph executed under the conditions of the Banister Fletcher Bursary which is awarded in connexion with the Architectural Association, London.

* For access to the Chapter House Records I am indebted to the courtesy of Dr. Rutherford, the then Headmaster.

* "Renaissance Architecture in England," vol. ii., p. 226.

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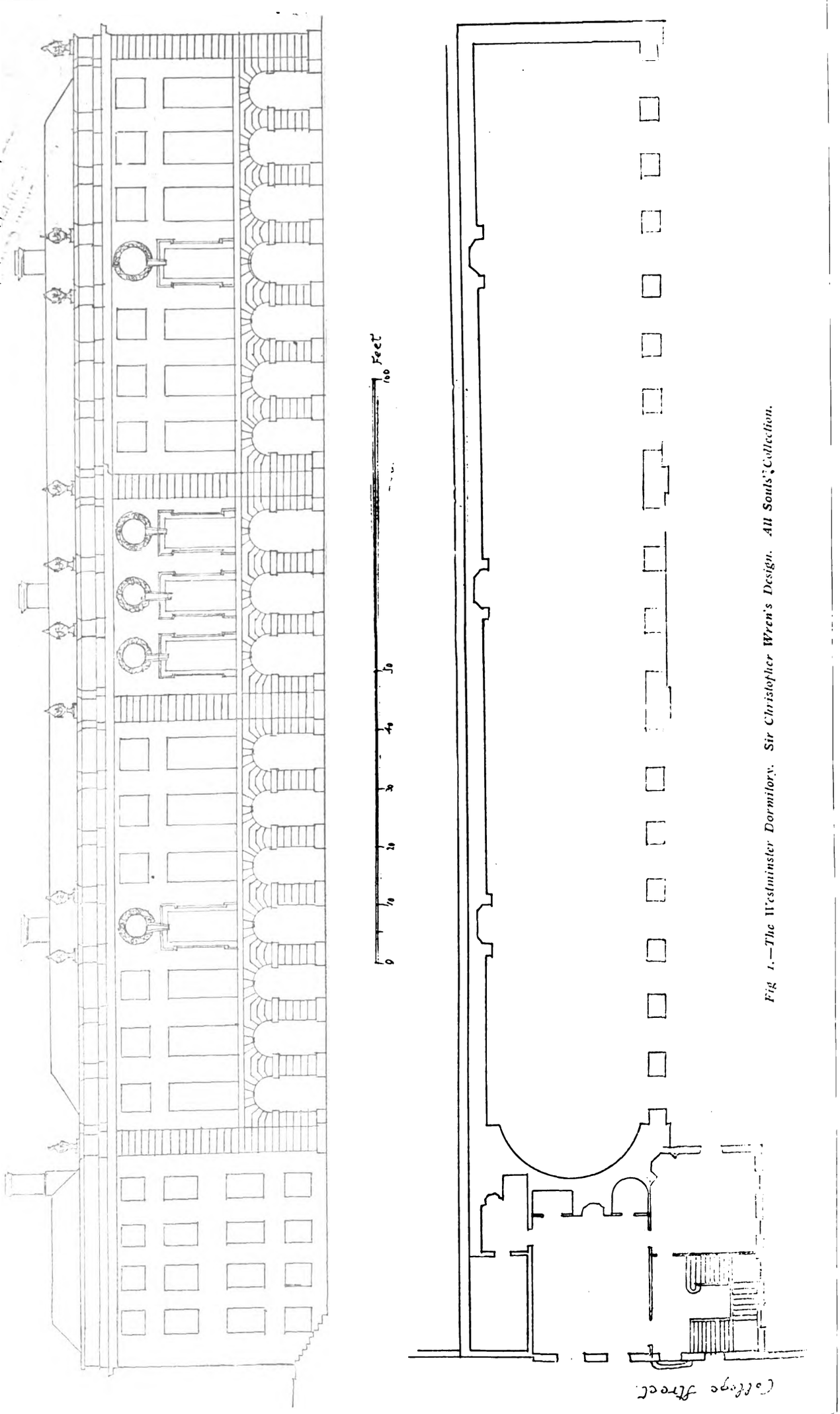

Fig. 1.—The Westminster Dormitory. Sir Christopher Wren's Design. All Souls' College.

DEPARTMENT OF
LAWRENCE

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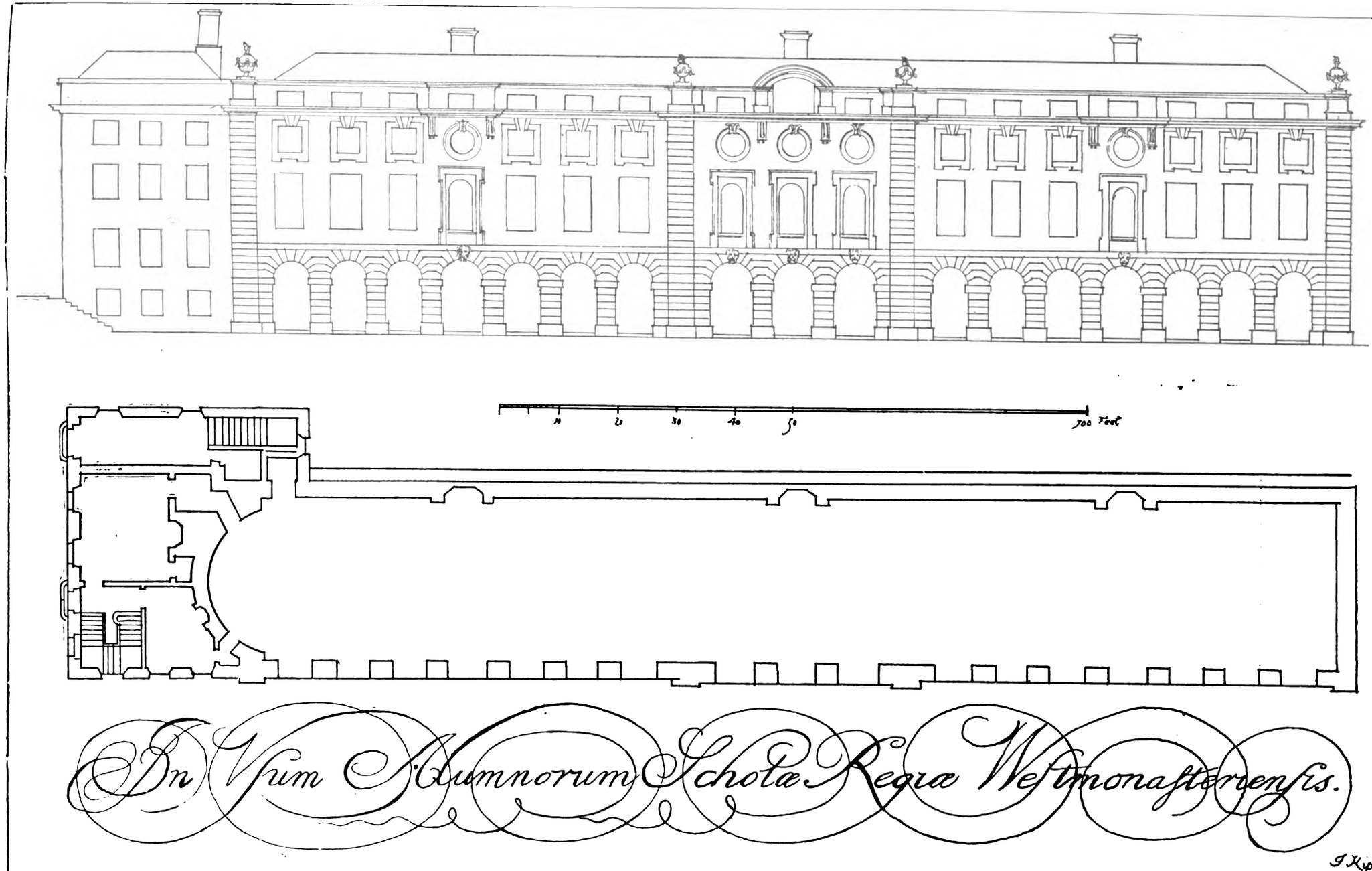

Fig. 2.—The Westminster Dormitory: From a Drawing in the British Museum.

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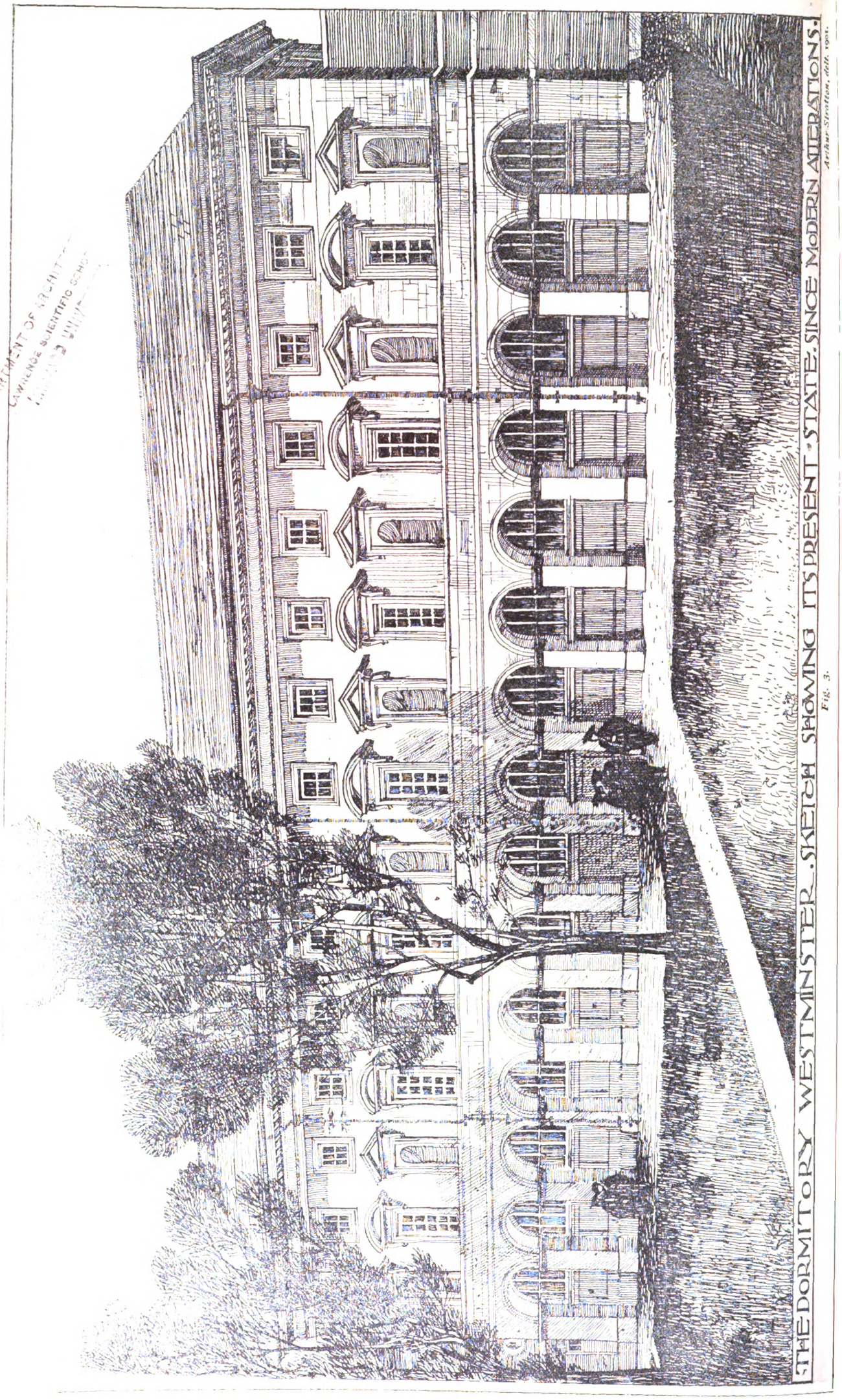

THE DORMITORY WESTMINSTER.—SKETCH SHOWING ITS PRESENT STATE, SINCE MODERN ALTERATIONS.

Arthur Stratton, delt. 1901.

Fig. 3.

DEPARTMENT OF ARCHITECTURE
LAWRENCE SCIENTIFIC SCHOOL

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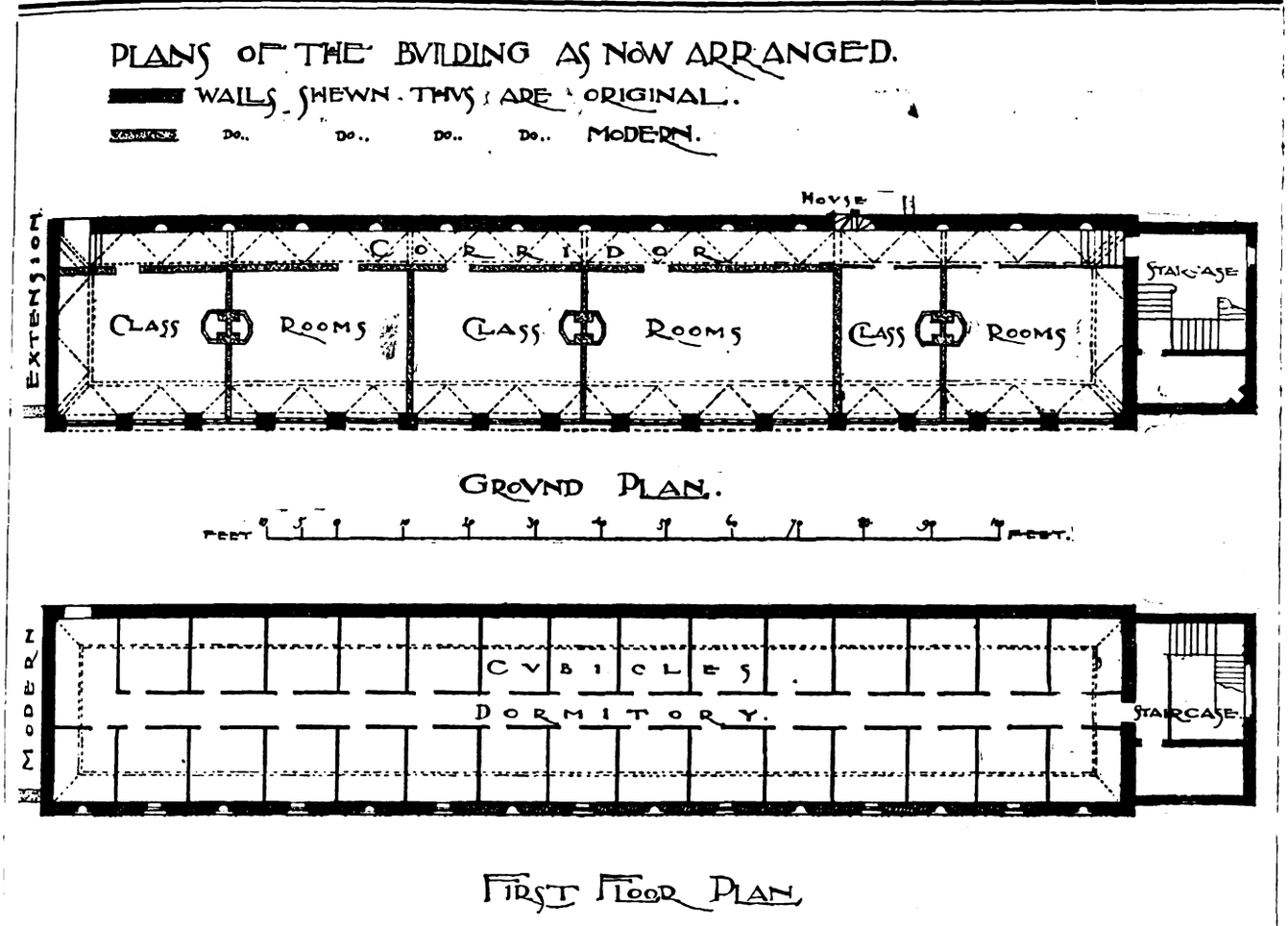

Fig. 3.

their aid to render more accordant with modern manners the building which has hitherto with much inconvenience been applied to the manifold purposes of a study and dormitory." As a result of this appeal the lower arcade of fifteen bays, which had always been open, and was always intended to remain so, was filled in with masonry and glazing as is shown in the two end bays of the measured drawings and in the perspective sketch in this Report (fig. 3). The large apartment thus obtained was at the same time divided up by cross and longitudinal walls, as shown in the plan (fig. 4), forming in all eight class-rooms. These cross walls cut into the centre of some of the bays, and cut the groined cove without any regard for the continuity of the design. This modification is much to be deplored. The cove to the ceiling, all of white plaster, is one of the most striking features of the whole building, and the succession of intersecting surfaces, with the play of light and shade upon them, must have been very striking when seen uninterruptedly. The detail of it is quite simple and skilfully designed. It consists of a quadrant cove intersected by circular vaults of the same diameter, the resulting intersection being a true curve, out of winding, making angles of 45 deg. on plan, as shown on the measured drawings. The longitudinal wall forming the corridor which was set up at the same time as the cross walls (see fig. 4) is placed beneath the soffit A; this forms a true cornice on the classroom side, and accordingly has scarcely the appearance of a makeshift.

Between the years 1847-50 the existing matron's house was built as an annex to the south of the dormitory. This is an important point, for it corroborates other evidence to the effect that the building shown on both the original designs (figs. 1 and 2) and containing the staircase, was never erected.

In the King's collection of maps and drawings in the British Museum, before referred to, there is a sketch distinctly showing the dormitory and other buildings in the immediate vicinity, with the Abbey in the background. This shows the building quite correctly from an antiquarian point of view, but the actual draughtsmanship is bad. It is signed by W. Courtenay and is dated 1758. From this it is quite certain that no building was then standing where the present matron's house stands, and where the staircase block was meant by Wren to be erected. The staircase to the dormitory on the first floor seems always to have been contained in the low adjunct to the north built of brick, with stone quoins (see measured drawings). Of the original stairs not a vestige remains, and it is difficult to conjecture what form they took.

On June 12, 1733, it was ordered "that the staircase in the new dormitory, the chimney-pieces, and slabs there wanted, and the paving of the cloyster under it be also carried on and finished by direction of the Committee." In all probability a wooden staircase led up to the doorway A (see plans) in much the same manner as the existing stone one. But this latter only dates from the 1846 alterations, and is not in any sense worthy of the building; it is partly carried on iron joists; the iron balustrade and the handrail is of the poorest description. It will be remembered that the staircase is not claimed for Burlington in Kent's "Inigo Jones" (see *ante*).

It yet remained for one of the most disastrous "improvements" to be made in 1895. The long, lofty apartment on the first floor, which had always been used as a sleeping apartment for the scholars, was considered to be ill-lighted and ventilated with only a single range of windows high up. It was accordingly decided, on the advice of Mr. T. G. Jackson, R.A., to cut through the alternate niches and to insert casement windows. This, together with the filling in of the arcade below, which was always intended to be open, has done much to detract from the architectural merit of the building. The new windows look particularly unfortunate, owing to the double reveal occasioned by the conversion of the niches. At the same time the roof was slated and new gutters were added, but the main timbers of the roof trusses, rafters, ceilings, joists, &c., are still the original, and are of English oak.

The façade is entirely of stone, but instead of Portland stone which Wren intended, Bath, or some similar stone, was employed, which is not so well suited to the London atmosphere; it has not weathered with the silvery hues which give such a charm to Wren's Portland stone buildings, but has simply taken a dirty black tone, whilst the surface has in places succumbed to the inroads of the chemicals which are so destructive in London, and frequent patchings with new stones are noticeable. The enrichments and cornices, jamb and arch members, are everywhere vigorously carved and add considerably to the interest of the work.

In spite of such a chequered career, this building has not lost all its fascination; possibly Mr. Loftie was not over enthusiastic when he wrote in 1893, "There is certainly nothing in English architecture more quietly beautiful than the elevation of the Westminster Dormitory." A façade some 166 ft. in length, and 50 ft. in height, consisting of a repetition of a simple well-designed bay, cannot fail to be dignified and reposeful.

Without doubt the filling-in of the arcade struck at the root of the whole design and destroyed its *motif*, whilst the sacrifice of the niches to modern requirements in the form of windows, again destroyed much of the character of the building.

The whole history is interesting and valuable, and cannot fail to impress the architect. It is a splendid example of the limitations and restrictions which dog his footsteps at every turn, and over which he frequently has no control, albeit his work suffers. To strive after the monumental and the large conception should be our constant aim, but it is useless to ignore the fact that houses are built to live in, and not merely to be looked at.

SILCHESTER.

THE annual exhibition of objects of interest found during the past year in connexion with the excavations on the site of the Roman town of Silchester, not far from Reading, is being held in the meeting room of the Society of Antiquaries at Burlington House, and will remain open until and including Tuesday next. Two *insulæ* have been explored (Nos. xxii and xxvii on the plan exhibited) in the northern half of the town, the area being partly enclosed by the outer wall. In the latter of the two *insulæ* remains of three houses were found, two of considerable size, and bearing interesting evidence of extension subsequent to their first erection. Several tessellated pavements were unearthed, two of which were found in sufficiently good condition for preserva-

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tion and removal. A large portion of one of these is exhibited, and others are illustrated by carefully coloured drawings to scale by Mr. Geo. E. Fox, F.S.A. On the site of one of these houses interesting traces were discovered of the half-timbered upper story. The clay of which the filling-in was composed had been hardened by fire, thus retaining the impression of the pattern originally stamped on the face, and also the impression produced by the laths and woodwork at the back and sides. A curious parallel instance is shown from a book illustrating an example from the Continent. Other architectural fragments include a portion of a sculptured stone, supposed to be the head of a niche, the remaining spandrel filled with a representation of a figure, while the soffit has a conventional leaf ornament repeated at intervals. At one end is also a trace of a conventional foliage pattern. Another fragment is said to be that of a finial.

Among the other finds is a quantity of pottery, one with a cock in slight relief, another with a running deer, a third has a number of letters incised, the meaning of which, however, has not been deciphered. Several objects in pewter are shown in remarkably good preservation—a jug, a flanged bowl, and a bucket. In connexion with the last-named is a large iron hook into which a wooden handle or pole has been fixed; perhaps used for lowering the bucket into a well. A collection of various articles of small size has been made, brooches, pins (of iron and wood), coins, fragments of delicate glass vessels (one with a fish, another with lettering), also many iron implements, including two good examples of wheel tyres, interesting pieces of painted plaster from the walls, and additions to the number of seeds of fruits and plants already found in the pits and identified.

During the present season work is being continued, the part chosen being at the eastern end of the town, near the present Parish Church, and the site of two temples already discovered, and illustrated in these columns. The result of this year's work should, therefore, not in any sense be of less interest than the results already obtained in former years. A large portion of the site has now been examined, and with helping funds we shall soon have a highly interesting and fairly complete plan of a Roman city. The pavements and various objects of interest found are all being deposited in the museum at Reading, which should be seen by all interested in the subject, bearing as it does the same relation to Silchester as the museum at Naples does to the ruins of Pompeii.

THE ORIGIN AND SYMBOLISM OF CHURCH ORNAMENTS.

THE Rev. J. Hermitage Armstrong presided on Wednesday, the 28th ult., at the Church House, Dean's-yard, S.W., over the annual general meeting of the Church Crafts League. At the commencement of the proceedings the chairman congratulated the League on the very successful exhibition which they had had during the past month in the Church House, and remarked that although the exhibition had evoked some criticism, yet it was something even to get criticism.

Canon Rhodes Bristow opened a discussion on "The Origin and Symbolism of Church Ornaments," and referred first to the lights which adorned the altar and the sanctuary, which were amongst the chief ornaments of the church. He said that while no doubt the origin of lights in churches was to enable people to see, yet at the same time they were symbolical of joy and gladness and particularly with regard to the two lights on the altar they represented the two-fold nature of the Light of the World. With respect to incense again, it was probable that it was used in the first place for fumigation, but there was also a symbolism attached to its use—it was symbolic of the fervent love which inspired prayer. Then again as to pictures and sculptures and images. Doubtless these were used first to cover blank spaces in the walls, but they had the further use of bringing things clearly before the eye, which sank into the heart. Thus, although the origin of all these things may have been in their primitive usefulness, yet the church had recognised in them opportunities of helpfulness in driving home great truths and art came to be recognised as being of great value in these departments.

Mr. Stirling Lee said the study of symbolic language was one of the most interesting of studies. From the very earliest times they found the highest thoughts expressed in symbols. Going back to the early Egyptians, they found the crocodile deified, and when they inquired why, they found the crocodile could see through the muddy waters of the Nile, and was a tongueless animal, and consequently it was taken as symbolic of the all-seeing eye of God and the voiceless God. In the times of the early Greeks the same symbolic language was found, and on the walls of the temples were expressed the highest of thoughts. The same thing occurred with the Hebrews, who were of a highly poetic nature, and largely used symbols to illustrate the mystic and the unseen God. They found this in the building of the Tabernacle. One instance was the wrought metal altar—which he would like to see used in churches now—which was symbolic of the unity of the tribes of Israel. Then with regard to the Church, they had still to look for the same symbolic meanings. First was the Church in the Upper Room, and then the basilica was built, where very simple forms were used. The church grew, and in the Gothic churches they got back almost to the Tabernacle again, with its three divisions. There was the symbol of the nave, for the ship—*navis*—the ark come back. There was the chancel with the screen. The screen was symbolic of the drawing back of the veil, and where there was no screen there was no symbolic meaning. It was the dividing line for the Holy of Holies, and therefore the screen became one of the greatest things the artist had to do, and it was in the screen they gave expression to their highest thoughts. It was through that screen that entrance was made to the Holy of Holies—the veil was rent that man might approach the altar. So in the early days the screens became the finest objects of art in the cathedrals. Then they found the sacrificial altar developed into the altar, and above the altar was the reredos on which the artists illustrated their thoughts when before the altar-table itself. So they got the three parts of the church, and it was interesting to the architect to know when he started a church what his symbolism was; to know what he meant to illustrate, for he took his construction by his symbolism, and to him it was a living thing. He was going to build every part intelligently with meaning, and as every part of the tabernacle in the wilderness had meaning, so he built the church with absolute symbolic meaning. Coming first into the church was the font, which was a very beautiful thing for the sculptor to illustrate, for here was the source which was going to flow through the Church, the spring going to flow into the great sea. The one ornament of the church which changed every Sunday was the flowers on the altar, and these flowers were full of symbolic meaning to everyone who observed.

Replying to a question, Canon Rhodes Bristow said that apart from its symbolic meaning, he had little doubt but that incense was used as a disinfectant by the Hebrews.

The Chairman observed that he was reading some old service books of the time of Edward VI. and found prayers authorised to be used in the times of certain sickness and the priest was ordered first to use some kind of fumigation.

Mr. Dyer Edwardes thought the use of incense went back to very early times. He had a censer used in the early Coptic Church which he brought from Egypt, and they saw it depicted on the early Egyptian monuments. He would give an example of how a structure could become the symbol of character. He had been to the Escurial at Madrid. They knew that Philip II. as an old man became extremely melancholy and he looked about for some place where he could pass his days in meditation and prayer. The site of the Escurial was extremely gloomy and severe, and, in fact, a more austere spot could scarcely have been found. If they took away the cupola which surmounted the great church and the towers at the four corners they could imagine it a barracks. It was a mixture of palace and convent and great church. It was built of granite, and the moment one passed through the door one felt a chill pass through one. There was nothing beautiful; but he could not say there was nothing elevating, because the great church was one of the most impressive structures he had ever been in. The whole construction of the Escurial was symbolical of the mind of Philip II.

Mr. Frith said that Mr. Lee had referred to the noble and elevated thoughts which symbols gave rise to in the minds of those who understood them and felt their power. He thought that condition on the part of worshippers was very much to be encouraged.

The Rev. E. W. Hines said he had been struck in looking round churches with the fact that individualism on the part of workers might be more encouraged. He knew a church built in modern times, but there were only representations of two figures in the whole of the thirty or forty corbels. They were repeated all round the church in a monotonous manner. He thought they should encourage a little more effort and a little more individuality in this direction. He would also like to know whether there was any representation of Christ on the crucifix, not in his agony, but robed and crowned.

Canon Bristow said there was a very fine specimen in the Church of St. Mary, Bathwick, near Bath.

The Chairman said he did not altogether agree with Mr. Lee as to the origin of some of the ornaments. For instance, in the fifth and sixth century in the Roman Church the clergy wore no distinctive dress, but only the dress worn by persons in high places. Well, that Church was very conservative—and he thought it was probable that the clergy clung to their dresses, and as these dresses got out of fashion amongst the laity, they began, in the eyes of the people, to assume a distinctive form, and, in course of time, their origin was forgotten. Then the artistic mind came in and suggested that there was a sacred meaning in the robes to those who had eyes to see it. That was what it seemed to him in a large number of cases actually happened, and he thought they were much indebted to the artistic mind for helping them in those interpretations.

Mr. Lee said he did not touch on clerical robes, but he did say they were symbolical in the early church. Nothing surely could be clearer than the way in which the robes of the High Priest were ordered, and every part of that robe was symbolical.

The discussion closed with a vote of thanks to the chairman.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A HOME counties district meeting of the members of the Association of Municipal and County Engineers was held at the Town Hall, Newbury, on Saturday, May 31. Mr. E. G. Mawbey (Leicester), *President*, occupied the chair, and there were present Messrs. W. Weaver (Kensington), W. N. Blair (St. Pancras), P. G. Kellick (Finsbury), W. Harper (Cardiff), J. Lemon (Southampton), R. J. Thomas (Aylesbury), W. Banks (Rochester), A. J. Dickinson (Long Crendon), T. H. Pollard (Windsor), G. Fitton (Basingstoke), T. J. Guilbert (Guernsey), and others.

The Mayor (Alderman J. Rankin, J.P.) received the members, and said the municipalities much appreciated the services of their municipal engineers, who assisted them so much in the carrying out of those important schemes which were necessary for the health of the community.

The President moved a vote of thanks to the Mayor for his reception of the Association, which was accorded with acclamation.

Mr. S. J. L. Vincent, Borough Surveyor, read a paper on "Newbury Municipal Work." He said the population was 11,000 and the rateable value 40,500*l*. There were 7¼ miles of main roads in the borough (the Berkshire County Council contributing 1,250*l*. per annum), and about 11 miles of streets and roads other than main roads. For the main roads, Clee Hill granite, broken to 1½ in. gauge was use, the roller being a 10-ton Aveling & Porter. For the other streets and roads, local gravel, hand-picked flints, and Sarson stone were used. In June, 1900, the roadway on two sides of the municipal buildings was paved with Karri blocks on a bed of Portland cement concrete 9 in. thick gauged 5 gravel to 1 cement; area 474 yards, cost 300*l*. During the last three years about 12,000 yards super of concrete footways had been laid, at an average cost of 3s. 4d. per yard superficial. The footways were laid *in situ*, the thickness being 2¾ in., the bottom 1¾ in. being compose of 4 parts local shingle gravel (¾ in. gauge) to 1 part Portland cement; and the top

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1 in. 2 parts fine beach shingle (¾ in. gauge) to 1 part Portland cement. The main sewerage system of the borough was designed by the late John Anstie, and carried out by him during 1894, 1895, and 1896. It was entirely on the "separate" principle. There were 13 miles 2 furlongs of sewers. The main sewer at the receiving well was 16 in. in diameter, the other sewers ranging from 12 in. to 8 in. The whole of the sewage flowed by gravitation to the receiving well at the pumping station, whence it was pumped by three 7-in. centrifugal pumps to the outfall works 2¼ miles away, the power being supplied by three gas-engines, two 12 h.-p. and one 7 h.-p. The charge of gas for pumping is 2s. 4d. per 1,000 ; this equalled a cost of 1d. per 2,700 gallons. There were twenty-four automatic flushing tanks at work fed from the mains of the water company. The ventilation of the sewers was effected by surface gratings (open man-hole covers) and shafts, of which they had now sixty-four of 4 in. diameter, and fifteen of 6 in. diameter. At the outfall works the installation consisted of six precipitation tanks and a complete set of sludge-pressing plant, the land being about 11 acres in extent, of which one half was underdrained. The total cost of the system was 30,115*l*. Since his appointment in May, 1897, considerable extensions had been made to the sewers, and the system of treatment had been altered. Up to December, 1899, the whole of the sewage was treated chemically and passed through precipitation tanks. Having visited works where bacteria beds were in successful operation, he suggested to the Main Drainage Committee in October, 1899, the advisability of converting one of the precipitation tanks (60 ft. by 24 ft. by 4 ft.) into an experimental bacteria bed. This was done by filling it up with furnace clinkers ; sewage was passed into it in December, 1899. The results were so satisfactory that two other tanks were converted in the following March, a change being made, however, in the material used, the manager of the works having suggested a trial of clean, sifted shingle dug from a portion of the land at the works. These two beds proved even more satisfactory than the clinker bed, so that after six months' working the author induced the Main Drainage Committee to construct a sufficient area of bacteria beds to treat the whole of the sewage bacteriologically. Accordingly, five concrete tanks of a cubical capacity of 260 yards each (60 ft. by 24 ft. by 5 ft.) were constructed, and filled with gravel. They were first charged on June 24, 1901, and have worked continuously ever since. They were worked on a six-hours cycle (*i.e.*, filled four times in twenty-four hours). The use of chemicals and the work of sludge-pressing ceased on the same day, the saving in these two items being over £300 per annum. The capacity of these gravel-beds when first charged was one-half the total cubical contents of the empty tanks ; after a few days this had shrunk to one-third, and at the end of three months to one-fifth, at which figure it had remained since. The effluent was passed over the land, and had proved satisfactory to the Thames Conservancy analyst. It had proved that these beds did not deal with the whole of the sewage, but with only 220,000 gallons out of a total flow of 340,000 gallons per twenty-four hours ; consequently, one of the precipitation tanks was still used for the surplus flow, the sludge which accumulated being passed into a prepared bay on the lowest portion of the land. The cost of these beds (£4,100) was paid out of current account. He proposed next winter to construct additional beds to deal with the surplus. As regards house connexions, a set of regulations was framed by the Main Drainage Committee and approved by the Local Government Board. These included the compulsory provision of an intercepting chamber to each connexion with the sewers. In December, 1897, he obtained consent of the Roads Committee to prepare plans for a depôt, there being no adequate accommodation for the carts and plans, and the stabling being unsatisfactory. The plans were approved by the Council, and had been carried out. The accommodation comprised stabling for nine horses (including loose box) with loft over, office, harness-room, cart sheds, blacksmiths' shop, wheelwright's shed (and shop over loose box) house for foreman, steam-roller house, &c. The principal Corporation property consisted of municipal buildings (erected 1876, with the exception of the old town hall), comprising a council-chamber, police-court, town hall, committee-rooms' retiring-rooms, offices of surveyor and caretaker's apartments, fine corn exchange, having a floor space of 160 ft. by 50 ft., the technical institute, cattle market, and a considerable number of cottages. The Council erected in 1896 a corrugated iron hospital on an isolated site about two miles from the centre of the town. This had up to the present year met all requirements. As the Rural District Council had now joined with the Corporation in providing "joint" accommodation, four more wards had just been added, so that the new hospital contained two nurses' rooms, kitchen, and scullery ; six wards, two for scarlet fever, two for typhoid fever, and two for any other disease (except smallpox) which might require isolation. The total cost of the whole place had been 975*l*., plus 68*l*. for removing the old buildings. The town was surrounded by four commons, which were within half-an-hour's walk of the centre of the town. In addition there were four open spaces available for recreation, but which could not be laid out in any way owing to the fact that there are commonable rights attached to each. There were two open-air swimming baths owned by the Corporation, with dressing-rooms and appurtenance. The water supply was in the hands of a private company. Samples were taken for chemical and bacteriological examination twice a year, the result being highly satisfactory. The water, however, was very hard (24 deg. Clark's scale). In March, 1900, he was asked by the Rural District Council of Newbury to prepare a scheme for dealing with the drainage of the village of Donnington, situate just outside the borough boundary, the total flow to be dealt with being about 3,000 gallons per twenty-four hours. Plans were prepared showing sewers gravitating to a chamber at the lowest point of the village, containing two Shone ejectors of 50 gallons capacity, the ejectors being worked from a small station within twenty yards of the chamber. The scheme was approved by the District Council and the Local Government Board, the work being completed by Christmas last at the cost of 2,000*l*. The sewage was ejected through a rising main, 700 yards in length, 5 in. in diameter, into the nearest point of the Corporation system. All works of sewer extension, road-making, paving, repairs to property, &c., were executed by direct employment of labour ; the Council, on his recommendation, having recognised that for these works this method of procedure was the best and cheapest.

Mr. J. Lemon, Southampton, in moving a vote of thanks, mentioned that twenty-four years ago he was employed by the Corporation of Newbury to prepare a sewerage scheme for the borough. When he got there he found that more than half the town was outside the municipal boundary, and he advised the Corporation that the first thing to do was to extend the borough boundary. He was told the outside authorities would refuse to join, but he saw them, found they would join on terms, and in the end prepared a scheme for the extension of the boundaries which passed both Houses of Parliament. A new Council had to be elected, as the new area was so different. He submitted his sewerage scheme to one of the first meetings of the new Council. A councillor got up and moved that the question of the drainage of this important borough be adjourned *sine die*. That was duly seconded, put to the vote, and carried, and he was done with. They said, as a kind of solatium, "It is all right, Mr. Lemon ; you will be paid." And he must say, for the honour and credit of Newbury, that they paid without grumbling. Some time afterwards they advertised for schemes and tenders, and Mr. Anstie was appointed Engineer and carried out the works. With reference to the bacteria beds, he could not understand how it was that the capacity had gone done to one-fifth. The only conclusion he could come to was that no adequate precaution had been taken to intercept the detritus which found its way into the beds.

Mr. Weaver, Kensington, who seconded, said it was gratifying to visit the smaller towns and see the work done by the young members of the Association who were coming forward in the ranks to take the place of the older members as they disappeared. He thought it was a mistake to have unchannelled roads both from a sanitary and economical point of view. He noticed that the only wood paving in the town was some Karri wood, and he thought if they waited for their experience of that wood before extending it they would not extend it in that material.

Mr. W. Harpur, Cardiff, said he noticed Mr. Vincent said he could do the work of the town better and cheaper by direct labour than by contract. He thought it the right principle for every municipality to do its street work by direct labour. They might be sure of having value for the money they expended when they carried out their own work, and that could not always be said of contract work.

Mr. W. N. Blair, St. Pancras, thought some further explanation was due from Mr. Weaver with reference to his remarks about Karri wood. Did he mean that they might have to wait so long before any result was visible that they would be precluded from using any more ; or, on the other hand, was his opinion adverse to it ?

Mr. W. Weaver said he was certainly adverse to the use of Karri wood paving. He did not say it would wear out, but if they looked at the paving outside that hall, which had been down two years, they would see that the cross joints had already opened one-third of an inch. That was the fault he found with Karri wood. He predicted that before the paving had been down for four years it would be as bad and noisy to drive over as a granite road.

The President supported Mr. Harpur's view as to doing work by direct labour, and mentioned that he was carrying out a great tramway scheme in Leicester by direct labour. He could not agree with Mr. Weaver's remarks as to Karri wood, as he had a very good experience of hard wood in Leicester, where it had worn very well.

Mr. Vincent, in reply, said the bacteria beds had shrunk to one-fifth of the total capacity, but the shrinkage was not now going on. He attributed it to the effect that there were no primary beds, and that the crude sewage had to be put on the beds. As to the Karri wood wearing, he did not think he would be in Newbury to see it wear out.

The members visited the outfall, the bacteria beds, the gasworks, and the town depot ; and at the conclusion of the round of visits were entertained to tea at the Town Hall.

ENGINEERING SOCIETIES.

SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on Monday, June 2, Mr. Percy Griffith, President, in the chair, a paper was read on "Some Twentieth Century Locomotives," by Mr. Charles Rous-Marten. The author first pointed out that a large proportion of the locomotives employed on British railways were twenty years old and upwards, many were from thirty to forty years, and some still older. British engines only twenty years old are regarded as comparatively modern, whereas twenty years old American locomotives are deemed archaic. He observed that some of those elderly British engines did most important work on the leading railways of the Kingdom, having been repaired, renewed, and rebuilt, until they were virtually new machines, but necessarily deficient in the power demanded by the requirements of modern traffic. Hence, he said, on certain lines pilóting was carried to wasteful excess. In other instances, the loads for the older engines were limited to five-sixths of that given to modern engines. That involved using six engines to do the work of five, and running six trains instead of five on roads already badly overcrowded, besides increasing the labour cost and other working expenses. This remarkable survival of elderly locomotives undoubtedly demonstrates the original excellence of their design and construction. American practice employs, in some respects, inferior materials—according to British ideas—and builds much more roughly and rapidly, the engines not being expected or desired to last more than ten or fifteen years. It is then preferred to replace them by new locomotives fitted with all modern improvements and possessing a large margin of power, especially in the boiler, such power being available in case either of ordinary need or special emergency. The author considers that it is debatable whether, on the one hand, the extreme longevity of British locomotives is desirable, involving, as it does, the crowding of the lines with old and sometimes almost obsolete locomotive types deficient in power proportionate to modern requirements, or

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whether, on the other hand, American practice, while unquestionably superior in respect of providing a larger margin of power, is not defective in its results through being wasteful in coal consumption and increased cost in repairs, in consequence of inferior material being used and of a rougher mode of construction being adopted. Each plan, he observed, has its own special advantages and disadvantages. British engines were shown to be indisputably superior to American per unit of power, but American designers provided more units of power for identical duty. These comparisons apply solely to American locomotives working in Britain or British dominions. But latterly the influence of the one feature in which American and European practice was unquestionably superior to British was seen in the vastly enhanced power, especially in the boilers, supplied to most recent British locomotives, as shown by contrast between prominent types of British locomotives of 1901 and 1902 with the leading standard types of 1895. Another result of American and European Continental influence in British practice was stated to be a tendency to multiply coupled wheels, as in the case of six-coupled wheels instead of four for passenger service, and eight instead of six for goods traffic. In conclusion, a summary was given of the leading features of modern British types of engines and the general characteristics of twentieth-century locomotive practice in Britain.

Illustrations.

THE WESTMINSTER DORMITORY.

THESE measured drawings were made in accordance with the conditions accompanying the award of the Banister Fletcher Bursary, which was founded in 1901 for the study of seventeenth and eighteenth century buildings in London. The report, dealing in full with the history of the building, forms a special article in this issue. The whole is the work of Mr. Arthur Stratton, A.R.I.B.A., of London, the first holder of the Bursary.

HOUSE, SHIREOAK, HEADINGLEY (NEAR LEEDS).

THIS is a house built some years ago from the designs of Mr. F. W. Bedford, of Leeds. Owing to the absence of the architect from home we are not able to give any details, but the plan sufficiently explains the general design.

THE NEW HOLBORN BATHS.

THE new Holborn baths, of which the frontage and entrance are in Broad-street Bloomsbury, were formally opened on Tuesday afternoon by the Mayor of the Borough of Holborn, before a considerable concourse of invited spectators congregated in the gallery of the new swimming bath.

The new baths are really an extension, as will be seen from the plan, of the old baths of which the entrance is in Endell-street, and with which they are internally connected. The Endell-street swimming bath now becomes the second-class swimming bath, the fine new one in the Broad-street building forming the first-class swimming bath.

After the contract for the new building was signed, a long time was spent in removing old buildings and preparing the special foundations, which proved necessary in consequence of the excavations showing the unsatisfactory nature of the subsoil throughout. Below the whole of the new swimming bath cement concrete walls, placed at intervals of about 6 ft., start from the hard natural ballast, and support the thick layer of concrete forming the bottom of the bath.

The plan shows the general arrangement; the new walls being tinted black and the original ones hatched. The new building is entered from Broad street through collapsible gates, which will be run back when the building is open, and will be drawn across the entrance when the place is closed. Through swing doors the vestibule is reached, and then the small hall containing the staircase leading to the gallery. A pay-office, lighted by external windows, is placed on the east side of the vestibule. Through a second set of swing-doors the large hall, containing the first-class swimming-bath, is entered. A staircase at the north end of this hall leads up to club-rooms on the first floor, and another staircase leads into the basement. Bathers can reach the north from the south end of the bath through the electrically-lighted east subway, without passing along the platform; and a staircase has been placed at the north-east corner of the hall for reaching the subway from the south portion of the building.

In the front portion of the ground story is a committee-room, with separate entrance from the vestibule, and separate lobbies, lavatory for members of committee, &c. Rooms for the use of swimming clubs have been provided. On the first floor, next Broad-street, there are two such rooms, which have been so arranged that three rooms may be made, all with separate accesses, &c., if that should be advisable hereafter, and there are also two club-rooms in the basement. All these rooms are reached by special fireproof staircases, placed at the north end of the new bath.

In the completed building there are two residences on the second floor, one for the superintendent, next Broad-street, and the other for the engineer, next Endell-street. The first is reached from an entrance in Broad-street, and by a separate staircase on the east side of the building. The other residence has a separate staircase leading up from an entrance doorway in Endell-street.

A new 6-in. main is brought from Broad-street for the supply of the new building. More rapid filling of the new bath will result from this method and size of supply. All the water will be supplied through meters. The New River Company has, in a liberal spirit, agreed to supply water for filling the new swimming bath at 6d. per 1,000 gallons. The condition made by the water company is that the delivery is to be made at a point not exceeding 60 ft. above Trinity high-water mark. Hydrants for the extinction of fire have been specially arranged for at the north and south ends of the new bath. Supplies and hose have also been arranged for washing down the surfaces of the platforms, dressing-boxes, &c.

As all the three boilers were defective—two of them practically worn out, and the third much pitted and needing a good deal of work to make it last a few years—it was determined to replace the three old boilers by two new powerful steam boilers, each 24 ft. long and 8 ft. diameter, built of steel, capable of being worked daily at 90 lbs. pressure, with all the most recent improvements, and on new seatings. The provision of the twin boilers will enable the work of the baths and washhouses to be carried on with confidence and without risk of breakdown. Being coupled up to all the mains, the boilers can be used alternately, and will thus be worn evenly, or they can be used in conjunction in times of pressure. When one must be put out of use for cleaning or minor repairs, the other, being of equal power, can do all the work till the second can take its turn. The boilers will supply steam for heating the two swimming-baths, for heating hot water for private baths and the laundries, also for all the power required in the laundries, including the forced air drying-closets, &c.

Duplicate boilers for supplying steam having been provided, it was considered desirable to carry similar reasoning further, and to duplicate also the appliances for heating water. The two heaters and reservoirs are of steel, and are placed in a chamber in the basement specially devoted to and prepared for them by underpinning walls, new drainage, &c. This arrangement has been decided upon in order that the heaters and reservoirs may be reached readily for inspection, cleaning, &c. The larger heater has 102 copper tubes. The reservoirs and heaters will store when required over 2,000 gallons of hot water for the laundry and private baths; one heater will be in use at a time, but the other will be equally available as both are coupled to the mains; and it is highly improbable that duplicate appliances recently put in and intelligently used can fail at the same moment, an accident which would throw the whole scheme out of work is practically impossible. In carrying out this work the defective condition of some of the old appliances was made apparent, and although there has been no attempt to renew everything, many alterations have been made in order to secure efficiency.

The water in the baths is warmed by "the silent heater system." Steam at considerable pressure is brought into contact with water and parts with latent heat. In a comparatively short space of time the water, supplied from the mains of the New River Co., is raised to the 72 deg. or thereabouts which is the comfortable warmth for the water in a good swimming-bath. Heat is lost after a time in consequence of cooler air playing upon the water, &c., and then the circulating system is brought into use by opening a valve. Chilled water passes through the circulating main, is warmed by steam passed through the silent heater, and comes again into the bath at a higher temperature. This can be done at any time, and the requisite temperature maintained; the whole body of water being so mixed up that, in testing, the thermometer will show throughout the bath a difference of less than 1 deg.

The air in the new swimming-bath will be heated by radiators placed at its north and south ends through which steam will be passed. The chill will thus be taken off the air, which will be kept at an even temperature of about 60 deg. By lines of steam-pipes placed at the bottoms of the lantern lights, the temperature near the glass will be raised, and it is believed that condensation on cold surfaces will be prevented. This heating of the atmosphere, besides being pleasant for the bathers, will also prevent rapid chilling of the water; and another advantage may be the shortening of the time for keeping the bath closed in cold weather.

It was resolved that there should be such a general resemblance between the two street fronts of the building, namely, the old one to Endell-street and the new one to Broad-street, as will suggest to an observer that they form part of the same building. Broad-street is of considerable width, and the building being much in view from important points, a liberal use of Portland stone was sanctioned, with T. L. B. red bricks of bright cherry-red for the general surfaces—the style being astylar Renaissance.

The hall containing the new bath has a total size of 105 ft. by 44 ft. and a height from the surface of the water of 35 ft. There is a gallery round all sides of the bath with open iron railings by Mr. Shrivell. The north portion of the gallery is 9 ft. wide and will be used as waiting-room for the swimming bath. The dressing boxes and other wood enclosures occupy the space under the gallery on the east and west sides. The gallery on the south will be merely a passage gallery, so is only 5 ft. 6 in. wide. The water chute, spring boards, running spring, teak ladders for going into and leaving the bath have all been supplied by Mr. Newman, the well-known swimmer, now superintendent of the Westminster Baths.

The walls of the Hall containing the bath are from the level of the platform lined with glazed brickwork, salt glazed bricks being used for the walls below the gallery level, and green glazed bricks for the parts above that level. The cleaning of the bath hall in the future will thus be easy. The walls of the bath pond are heavy masses of concrete, lined internally with Limmer asphalte put on in two thicknesses. The surfaces of the asphalte were roughened before hardening by the application of coarse sand. Inside the asphalte is a lining of glazed brickwork, laid and jointed in cement. The scum-trough, forming the overflow from the bath, is of moulded glazed pottery. The water in the bath will be freshened by means of the sparging pipe at the south end. By its action any scum on the surface will be driven to the trough at the north end, which will thus be at once overflow and scum-trough.

The bottom of the bath is paved with Venetian mosaic finished in hard Sicilian marble, with black lines for guidance in swimming under water. All the surfaces of the mosaic are polished. This jointless floor will facilitate the cleaning of the bath pond; a matter of considerable importance as very frequent changing of the water in the pond is proposed. The surfaces of the platforms round the bath pond slope away from the pond, and channels are formed in front of the dressing-boxes, so as to avoid risk of water rendered muddy in cleaning the platforms finding its way into the pond. The bath margins are of smooth Keinton (Somerset) stone of a light blue colour, much used in the west country; and the remainder of each of the platforms is paved with Rust's Vitreous Mosaic, an extremely hard material with non-slippery surfaces. Open channels are used throughout where possible in preference to pipes; thus in the floors of the subway channels, formed in

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granolithic, take roof water, wastes from channels in platforms over, &c.

The woodwork of the dressing-boxes is covered with three coats of Japanese lacquer.

The lighting of the hall is by upright windows forming a continuous lantern, and there is also a series of windows high up on the west side, skylights being avoided throughout. The domes, beams, coves, ribs, panels, &c., are in fibrous plaster, painted and flatted. Heating pipes at the bottom of the lantern lights will, it is hoped, prevent condensation on the surfaces in that part of the building, as the atmosphere will be heated by steam pipes placed at the bottom of the lanterns just described. There will also be radiators placed at the north and south ends of the hall. The artificial lighting is wholly by electricity; four powerful arc lamps hang over the pond, and there are also numerous Edison and Swan incandescent lights against walls, in front of gallery, and in lobbies, &c. A few gas-lights, sufficient to prevent the building being dark at any time, are provided; these gas-lights will serve as a sort of "stand by" to the electric lighting.

The amount of the original contract was 13,434*l.*, but this has been considerably exceeded by work not at first contemplated. The general contractors are Messrs. Gough, of Hendon.

In addition to their own workpeople, Messrs. Gough & Co. have employed, for boilers and engineering work generally, Messrs. Fraser & Fraser, of Bromley-by-Bow; for ironwork of staircases, Messrs. Allen & Co.; for constructional steel, the Cadogan Ironworks Co.; ventilation, Messrs. Strode & Co., R. Crittall, and C. Kite & Co.; sanitary fittings, Messrs. G. Jennings; wood block floors, Messrs. Duffy & Co.; fibrous plaster, Mr. Gilbert Seale; chimney-pieces, Messrs. Shuffrey & Co.; electric lighting and gas, Messrs. Strode & Co.; Japanese lacquer, Rhus & Co., &c.

Messrs. Lawrence & Sons, of Bracknell, supplied the red bricks; the Farnley Iron Co. the glazed bricks with which the swimming-bath hall has been lined, including ivory-white bricks for walls of the bathing-pond, salt-glazed bricks for the walls up to the gallery level, and C. T. green bricks for the walls above the gallery. The floor of the large new bath is of Venetian terrazzo, executed by the Art Pavements and Decorations Co. The platforms round the bath are paved with Rust's Vitreous Mosaic in two greens, and the entrance hall, &c., in red. The margins next the bath are of Keinton stone, supplied by Mr. Clothier, of Street. The floors of the dressing-boxes themselves are of Stuart's granolithic, executed by the workmen of the company. The paving of the galleries, subways, and the surface-channels throughout, are also of granolithic.

Messrs. Clarkson, of London, are the architects; their plans were selected in competition.

Mr. H. Butler was the clerk of works.

The new swimming-bath, in appearance and in general structure, is no doubt one of the finest in London; the only criticism we should make on it is that we do not quite like the dark mass formed by the fronts of the dressing-boxes. Everything around a swimming-bath should be bright-toned, if possible; as all masses of dark more or less affect the look of the water surface by reflection. The white domed ceiling is very satisfactory, and we prefer it to ceiling lights, in which there is an element of danger from the possible breakage and fall of glass.

BATTERSEA WORKING-CLASS HOUSES COMPETITION.

DESIGN No. 5 provides for three self-contained tenements, containing living-room three bedrooms, and scullery, &c., on each floor.

In this case it was thought to be more economical to provide a common staircase with two tenements on each floor off the same landing: an entrance door being provided on the ground floor, and also an inner entrance door for each tenement. This building could be repeated to any extent, and it is planned to be adapted to a five-story dwelling if required.

Externally it is proposed that it should be faced with red brick, having a base of darker coloured bricks to the height of the ground-floor window-sills, the window frames being painted white, with the exception of the upper ones, which would be painted green against the rough cast to obtain a contrast.

The second floor is projected so as to form a cornice and to carry the eaves gutter and Mansard roof, the soffit of the cornice being plastered and lime-whited.

The roof, including the portion between window-sills and eaves, would be covered with green slates, and the space between the windows rough-casted, forming a white frieze, the window-frames being painted green, as already mentioned.

The contents of this building, taken to a depth of 6 ft. 6 in. below the ground-floor level, and including chimneys above roof, is 26,631 cubic ft., and the estimated cost 801*l.*

SMITH & WEALD.

THE SANITARY INSTITUTE:

CORONATION DINNER.

THE Coronation Dinner of the Sanitary Institute was held in the Venetian Room of the Midland Grand Hotel, St. Pancras, on Monday evening, under the presidency of the Duke of Northumberland, K.G., Vice-President, who was supported by Sir Joseph Fayrer, Bart., K.C.S.I., Sir Francis Sharp Powell, M.P., Sir W. H. Preece, K.C.B., Sir Henry Norbury (Director, General Naval Medical Department), Sir S. E. Scott, M.P., Mr. A. Wynter Blyth (Chairman of Council Provident Incorporated Society of Medical Officers of Health), Surgeon-General W. Taylor (Director-General Army Medical Department), Mr. H. Ward (Chairman L.C.C Technical Education Board), Mr. C. Hudson (Master of the Plumbers' Company), the Master of the Carpenters' Company, Mr. C. Hawksley (President Institution Civil Engineers), Mr. H. T. Hare (President Architectural Association), Mr. E. Barnes (Mayor of St. Pancras), Mr. R. M. Hensley (Chairman, Metropolitan Asylums Board), Professor A. Sheridan Delephine, Professor Corfield, and Mr. E. G. Mawbey (President of the Association of Municipal and County Engineers). The general company included Dr. Egglestone Burrows, Dr. S. Rideal, Dr. H. R. Kenwood, Mr. Isaac Shone, Dr. E. C. Seaton, Dr. C. Childs, Professor Henry Adams, Mr. W. N. Shaw, F.R.S., Professor Henry Robinson, Mr. J. Smith, Mr. T. W. Cutler, Dr. Louis C. Parkes, Mr. J. Osborne Smith, Dr. J. Shimeld, Dr. A. W. Harris, Dr. J. T. C. Nash, Colonel J. Lane Notter, Mr. E. White Wallis (Secretary, the Sanitary Institute), Dr. F. Angles, Dr. P. Boollyer, Dr. T. E. Hill, Dr. A. Newsholme, Dr. J. F. J. Sykes, and Mr. T. de Courcy Meade.

The Chairman proposed the toast of "The King," remarking that, as members of that Institute, they remembered especially the services which his Majesty had rendered to sanitary science in the course of his life. They would all remember, in the first place, how very great an interest he had taken in the housing of the working classes, which touched so large a field of sanitary science. He presided over the Health Exhibition of 1883, and the International Congress of Hygiene.

"The Queen, Prince, and Princess of Wales, and the other members of the Royal Family," were next toasted, and then followed the toast of the "Navy, Army, and Auxiliary Forces," and the "Houses of Parliament," the former proposed by Mr. H. Ward, L.C.C., and the latter by the Mayor of St. Pancras (Mr. E. Barnes). Mr. Barnes mentioned that the administration of the health department in St. Pancras cost 40,000*l.* a year.

Sir F. S. Powell, M.P., responding for the "Houses of Parliament," remarked that the housing problem would occupy the attention of Parliament for many years to come. Overcrowding, no doubt, existed to an enormous extent in some parts of the kingdom, but there were places, notably Leeds, where the accommodation was abundant. There the growth of the population had been enormous; still the difficulty of overcrowding had been successfully dealt with. There were upwards of 3,000 uninhabited houses in the city of Leeds, and although the municipal authorities might have to take greater heed respecting those houses, still, there was no want in the place. He pointed out that there had been a great deal of legislation with regard to housing, and he argued that the condition of affairs in many places would not be so bad if the existing law were put into force. Legislation must be slow, but administration could never cease, and one of his greatest hopes for the future was in the power of administration.

The Chairman proposed "His Royal Highness the Duke of Cambridge, President, and the Sanitary Institute." He found his Royal Highness had for over twenty years been connected with that Institute. He was for many years a Vice-President. He (the Chairman) would dilate not upon the great work the Institute had done, but rather upon what it had not done and what it desired to do. In the museum what struck him most was what was missing. The place was too crowded, and it was somewhat distressing to see a room full of objects so judiciously chosen set out to so little advantage. He had been struck by another thing. No doubt the objects of that museum were most interesting; no doubt they fairly represented the different classes of objects or subjects which they wished to bring before the public; but he was sure of this, that they could display those objects to much greater advantage if they had more room; therefore, he thought one of the first duties which they had as an Institute was to find a better habitation. He was pleased to tell them that for that object 8,000*l.* had been already raised, and he hoped by the contribution of other funds they would have a museum worthy of the Institute and of the serious and important interests which the museum was intended to represent and which the Institute was formed to promote. He was glad to be able to congratulate them upon the extension of their work to other countries, especially in the conduct of examinations. He was also, he thought, justified in congratulating them upon the interest that the Institute took in the great sanitary movements of the day. There was one which he might mention, because it was coming before the public; he meant the question of Housing of the Poor. He was afraid Leeds, about which they had heard something from a previous speaker, was not quite an example of all the towns; therefore he would like to say one word of warning against relying too much upon the House of Commons. There were symptoms that the public always expected legislation to do everything they wanted. Far more could be done if Local Authorities would summon up courage to do all the law already allowed. He hoped the members of that Institute would protest against the tendency of municipalities to talk over proposals at great length, to refer them to committees, then to talk again, and then to postpone them to the next election for thet opinion of their successors. The Chairman next referred to the water question, which, according to his mind, appeared of the utmost seriousness, and one which was growing in seriousness every day. He was perfectly certain the question would never be solved until they recognised the fact that one kind of action was necessary in the country, and another in the big towns. The members of the Institute must study this question; they must take into consideration the very varying requirements of the different parts of the country, and they must not rely too much upon County Councils doing the work. They should rather incite the Local Authorities to take the matter up—teach them sound principles, and invite them to become the water suppliers of the district concerned.

Dr. Wynter Blyth (Chairman of the Council responded. He claimed for the Institute that it was an educational, examinational, and scientific society, and had performed useful and important work, which was being extended every year. There was no doubt that the Institute had considerable influence on public opinion. They wanted more accommodation—they deserved more accommodation—and they appealed to the Empire, to the English-speaking people, for funds with which to enlarge their museum and extend their work. The value of the museum to students who came from different parts of the country could not be overrated. The noble Duke had already helped them, and he, as Chairman of the Council, thanked him for his gift. They ought to have a building that should commemorate those great men who had worked with them—such men as Dr. Richardson and Dr. Parkes. The speaker mentioned that they were about to have branches of the Institute in India and New Zealand, and he suggested in view of the extension of its ramifications that the society should be styled the Imperial Sanitary Institute. They did not alone consider the sanitation of the human race; they also considered the health of domestic animals. They applied hygiene to the horse and its stable, the cow in its shed, the dog in its kennel, and even that very much over-legislated animal the pig in its sty. With regard to the technical and practical side of diseases of animals, their Institute was probably the only place that could compare

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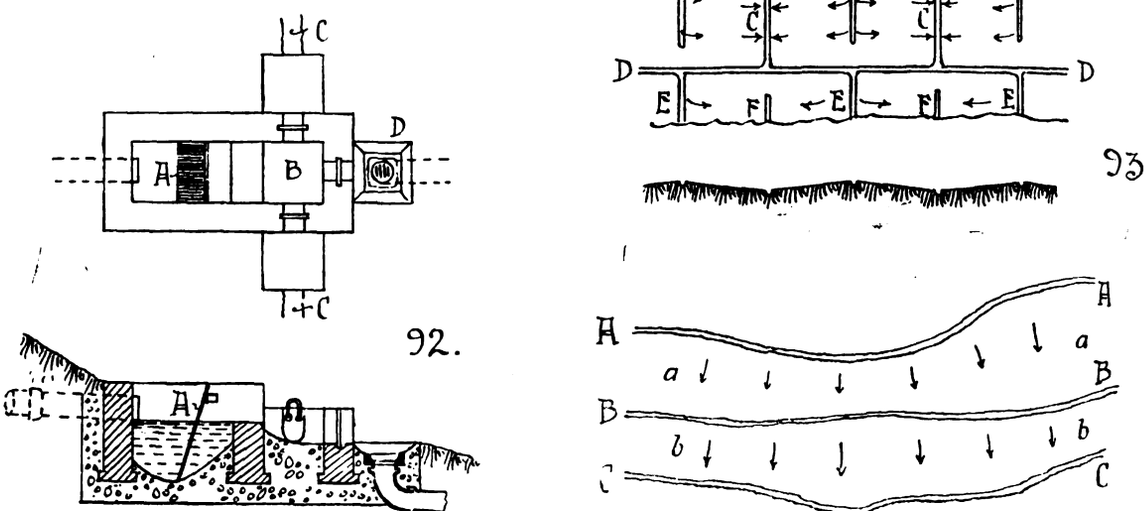

Illustrations to Student's Column.

with the great Continental schools. Within their walls alone could an inspector obtain the equipment which would enable him to acquit himself with credit. Municipal authorities might depend that all who had passed the examinations of the Institute knew their duty.

Professor W. H. Corfield proposed the health of the Chairman, who, he said, had taken the keenest interest in the Institute, and the Duke having responded, the proceedings concluded.

COMPETITIONS.

NEW SCHOOL, GATESHEAD.—At a recent meeting of the Gateshead School Board the competition plans for the proposed school in Chester-street were considered, and it was decided that the three plans marked "Gloucester," "Ely," and "Canterbury" were the best. On the envelopes being opened, the authors were found to be:—(1) Mr. F. W. Purser, West-street, Gateshead; (2) Mr. Stephen Piper, Newcastle, and (3) Mr. H. T. Hodges, Newcastle. The Board, on further consideration, resolved to erect a temporary iron building to accommodate about 400 children, and to delay proceeding with the permanent school.

The Student's Column.

PART III.—PRIVATE SEWAGE DISPOSAL.

CHAPTER 22.—DISPOSAL ON LAND.

SEWAGE may be applied to land in various ways. It may be distributed over the surface to be utilised as far as possible by growing crops; in this case, the crops are an important consideration and govern to a large extent the application of the sewage. This method of disposal, known as "Irrigation" or "Broad Irrigation," was defined by the Royal Commission on Metropolitan Sewage Discharge as "the distribution of sewage over a large surface of ordinary agricultural land, having in view a maximum growth of vegetation (consistent with due purification) for the amount of sewage supplied." It is, therefore, essentially a branch of agriculture.

In the modification of this method, known as "Sub-irrigation," the sewage is conveyed to the land by means of pervious drains laid a few inches below the surface.

In a third method, the land is laid out into filtration areas, deeply under-drained, and the sewage is applied to the surface intermittently (generally by means of furrows), and is in part absorbed by vegetation growing on the ridges between the furrows, and in part filtered in passing downwards to the deep under-drains. This is known as "Intermittent Downward Filtration," and has been defined as "the concentration of sewage, at short intervals, on an area of specially chosen porous ground, as small as will absorb and cleanse it—not excluding vegetation, but making the produce of secondary importance."

All these methods have been adopted for the disposal of sewage from private buildings, and all have given satisfactory results under favourable conditions. On the other hand, where the conditions have been unfavourable, serious nuisances have arisen. It is therefore necessary to consider carefully the circumstances of each case before recommending one method for adoption.

The sewage from private buildings—other than trade effluents, which do not fall within the scope of these articles—differs chiefly in the amount of its dilution, and the question of sewage-composition, important though it is in the case of towns, does not here call for detailed discussion. The principal points to be considered are those relating to the land available for the reception of the sewage: (1) The nature and depth of the soil; (2) its area in proportion to the volume of the sewage, or to the number of persons contributing to the sewage; (3) the relative levels of the drains and of the land; and (4) the proximity of the land to the buildings. It will also be necessary to take into consideration the position of the watercourse into which the effluent drains (if any) must discharge. The position of shallow or deep wells must also be noted, and if the water from these is used for domestic purposes, the sewage ought to be treated at such a distance and in such a manner as to avoid pollution.

Light sandy soils, of considerable depth, are best adapted for the purification of sewage. In many districts the surface soil is only a few inches thick, and rests on a subsoil of clay. Land of this kind may be utilised for broad irrigation and sub-irrigation, but is quite unsuitable in its natural state for intermittent downward filtration. The bacteria, on which the nitrification of the sewage depends, are practically non-existent in clay subsoils; thus, at Rothamsted, they were not always found in samples taken at more than 3 ft. from the surface. It has been stated that no nitrification takes place in heavy clay soils at a greater depth than 18 in., while in the most porous soils it occurs at depths exceeding 4 ft. Other objections to clay are its impervious nature when moist and continuous, and its liability to cracks when dry. Sewage, absolutely unpurified, finds its way through these cracks, and also through holes made by worms, directly to the under-drains.

The area of the available land is also a governing factor in the selection of a method of land treatment. For broad irrigation the Local Government Board requires, in the case of towns, an area of 1 acre for every twenty-five persons if the soil is stiff clay, and one for every 100 persons if the soil is loamy gravel; for intermittent filtration through a sandy gravel soil, an area of 1 acre is required for every 100 to 300 persons, according to circumstances. Smaller areas are required if the sewage is precipitated before application to the land.

In many places, smaller areas of land in proportion to the population have been adopted than those just stated. On farms with suitable soils, the sewage of 200 persons per acre has been treated satisfactorily, and on suitable intermittent filtration areas the sewage from more than a 1,000 persons has been treated per acre. At Forfar, in 1879, the sewage from a population of about 15,000 began to be treated on 7 acres of land laid out for intermittent filtration and 17 acres laid out for broad irrigation, and the result appears to have continued perfectly satisfactory. According to a resolution passed by the Local Authority in 1880, the filtration areas alone had proved "capable of absorbing and cleansing the whole of the sewage of the burgh."

It is unwise, however, to restrict unduly the amount of land for private sewage disposal. Works of this kind are, as a rule, confined to rural districts, where agricultural land is plentiful and cheap; and even if a liberal allowance of land is given, the total area required is in many cases so small as to be scarcely worth consideration. Country houses have usually appertaining to them much more land than is required for the effectual purification of the sewage. The problem is a little more difficult in the case of large institutions such as asylums, but even here the cost of the land will be a comparatively small matter. When we remember that a plot of land rather less than 70 yards square measures an acre, and that this, if it is of a suitable nature and laid out for intermittent downward filtration, will suffice for the sewage of about 300 persons (according to the basis adopted by the Local Government Board), we shall admit that the area required for an ordinary country mansion is a mere trifle, and that the value of the land for receiving the sewage of a large institution is not a serious item. When, also, it is remembered that this land can still be utilised for the growth of roots, vegetables, &c., and its productivness probably increased, the land may be regarded as an investment of a not altogether unsatisfactory character.

It must also be borne in mind that the Local Government Board can enforce its demands only in the case of Local Authorities requiring its sanction for a loan, and further, that these demands are based on experience gained in the treatment of town sewage, much of which has been rendered difficult to purify by the inclusion of trade effluents.

If the ground is not adapted for intermittent downward filtration, a larger area may be taken and laid out for broad irrigation, or, if sufficient ground for this method of dis-

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posal is not available, tank treatment followed by artificial or natural filtration may be adopted.

To utilise land for broad irrigation, careful preparation is, as a rule, required. It is an advantage to run the sewage into a small screening chamber, where grit will be deposited and coarse solids (paper, straw, &c.) retained. The screen may consist of a galvanised wire basket, through which the sewage flows and which retains the coarser solids, or may be a flat screen composed of ½-in. round iron bars about ½ in. apart, in an iron frame, as shown in fig. 92; the screen should be fixed in an inclined position, so that the solids can be easily removed by means of a rake. Fig. 92 shows a small grit-and-screening chamber of this kind, communicating with a three-way irrigation chamber B. The screen is shown at A; CC are open channels along the highest part of the irrigation area; D is the inlet to the drain (or open "carrier" of half-pipes or concrete) conducting the screened sewage to the lower portion of the irrigation area. Brick or concrete aprons should be provided at the outlets from the irrigation chamber, and small gates or paddles of wood, iron, or slate are required for stopping the semicircular openings which are not in use.

If the ground is nearly level, it must be carefully formed into beds to which a slight slope (about 1 in 100) must be given, so that the sewage will flow laterally over the surface or through the surface soil from the distributing to the collecting carriers. Different arrangements may be adopted. A common arrangement for clay land is shown in fig. 93. The main carrier A communicates with furrows B B B cut along the ridges of the beds, and the sewage flows laterally from them to the furrows C C in the depressions; these communicate with the collecting channels D D, from which the sewage passes again to the ridge furrows E E E, to be again picked up by the furrows F F. This arrangement may be repeated as often as required, but double or treble irrigation will, as a rule, suffice. More equal distribution of the sewage over the surface of the irrigated area, and more complete purification, can be obtained in this way than by simple irrigation. The ridges are usually about 40 ft. apart.

For sloping and irregular ground the "catch-water" system is adopted instead of the ridge-and-furrow arrangement just described. The sewage is led along a distributing channel cut at the highest convenient contour of the area to be irrigated, and other channels or furrows are cut along lower contours, as shown in fig. 94. The sewage is dammed up in the main carrier AA at any convenient point by means of a wood, iron, or slate stop pressed into the ground, and flows over the edge of the channel and down the slope *aa* to the next channel or furrow BB. This again is dammed where necessary, and the sewage overflows to the next slope *bb*, and passes to the third furrow CC. The number of furrows can be increased according to the nature of the soil and the slope of the surface. If the ground is steep, a greater proportionate area must be provided, as the sewage flows more quickly over it.

With either method of irrigation, it is absolutely essential that, *at least*, three separate areas should be laid out, so that the sewage can be applied intermittently to each. At certain stages of the growth of the crops, sewage, or excessive moisture of any kind, is very detrimental, and it is therefore necessary to arrange the crops on the different areas so that at no time will all the areas be thrown out of use. It is also highly desirable that, in addition to the irrigation areas, a small portion should be laid out for intermittent downward filtration, so that the whole of the sewage can on occasion be purified on this area. This is particularly necessary when rainwater is admitted to the drains.

The surfaces of the beds must be carefully graded, so that the sewage will flow as uniformly as possible to every part. Projections must be taken off and depressions filled up, and (on sloping ground) subsidiary furrows must be cut where necessary between the main furrows. Ponding of the sewage must be avoided, as this creates a nuisance.

It is sometimes said that the distinctive feature between broad irrigation and downward filtration is that in the latter the land is underdrained, while in the former it is not. This is only partially true. Some land with a deep and porous soil, not waterlogged, does not require draining, but in other cases the land must be drained in a similar manner to ordinary agricultural land. Agricultural drain-pipes, 3 in. and upwards in diameter, may be laid at suitable depths (varying according to levels of the land and of the outfall), and about 40 ft. apart. Care must be taken that the sewage must not pass directly to these drains.

Correspondence.

A QUESTION OF DISCOUNT.

SIR,—Would you or any of your readers kindly give us your opinion on the following matter? A provisional amount, as per enclosed extract from specification, is included in a certain contract we are at present occupied with, and we can conclusively prove that we have provided no additional amount on to this 2,000*l.* for our own profit, having relied upon receiving a discount through our clients of 5 per cent. to cover us for all work and risks we undertake in connexion with this item. We maintain there are risks, as we hold that in such a case we occupy the position of guarantors of our clients to the amount of this provision; as in the event of those clients finding themselves in a position of inability to pay for any work performed by the sub-contractors under this provisional amount, we are ourselves responsible to these sub-contractors direct. As we say, for this risk we are entitled to a discount; and as we can prove we have not included anything over and above this amount in the tender but kept the provision net, our clients should have no objection to this discount of 5 per cent. being allowed us by them on all amounts expended out of this provision. We may add that we acknowledge this custom ourselves by allowing the general contractor a discount ourselves in such cases, and we may further say that in this case the sub-contractor has refused to acknowledge us in the matter, and we have paid him his amount net. We had to take out our own bill of quantities, and nothing whatever is mentioned in the specification with regard to the contractor having to "add profit."

GOOD FAITH.

*** The following is the extract from the specification alluded to in the above letter:—

"*Prime Cost Allowance.*

Contractors shall include in the lump sum of the tender the sum of 2,000*l.* to provide for the cost of the coal handling plant, &c. . . . This amount shall be expended as and when the engineer shall direct, any portion of the amount not so expended being deducted from the lump sum of the contract."

BOOKS RECEIVED.

DECORATIVE BRUSH-WORK AND ELEMENTARY DESIGN. By Henry Cadness. (B. T. Batsford.)

ELECTRICAL INSTALLATIONS. By Rankin Kennedy, C.E. (The Caxton Publishing Co. 9s.)

GENERAL BUILDING NEWS.

CHRIST CHURCH, WOBURN-SQUARE, W.C.—The Ecclesiastical Commissioners for England have made a grant of 1,500*l.* out of their common fund towards the cost of building a parsonage for this benefice. The church was built in 1833 after Vulliamy's designs, with a capacity for 800 persons. The interior was remodelled and reseated, by Hall, thirty years ago.

THE EDGAR HOME, BELFAST.—This institution, which was founded by the late Professor Dr. John Edgar in 1830, is now removed from Brunswick-street out to Whitehall, Ormeau-road. The committee last year purchased the mansion house, called Whitehall, together with two acres of ground, and it and the extensive buildings have involved an outlay of over 10,000*l.* There is provision for seventy-five inmates besides the officers of the home, and arrangements are made for carrying on laundry-work on an extensive scale. The additional premises at the home have been planned so as to take full advantage of the stone house which occupies one angle of the site. It affords accommodation on the ground floor for parlour, committee-rooms, chapel, and pantries. On the first floor are arranged matron's and assistants' rooms, with large dormitory. Above this level are placed servants' bedrooms and bathroom. The new buildings adjoining the foregoing have a frontage of above 150 ft. by 130 ft. They comprise on the ground floor a spacious corridor 90 ft. long, approached both from the new entrance porch and the former hall. From the corridor, access is obtained to the dining-hall, 40 ft. by 22 ft., with kitchen, scullery, and pantries adjacent. Behind these is the recreation hall, 40 ft. by 25 ft. A servants' dining-room is also provided. Ample provision is made for the extensive laundry department. Two receiving-rooms are placed adjacent to the hall, which also opens directly on the ironing-room, 60 ft. by 20 ft. The laundry is 40 ft. long, with large store-rooms at each end. Above the laundry are two large drying-rooms, 60 ft. long, with hoist. On the first and second floor are ranges of well-lighted dormitories, approached by fireproof stairs and corridors, and with lavatory accommodation. Two large boilers, with 90-ft. chimney, occupy part of the yard, which also contains stores and stabling. The walls are built of Belfast perforated bricks, rough dashed, with cement dressings. The boiler has been supplied by Messrs. Victor Coates & Co., Ltd. The plumbing and laundry fittings have been executed by Mr. John Dowling, Queen-street; and the terrazzo work by Mr. J. Ebner, London. The general contractors were Messrs. Courtney & Co., Ltd.; and the architects, Messrs. Young & Mackenzie, of Belfast.

CHURCH, DAIRYCOATES, HULL.—This church was opened on the 29th ult.; it is dedicated to St. Peter and St. Mary. The style is Romanesque, the nave arcading having semi-circular arches, supported on circular stone piers with moulded bases and carved caps. It is built of red bricks with terra-cotta dressings, the roof being covered with red Staffordshire tiles. There are two entrances, both on the north side, giving access from the Hessle-road, the main entrance having two porches with semi-circular modelled arches. The accommodation is at present provided for 558 persons. The chancel (which, when built, will accommodate a choir of forty) and organ-chamber are not yet erected. The contractors for the work are the executors of the late Thomas Southern, and the architects Messrs. Brodrick, Lowther, & Walker, Hull and Bridlington.

REOPENING OF LANDULPH CHURCH.—This church, which has undergone considerable restoration, was reopened on the 27th ult. In the work of restoration care has been taken not to introduce anything which would not harmonise with the ancient parts. The north wall had gone so much out of the perpendicular that it was found necessary to pull it down and replace it stone by stone. The fine old windows and the walls and roof outside have been thoroughly repaired. In the course of the restoration of the north side a doorway was discovered which had been plastered up. This has now been thrown open. In the interior the old oak ceilings of the aisles have been repaired. That of the nave is entirely new. Six dormer windows have been placed in the roof, and these much improve the lighting of the church. Near the altar have been discovered the places where in olden days the holy vessels were cleansed, and these interesting receptacles are to be thoroughly restored. The fifteenth century rood screen, on which is some very fine carving, is likewise to be renovated, and the old rood steps are still intact. The seats of the church had fallen into a ruinous state, and they have been removed and chairs substituted. Portions of the old seats are to be used in constructing screens for the chancel. The tower has been opened up, and the floor has been repaired with Delabole stone and wood. Altogether the renovations will cost 2,058*l.* The architect was Mr. G. Fellowes Prynne.

PRIMITIVE METHODIST CHURCH AND SCHOOLS, PETERSFIELD, HANTS.—The memorial stones of new Primitive Methodist Church and schools were recently laid at Petersfield. The buildings will be of brick, with Bath stone dressings, and will have seating accommodation for 200. The size of the church will be 37 ft. by 27 ft. The pulpit and pews will be of pitch pine, the side pews being fixed diagonally. The schoolroom will be 25 ft. by 22 ft., with movable platform. The windows will be of cathedral glass, with lead lights in front. The estimated cost of the whole, including the site, is 1,250*l.* Mr. T. E. Davidson, of Newcastle-on-Tyne and London, is the architect.

NEW CHURCH, RADSTOCK.—A new church has recently been opened at Radstock. The architect was Mr. W. J. Willcox, of Bath, and the contractors Messrs. Hodder & Son, of Frome.

EPISCOPAL CHURCH, BIELDSIDE, ABERDEEN.—The corner stone of this building was laid on the 27th ult. The church, already well advanced, is being built from plans by Mr. Arthur Clyne, Aberdeen. The style of the building is Gothic, with Scottish features, and the effect of the design will be enhanced by the character of the masonry, a combination of red and grey granites from Hill of Fare and Rubislaw quarries, respectively. A feature of the masonry also is the sparing introduction of fine or expensive dressings in the building, the surface of the stones for the most part being left quite rough, almost as they come from the quarry. The principal dimensions of the building are as follow:—Total length internally, 89 ft.; width of nave and chancel, 25 ft.; width across transepts, 53 ft.; height from floor to apex of barrel vaulted ceiling, 34 ft.; height from ground level to ridge of roof, 49 ft.; height of bell tower, 78 ft. The church will accommodate about 250, and provision has been made in the design for extension if desired, the addition of a north aisle and transept increasing the total accommodation to some 350 sittings. The estimated cost of the building is about 3,000*l.* The contractors are:—Carpenter, Messrs. Hendry & Keith; plumber, Messrs. Blaikie & Sons; slater, Mr. A. E. Merson; plasterer, Mr. A. Stephen; painter and glazier, Mr. E. Copland, all of Aberdeen; and the contractor for the masonry was Mr. F. Morrison, of Culter.

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WESLEYAN SCHOOLS, MIDSOMER NORTON, SOMERSET.—These schools were formally opened on the 28th ult. They are erected on a site facing High-street, adjoining the Wesleyan Chapel. The infants' department is placed nearest the road, while the mixed department, with large assembly hall, stands on rising ground at the rear, a short covered corridor and flight of stone steps connecting the two blocks. In the infants' department there is provided a marching hall, 48 ft. by 16 ft. Three classrooms are provided. The mixed schools consist of a central hall 64 ft. by 30 ft., two cloak-rooms, and five large classrooms, accommodation being provided for 336 scholars; and the plans admit of future extensions for 150 children. Mr. William F. Bird, of Midsomer Norton, was the architect, the contractor being Mr. W. Tovey, of Midsomer Norton, and the total cost, including purchase of land and furnishing, is about 4,700*l.*

WESLEYAN CHAPEL, ALDFIELD, RIPON.—The foundation-stones of a new Wesleyan chapel at Aldfield, in the Ripon circuit, were recently laid. The new structure will be entered from a porch on the east side, and will accommodate eighty-one adults. There will be two rows of pews, with an aisle down the centre, the rostrum being at the south end. At the opposite end to the rostrum, and entered from the porch, a schoolroom has been designed, and this will afford seating for fifty persons. The latter room is separated from the main building by a readily movable wood partition. The building is designed in the early Gothic style, and is to be faced on the east and north fronts with red pressed bricks, from Messrs. J. W. Green & Sons, Borough Bridge, and the roof is to be blue slated. Internally the walls are to be plastered, the seatings, dadoes, doors, &c., being in varnished pitch-pine. Mr. J. H. Coldbeck, Ripon, is the builder, and the amount of the contract is 478*l.* 10s. Mr. T. Stokes, of Thirsk, is the architect.

POST OFFICE, DUNOON, N.B.—New Post-office buildings, erected at Dunoon, were opened on the 28th ult. The builder was Mr. Colin Macandrew, of Edinburgh, and the architect Mr. John Breingan, also of that city.

HOME FOR INCURABLES, HARROGATE.—This home was opened by Sir Christopher Furness, M.P., on the 21st ult. The building, which is of Pateley Bridge stone, stands in Cornwall-road. It possesses a handsome frontage 157 ft. in length, and the depth of the building is over 85 ft. One of the features is a winter garden. The system of ventilation adopted enables the vitiated air to be drawn into the several chimney breasts at the ceiling level. The building has cost between 15,000*l.* and 16,000*l.*, and has been erected from plans prepared by Mr. T. E. Marshall, of Harrogate.

NEW BUILDINGS, TRINITY COLLEGE, DUBLIN.—The new Trinity College buildings, consisting partly of the Graduates' Memorial erected by the graduates, and partly of the new chambers for students, was opened on the 30th ult. The former is the outcome of the Tercentenary celebrations, and the latter, provided by the Board, have been joined in an architectural scheme, so as to form one block—the memorial building being in the centre, and the students' new quarters in the wings. This pile is situated on the site of what used to be known as "Rotten Row." It looks out on the Library square, and faces south. The buildings have a total length of 189 ft., an average breadth of 64 ft., a height at highest point of 82 ft. They are constructed of granite with dressings of Portland stone; and the style of architecture is Renaissance, with decided French leanings. The triplex idea in the construction is preserved in the south front. A centrepiece is formed by the memorial section, ornamentally roofed, which runs higher than either of the wings, and the wings in their turn have gable apexes, which are a reproduction on a smaller scale of that of the central building. Along the entire front on the first floor runs one principal architectural order, in which Ionic pilasters are the chief detail; and on the second floor there is a similar order for the central building, as well as a corresponding order for each of the wings. In the wings there are stone dormer windows for the attics, and each of the three roof-pieces are carved. The buildings as a whole have ground floor, first floor, second floor, and attics. In the Memorial Building, which is the most ornate and spacious in both its external and its internal scheme, the ground floor is given over to a large room intended for the library, and a writing-room. The library, which is situated in the rear, is 40 ft. square, decorated with Ionic pilasters and with Classic cornice. There is an ornamental gallery for working a lantern, &c. Looking out on the Library square is the writing-room, also a spacious apartment, measuring 40 ft. by 24 ft. In conjunction with this floor, as also with each of the other floors, there is a committee-room. On the first floor there is a large reading-room in front and a committee-room behind. On the second floor there are again two large rooms corresponding in size and position with those on the lower floors. These rooms are not appropriated to any definite uses at present, but the idea is apparently to set them apart as clubrooms for the Historical, Theological, Philosophical, or other College Societies. In the attic there are two rooms also, the larger of which is intended to be used as a billiard-room. It is not quite finished at present. The front of the graduates' building stands forth more prominently than that of the wings, and it is also endowed with a greater wealth of architectural detail. The wings devoted to students' chambers afford accommodation for forty students, and comprise in all eighty rooms, a bedroom and sitting-room being set apart for each student. In each wing an oak staircase gives access to the rooms on the upper floors and attic. Each room has a fireplace, and off the passages to the bedrooms there are coal stores. A lavatory is also provided on each floor. In the basement there is a furnace-room and a cloakroom, and in connexion with the former, Grundy's system of heating by hot air is installed. The first window off the stairs is a memorial in stained-glass to the late Mr. Marshal Porter, a distinguished and gallant graduate of the University, who lost his life in the South African war. This work was executed by Messrs. Heaton, Butler, & Bayne. The contractors were Messrs. Sharpe & Emery, Great Brunswick-street, Dublin. The contract was 21,000*l.*, but there were extra works which brought the amount to a larger figure. Sir Thomas Drew, of Dublin, was the architect.

METHODIST CHURCH, HEREFORD.—The foundation-stones of this church, situated in Chandos-street, were laid on the 29th ult. Externally the church will be built with pressed bricks, with Grinshill stone dressings. In the front there will be a window of mottle-tinted glass. The principal entrance will have columns of red Alverley stone, with carved Portland stone bases and caps flanking the sides. Internally, the furniture will be of pitch-pine. There will be three rows of seats with two aisles, and wood-block flooring will be laid down. In the designs prepared, a school-house has been provided for. The builder is Mr. W. Powell, of Hereford, and Mr. W. W. Robinson, of the same city, is the architect.

HOSPITAL, WATH, SWINTON.—The new hospital of the Wath, Swinton, Greasbro', and North Rotherham Joint Hospital Board, at Wath Wood, is now ready for the reception of patients. The accommodation is for twenty-four beds, with all necessary offices, and a steam laundry. Mr. Campsall, of Sheffield, is the architect, and Mr. Smith, of Mexborough, has executed the building work; Messrs. Roberts, of Sheffield, and Messrs. Asher & Son, Wath, the furnishing; Messrs. Summerscales the steam laundry; Messrs. Trusswell the heating apparatus; and Messrs. Snowden the plumbers' work.

WESLEYAN CHURCH, IPSWICH.—The memorial-stones of this church, which is situated in Bramford-road, were laid on the 28th ult. It is to be built in red brick, with Gunton white dressings. The roof will be of plain tiles, and the principal entrance from the main thoroughfare in the Bramford-road. The plan provides side entrances with a view of enabling stairways to be constructed leading to a gallery. The chapel will be 50 ft. long by 38 ft. wide, and will seat about 400 persons. There will be a school-room at the rear 44 ft. long by 25 ft. wide, and this will afford accommodation for 350. Four class-rooms, with infant school and vestry, are contemplated, the central class-room, dividing two of the rooms, can be added to the chapel at any future time, the two rooms on the other side being appropriated for the purposes of the choir, and the other two rooms utilised as vestries. The benches of the chapel will be of pitch-pine. The estimated cost is 3,000*l.*, including the site. The builder is Mr. Charles Roper, and the architects Messrs. Eade & Johns, of Ipswich..

NEW CHURCH, LEIGH, LANCS.—The foundation-stone of the St. Thomas's Church, Leigh, was laid on the 31st ult. The building, which is to be in the Early Perpendicular style, will cost 12,000*l.* It will have a chancel of three bays and a tower 20 ft. square, the height of which from the ground to the top of the parapet will be 75 ft., or 100 ft. to the top of the cross surmounting the small spire. The church has been designed by Mr. R. B. Preston, architect, of Manchester.

WESLEYAN CHURCH, BEESTON, NOTTS.—The new Wesleyan church, Chilwell-road, Beeston, was opened on the 29th ult. The church is designed in the Decorated Gothic style. It will accommodate about 850 people, and the range of buildings includes extensive Sunday schools. The structure is of pressed brick, with stone dressings, and the spire rises to a height of 130 ft. The church roof is waggon-headed and of pitch-pine, which has been used also for the whole of the interior woodwork. The windows are glazed with stained glass, and the lobby has a mosaic floor. The rostrum is of polished walnut, and has velvet panels with floral designs hand-worked thereon in gold thread by some of the ladies connected with the church. The schoolroom is spacious, light, and lofty, with open roof and stained-glass end windows. There are seven classrooms grouped around the school, also a men's classroom, and a spacious ladies' parlour and kitchen. There are separate vestries for the ministers, stewards, and choir, together with the customary out-offices. The architects are Messrs. W. J. Morley & Son, of Bradford. The building contractors were Messrs. H. Vickers & Son, Nottingham, brick and stone and slaters' work, and the following were the sub-contractors:—G. Thompson, Leeds, plumbing; B. Sugden & Son, Bradford, plastering; and Varley & Son, painting. The stained glass is by Lazenby & Co., of Bradford, and the heating by Danks & Co., Nottingham. The total cost of the buildings, exclusive of furniture, is about 6,700*l.*

WESLEYAN CHURCH, ROWLANDS GILL, NEWCASTLE.—This Wesleyan church was formally opened on the 31st ult. The building was commenced in the spring of 1901, and has been built by Messrs. Turner Brothers, of Gateshead, under the direction of Mr. F. R. N. Haswell, architect, North Shields. It is constructed of stone walls, faced with Tow Law blockers, and the interior measures about 60 ft. by 32 ft., the three classrooms averaging about 16 ft. by 14 ft. The pulpit platform has a centre seat placed under a carved wood canopy. At the opposite end of the church are the two main entrances, leading from Strathmore-road. The gable towards Strathmore-road is at present the most ornamental part of the structure, and the windows are filled with stained glass. The side windows are also filled with leaded lights, provided by Messrs. Thompson & Snee, of Gateshead. The heating is by hot water, carried out by Messrs. H. Walker & Co., Newcastle. As the building has in the meantime to be adapted to school purposes, the seating is partly made with movable backs, which has been supplied by the North of England School Furnishing Co., Newcastle. The chairs, linoleum, and other upholstery were supplied partly by Messrs. Snowball, of Gateshead, and partly by Messrs. Bainbridge, of Newcastle. The total estimated cost of the building is 2,640*l.*

SANITARY AND ENGINEERING NEWS.

AN OFFICIALLY APPROVED ELECTRICITY METER.—The Board of Trade have made an order in approval of the pattern and construction of a meter, No. 0,910, made by Chamberlain & Hookham, Ltd., of Birmingham, and known as the "Hookham" meter, for electricity supplied on the constant potential continuous current system. They also approve of meters after that kind being fixed by screws to a horizontal support, and being connected thus: one service line to be cut and the ends bared of insulation at the cut for about 1 in., the insulation being cut straight across; the outside of the insulating material is to closely fit the hole through which the line passes to the terminal; the connexion to be so made that the current goes through the meter from the + terminal to the − terminal; and the ends of the conductors, which must be tightly clamped in their terminals, are not to project beyond the tops of the terminal boxes

ELECTRIC LIGHTING IN THE CITY.—A report made by Mr. Clifton and Mr. Patchell, architect and engineer-in-chief respectively to the Charing Cross and Strand Electricity Supply Corporation, comprises estimates of 60,000*l.* for the completion of the generating station at Bow and for distributing stations at Fenchurch-street, Ludgate-hill, and Upper Thames-street, 108,000*l.* for completing the trunk and other mains and service connexions in the City, and 113,000*l.* for machinery, &c. The company have already expended 645,060*l.* upon sites, buildings, machinery, mains, &c. They have supplied, or have contracted to supply, 220,000 eight-candle power lamps in the City, and their present instalment at Bow is adequate for 225,000 lamps. They calculate that an additional outlay of 300,000*l.* will enable them to increase the capacity of supply to 375,000 lamps. The figures we quote relate to the "City undertaking" of the Corporation. During eight years past they have served the western portions of the town from their generating station at Lambeth.

WATER SUPPLY, BARROW.—Colonel Strongitharm, who is an alderman of the Barrow Town Council, has been selected to carry out the scheme for bringing water from the Duddon to Barrow. He will resign his seat on the Council.

WATERWORKS, OTLEY, YORKS.—The first sod of the new reservoir at Otley Waterworks was recently cut. The work already done in connexion with this water supply scheme includes the beginnings of an embankment 240 yards in length, which will keep back the moorland streams until a reservoir has been formed providing a storage of 100 million gallons of water—the equivalent of 260 days' supply. Over the embankment a road will be carried, having a bridge across the by-wash with a span of 30 ft. and a width of 17 ft., and at one end a caretaker's house is to be built. Filters also are to be constructed to remove the acidity of the peat and prevent corrosion of the pipes, and there will be an arrangement whereby 150 000 gallons of "compensation water" may be daily turned on for the use of millowners. The supply will be on the gravitation principle. Seven miles of 10-in. pipe line will carry the water down, and the cost of that part of the work is estimated at 3,000*l.* The cost of the whole waterworks scheme is estimated at 80,000*l.* Mr. John Waugh, C.E., is the engineer and Mr. W. S. Arnold the contractor.

FOREIGN.

AUSTRALASIA.—The Forest Department of New South Wales is now paying considerable attention to the forestry of the country, it being recognised that the forests may be turned to better advantage than hitherto. One practice, widely condemned, which is to receive immediate attention, is the

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felling of innumerable splendid trees on Crown lands simply as a speculation, and these trees have then been left to rot on the ground. The supply of good timber is said to have been allowed to run down without making provision for conservation or replanting.——The Citizens' Life Insurance Co. are about to erect new offices in Wellington, New Zealand, at a cost of about 30,000*l.* Mr. J. Charlesworth, of Wellington, is the architect.——New convent buildings, erected at Abbotsford, Victoria, have recently been opened. They are in the Early English Gothic style, contain more than 200 rooms, and cost nearly 29,000*l.*——A new Roman Catholic church erected in Kensington, Victoria, has now been completed. Its estimated cost is 2,000*l.*——The Inter-State Convention of master plumbers and sanitary engineers was opened in the Town Hall, Adelaide, early in April last. The business dealt with chiefly had reference to the best means of preserving the public health, from a plumbing point of view.——At the first general meeting of the Institute of Architects of New South Wales, held on April 3 last, Mr. G. Allen Mansfield, F.R.I.B.A., was elected president; Mr. Cyril Blacket, vice-president; Mr. G. Sydney Jones, A.R.I.B.A., hon. secretary; and Mr. A. F. Pritchard, hon. treasurer. The new president has been connected with the Institute for thirty years. The retiring president, Mr. John Barlow, F.R.I.B.A., who has occupied the chair for the past four years, referred to the recent progress made by the New South Wales Institute.

UNITED STATES.—Columbia University is separating its schools of architecture and music from the departments to which they have hitherto been attached, and combining them into a new department of fine arts, to which will be added, later, if the proposed scheme is carried out, schools of painting and sculpture.——The Massachusetts Institute of Technology has acquired a tract of about twelve acres of land in Brookline, in order to erect buildings thereon for the accommodation of some of its departments, the present buildings having proved inadequate.——It has been decided to postpone the Louisiana Purchase Exposition until 1904, it having been found impracticable to have the exhibits ready by next May—the month in which it was originally proposed to be opened.

INDIA.—The North-Western Railway is building a large gas factory at the Karachi end of their line. At the same place the company is erecting an institute for the use of their employés, which was expected to be opened late in the present month. ——The Government of India has sanctioned the remodelling of Parbatipur Junction station, on the Eastern Bengal State Railway, with a view to improving the train service and effecting an appreciable economy in time in travelling.——The committee charged to consider the nature of a memorial to Queen Victoria at Allahabad have decided to erect a clock tower, the base of which is to form a canopy over a bronze statue of her late Majesty. Architects and others are invited to send in designs, and a premium of 2,000 rupees is offered, the competition to close on November 1 next.

AUSTRIA.—The Committee of the Deutschmeister Monument have invited designs for that work from Vienna sculptors, and there is every evidence that there will be a spirited competition. The authors of the first three premiated designs will receive 6,000, 4,000, and 2,000 kronen respectively, and the competition closes on January 20 next.——The authorities of the Buildings Department of Vienna contemplate erecting public offices near the centre of the city, and have issued instructions to city architects in connexion therewith.——Very little progress seems to have been made in reference to the improvement scheme whereby wide boulevards were to be constituted near the cathedral in Vienna. The general arrangement appears to be somewhat analogous to our Strand-Holborn new street and improvement scheme.

MISCELLANEOUS.

LAND BUYING.—Land buyers should consider the *relative* advantages of land offered to them. Land at a low price, far from a town and station, and of very ordinary qualifications, is not necessarily cheap land; but land convenient to a town and station and in a position towards which the town is extending, and with good residential qualifications, is cheaper at a far higher price than the other. The former remains what it is, the latter is not only much more valuable now as possessing qualities for development, but taking into consideration its constantly increasing "unearned increment," is ever advancing in value. By buying land near prosperous and growing towns the fortunes of many families throughout the country have been founded.—*The Land Roll.*

THE ORDNANCE SURVEY (GREAT BRITAIN).—The Ordnance Survey Office have begun the issue of a new series of maps for Great Britain, prepared under the directorship of Colonel D. A. Johnston, R.E. The maps are based upon a revision, commenced four years ago, of the outline maps of England and Wales on the scale of four miles to the inch, and have been extended to include Scotland. The new maps are printed in five colours—burnt sienna for main roads, green for large woods, light brown for hills, and blue for water; they also, for the first time, indicate hilly and mountainous country with stipple shading by photo-etching, the scale being too small for the customary use of contours in that respect. England and Wales will be covered by a complete set of twenty-five sheets, at a price of 1s. 6d. per sheet (unmounted); the seventeen sheets for Scotland will be sold for 1s. each; combined sheets, folded in a cover, will soon be ready for sale.

THE CORPORATION OF LONDON AND THE GRAIN DUTIES.—The Corporation have notified that the ancient rights of metage will cease to be exercised in the City after the end of the present year, concurrently with the expiration of the grain duty. The Metage on Grain (Port of London) Act of 1872, abolished compulsory metage on grain, in lieu of a commutation for a fixed duty during a period of thirty years which is now coming to a close. In return for the revenue derived from that source, which has yielded a gross income of about 19,000*l.* per annum, the Corporation undertook to manage and maintain many open spaces, amongst them being Wanstead Park, Epping Forest, West Ham Park, and Coulsdon Common. A charter, *temp.* Edward III., guaranteed the metage rights of the City, and the Lord Mayor, as clerk of the markets, regulated all weights and measures used in the markets of London. It is recorded that Edward IV. conferred the office of chief gauger on the Lord Mayor by way of paying a heavy debt due to the City.

CITY OF LONDON LYING-IN HOSPITAL.—We learn that the fabric of this hospital has been authoritatively pronounced to be in an unsafe condition. The hospital, which stands at the corner of the City-road and Old-street, was built in 1771-3, after plans and designs by Robert Mylne. The charity was originally founded in 1750, at Shaftesbury, otherwise known as Thanet, House, in Aldersgate-street, which had been built after designs by Inigo Jones, and was pulled down about twenty years ago.

CORONATION ARCH, WHITEHALL. — Messrs. Walker and Ramsay, of Glasgow, have been appointed architects of a temporary triumphal arch which the Canadian Government propose to erect at Whitehall. The arch is to be symbolical of the cereal products of that Colony, and will embody a scheme for its illumination at night.

BUILDING ACTIVITY IN BARNSTAPLE.—Considerable interest was taken in a recent auction sale at Barnstaple, when the large open space of ground at the rear of Boutport-street, known as the Rackfield estate, about 5½ acres in extent, was purchased by Mr. C. H. Symons, of Barnstaple. Plans have now been approved by the Town Council, and building will shortly be commenced. It is proposed to erect 160 houses of the superior artisan type, with lines of frontage varying from 15 to 18 ft. in width, and a depth of from 50 to 100 ft. There will be two main streets, Coronation-street, reaching from Boutport-street to the end of Higher Maudlin-street, a distance of over 600 ft., and King Edward-street (crossing Coronation-street almost at right angles) from Vicarage-street down to the Mill Leet behind the Yeo Vale estate. A shorter street following very much the same lines, only nearer Derby, will be called Charles-street, being linked to King Edward-street by a short street. George-street further connects the two main thoroughfares.

WORKMEN'S DWELLINGS, NEWCASTLE.—At a meeting of the Newcastle Town Improvement Committee, held on the 28th ult., the plans for workmen's dwellings, which the Newcastle Corporation propose to erect in Walker-road and Quality-row, were passed, the differences with the Local Government Board on the subject of room accommodation having been adjusted. The buildings, we understand, will contain about 140 separate dwellings of varying extent in accommodation. Tenders for their erection will shortly be invited. These dwellings are to be built to provide homes for working people displaced by street and other improvements in the city. When they have been completed, it is probable that the proposed extension of Market-street, by cutting a thoroughfare, 60 ft. wide, through the area behind the east side of Pilgrim-street right away to New Bridge-street, will at once come up as a practical measure before the Council.—*Newcastle Leader.*

PLUMBERS' REGISTRATION BILL.—At a meeting of the executive committee of the National Association for the Promotion of Technical and Secondary Education, on May 30, the following resolution was unanimously adopted:—"That the Plumbers' Registration Bill now before the House of Commons would be injurious to the best interests of education; and, having regard to the resolution against any Bill whatever passed at a representative conference of educational and industrial bodies, held three years ago under the auspices of the National Association, the executive committee considers that nothing has occurred to render desirable another decision of the subject, and therefore expresses the hope that the present Bill will not be allowed to pass."

THE SLATE TRADE.—The mineral statistics just issued show a falling-off in 1901 of 85,000 tons of slate from open quarries. The greater portion of this is accounted for by the partial stoppage of the Penrhyn Quarries. There is also a falling-off of nearly 12,000 tons from slate mines; these comprise the leading Festiniog quarries, and as demand is good, both at home and abroad, merchants should place their orders as early as they can.

PIER IMPROVEMENTS, BLACKPOOL. — Terms having been agreed upon between the Corporation of Blackpool and the North Pier Co. for the setting back of the pier entrance for the purpose of the proposed widening of the promenade, the North Pier Co. have decided to carry out certain improvements in the way of a more imposing entrance, as well as another pavilion at the shore end of the pier. The scheme is estimated to cost 20,000*l*

MARBLE QUARRIES IN THE CYCLADES.—In his annual report, just received at the Foreign Office, Mr. Cottrell, British Consul for the Cyclades, mentions that in the year 1897 a British company, under the name of Marmor, Ltd., was started in Greece, with head offices in London, for the acquisition and working of the marble quarries of Greece. This company has carried on business in various parts of the Cyclades. In the island of Skyros they obtained, under a contract with the municipality of the island, the exclusive right to extract marbles for a period of fifty years. The work commenced in 1899, and until the end of 1901 the extraction amounted to 1,351 cubic metres. This marble was extracted from the old Roman quarries with which the island is honeycombed. The marble consists of white, white and red, white and yellow, white and purple, &c., and also marble with many colours in one piece. Like most coloured marble, however, this marble is very brittle, and it is exceedingly difficult to get large blocks. The grain is very fine, and the colours very delicate, but owing to its brittleness and the time incurred in extraction, the expense is very great. The company have put down installations, have built a mole, and made a road seven kiloms. long, and generally employ about 300 men. The same company are extracting marble in Tinos, almost entirely dark green and black veined. These quarries were originally opened up by a man named Seigel, a sculptor from Munich, who reopened these quarries under the belief that they were the long lost *verde antico*. The columns for St. Paul's, outside the walls at Rome, and the Roman Catholic Church, St. Dionysius, Athens, were extracted from these quarries by him under the belief that it was the genuine *verde antico*. On the death of Seigel the quarries were bought by a Mr. Kloebe, at that time German Consul in Syra, and carried on by him until his death. During the lifetime of Seigel and Kloebe a certain demand was created for these marbles, and when at Kloebe's death the quarries were closed, the demand was filled by a second substitute, namely, *verdes des Alpes*, extracted from quarries close to Genoa. This marble, although not being the real *verde antico*, which has recently been discovered near Thessaly, is still a beautiful marble, and, as the quarries are near the sea, transport is easy, and the marble can be supplied at a low price. The quarries began to be worked in 1900, and up to the end of 1901 205 cubic metres were extracted. The company, having installed wire saws on the latest principles, are able to extract blocks and columns of almost any size. The same British company have quarries in the islands of Naxos and Paros, which, however, they have not yet commenced to work. The Greek Company of Marbles of Paros have laid down installations in the island of Paros for extracting and sawing marble, but they have not been very successful. This company also owns quarries in Naxos, Antiparos, and Amorgos, and are now negotiating with the British company to sell the whole of their plant.

CAPITAL AND LABOUR.

BRICK AND STONE LAYERS' SOCIETY, DUBLIN.—The following resolution has been adopted at a special meeting of the Incorporated Brick and Stone Layers of Dublin:—"That we pledge ourselves to support the Amalgamated Society of Engineers in their fight for an increase in wages, and we believe the manner in which the men have conducted the strike proves the justification of their demand, which is only in accordance with the rapid increase of house-rent in this and other large cities; and, in support of this resolution, our treasurer be instructed to forward a cheque to the treasurer of the Strike Committee of the Amalgamated Engineers; and that copies of this resolution be sent to the Press and the Amalgamated Society of Engineers."—*Freeman's Journal.*

LEGAL.

IMPORTANT BUILDING CASE.

IN the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, on the 27th and 28th May, the cases of Belcher *v.* the Roedean School Site and Buildings, Ltd., and *in re* an arbitration between the Roedean School Site and Buildings, Ltd., and Belcher and others, came on for hearing on appeals by the company from two orders of Mr. Justice Bucknill in Chambers, dated May 12 last.

Mr. Ralph Neville, K.C., and Mr. O'Leigh Clare, appeared in support of the appeals; and Mr. Reginald Bray, K.C., and Mr. Hudson, for the respondents.

Mr. Neville, in opening the case, said that the two orders appealed against were closely connected, and had better be taken together. The questions which he had to ask their lordships to determine were, broadly speaking, first, whether the Roedean Co.

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were entitled to enforce a certain award made under a building contract: and, secondly, in the other case, whether the plaintiff Belcher was entitled to proceed with an action in respect of matters which had been dealt with by the arbitrator, and which were the subject of the award in question.

The Master of the Rolls: The question is whether the award is a good one or not?

Mr. Neville said he thought that was the only point, but there might be other views expressed on the other side. The facts would involve a short historical retrospect. The arbitration clause was contained in a contract dated February 25, 1897, made between the company and Messrs. Peters, Peter, & Son, and it was a contract entered into for the erection of the Roedean School at Brighton. The amount of the contract was something between 43,000*l.* and 44,000*l.*, and Clause 26 was the arbitration clause, which was the important one, and which provided that in the event of any disputes arising between the company and the builders they should be referred to the architect, whose decision should be binding and conclusive on both parties. The architect was a Mr. J. W. Simpson. The date for the completion of the buildings was September 1, 1898. There was a power to determine the contract and to take the work out of the builders' hands and complete it under Clause 20 of the contract. One of the provisions which permitted the taking the work out of the builders' hands under that clause was in the case of an assignment of or charge on the contract moneys without the consent of the building owners. On October 28, 1898, and November 14, 1898, two charges were given on the contract moneys, the first to the Capital and Counties Bank, and the later one in favour of Belcher. Those were made with the consent of the building owners. It appeared afterwards that another had been made, of which they knew nothing. The works were not satisfactorily proceeded with, and were not completed, or anything like completed, on September 1, 1898. The builders got into financial difficulties, and ultimately became bankrupt. On February 1, 1899, the day they filed their petition, the building owners gave, or purported to give, notice under Clause 20 determining the contract, took the work out of the builders' hands, and completed it in accordance with the contract. It was suggested by the other side that that notice determining the contract was bad, but that had nothing to do with the determination of the case. On the same day, a receiving order was made against the builders. The building owners took over the works and they were completed under the superintendence of the architect. On June 27, 1901, a final certificate was granted by the architect, or two years and five months after the taking of the work out of the builders' hands. That certificate found that about 350*l.* was due to the trustee in bankruptcy of the builders. On July 1, 1901, the solicitors to the trustee wrote refusing to accept the certificate issued by Mr. Simpson on the ground that the builders had a large claim against the company for improperly determining the contract. That was the first intimation that any point was raised on the power of the building-owners to give the notice of February 1, 1899. The point having been raised, and there being other differences under the contract the building owners requested the architect to undertake the arbitration which he had to do under the contract, and to make his appointment for the purpose of entering upon it. The architect appointed July 23 for the first sitting. The trustee refused to acquiesce in the arbitration or to submit to the jurisdiction of Mr. Simpson as arbitrator. Before the proceedings were advanced any way the arbitrator was served with notice of an injunction granted by the Court restraining him from proceeding with the arbitration, and that injunction was granted upon a summons issued on behalf of Belcher, asking for the revocation of the submission to arbitration. That injunction was granted in Chambers on August 8, 1901. On November 4, 1901, the matter came before their lordships (*vide* the *Builder* of November 9, 1901), and that order revoking the submission was reversed. The ground upon which the Judge had proceeded was on a writ issued on behalf of Belcher, charging the architect with misrepresentation and fraud, reliance being placed upon a case which had been decided that where litigation was pending between one of the parties to the submission and the arbitrator, the Court would not allow the matter to proceed.

The Master of the Rolls said he remembered the case when it was before this court in November last.

Mr. Neville said that his Lordship was a member of the court then as well as Lord Justice Mathew.

The Master of the Rolls: If you do not like an arbitrator start an action against him.

Mr. Neville replied that that was what it came to. Since the decision in this court he need hardly say that Belcher's action against the architect had not been proceeded with further.

Mr. Bray did not agree with this statement.

Mr. Neville then read several letters which had passed between the solicitors of Belcher and the trustee in bankruptcy of the builders and the company to the effect that the arbitrator had no power to adjudicate on the matters in dispute. The arbitrator then proceeded with the arbitration, and on April 9, 1902, published his award, by which he found, after allowing for a sum due from the builders to the Company, a balance due to the builders of 779*l.* 1s. 8d., and that neither the trustee nor Belcher had any claim against the Company. On April 11, 1902, the Company took out a summons for leave to enforce the award, and on April 14, or three days later, Belcher issued a writ against the Company asking for a declaration that two contracts, dated February, 1897, made between the defendant Company and the builders, were wrongfully determined and repudiated by the Company, and by reason thereof the trustee became entitled to treat the contract as rescinded, and to be paid on a *quantum meruit*, and to recover from the Company the value of the plant lying on the site and wrongfully taken possession of by the Company. Thereupon the Company took out a further summons, seeking to stay this action. There were two contracts referred to in the writ. One was in relation to the drainage works at Roedean, carried out by a man named Field, and no arbitration proceedings had been taken under that contract at all. In their summons the Company asked to stay the proceedings with regard to that contract, and so far as that was concerned the order in chambers stayed the action, but left it in operation with regard to the building contract he (counsel) had called their lordships' attention to, and in respect of which the award was made. Mr. Justice Bucknill by the other order declined to give the Company leave to enforce the award. The learned counsel submitted that the award was perfectly right, and that the Company ought to be able to enforce it. If he was right in that submission Belcher had no right to continue his action or to attempt to go behind the findings of the arbitrator.

Mr. Bray, on behalf of the respondent, submitted that the orders of the learned judge should be affirmed. The whole of the builder's difficulties were brought about by reason of the company dishonouring the architect's certificates, on the ground that they had had notice of a charge on the moneys payable thereunder from some people called Cricklewood. That charge, however, was absolutely illegal. He submitted that a great wrong had been done to the builders and their creditors by the action of the company by giving the notice determining the contract, and by the building owners taking possession of the site. If the notice terminating the contract was wrongful, the builder's trustee had a good claim against the company to be paid on *quantum meruit* for work and labour done and materials supplied. If the company had by their own act prevented the builders from concluding the work under the contract, the whole contract had gone, and the builders would have the right to have the whole work measured up from the very beginning, and to be paid for it. The words of the contract were very general, and did not oust the right of the contractors to say that the building owners had repudiated the contract, and that therefore the contract had gone. He would assume that the building owners had the right to terminate the contract on the ground, say, that an execution was levied. But that execution was caused through the building owners not paying the contractors the money due to them under the certificates. Therefore, they could not take advantage of Clause 20, whatever the interpretation of it was, because the very thing which gave the arbitrator jurisdiction under that clause was caused by the building owner's default in payment of the money under the certificates. The learned counsel also contended that the award of the arbitrator was bad, because even if he had jurisdiction, he had exceeded it. The effect of the award was that Mr. Belcher had a decision against him that he was not entitled to anything from the company, and the only possible jurisdiction of the arbitrator was to deal with the rights between the builders and the company, and with nobody else's rights at all. The only other question was whether the action was an abuse of the process of the Court. The Master said it was not, and the learned Judge said it was not. He (counsel) submitted that this Court should not interfere in the circumstances of the case with the discretion exercised by the Master and the Judge.

Mr. Hudson, following on the same side, said that Mr. Belcher had never, in his character of mortgagee, presented any claim against the company, and that therefore the arbitrator had exceeded his jurisdiction in finding that there was nothing due to him.

The Master of the Rolls, in giving judgment, said it seemed obvious that all parties had consented to the arbitrator exercising jurisdiction to deal with the points which had arisen, and neither Belcher nor the trustee could now turn round and say that the arbitrator had no or had exceeded his jurisdiction. He thought, therefore, that the company should have leave to enforce the award, and that Mr. Belcher's action against the company should be stayed.

The Lords Justices concurred, and the appeal was accordingly allowed.

FLEET-STREET ANCIENT LIGHT DISPUTE.

THE case of Henry Pooley & Son, Limited, *v.* John Feemey & Co. came before Mr. Justice Joyce in the Chancery Division on the 3rd inst., on a motion by the plaintiffs for an extension of an interim injunction to restrain defendants from rebuilding No. 89, Fleet-street, in such a manner as to interfere with the ancient lights of the plaintiffs at No. 88, Fleet-street. The defendants' building was the *Birmingham Daily Post* London offices, the plaintiffs being the well-known weighing machine manufacturers.

Mr. Younger, K.C., when the case was called on, said that he appeared for the defendants, and as he had not had an opportunity of digesting the affidavits, or even of seeing some of them, he could not deal with the case then. The main cause of complaint was the alleged obstruction of a top window in the plaintiffs' building. If the defendants' building were completed the result would be that the light to that window would be obstructed by 23 deg. This room was used as a lumber-room.

Mr. Hughes, K.C., on behalf of the plaintiffs, did not agree with that statement of the learned counsel.

Mr. Younger said that the defendants held their building under an agreement from the Corporation of London, and under that agreement they were compelled to remove all scaffolding before Coronation day, so that if his lordship were to grant an injunction which would extend over that day without determining the question between the parties it would impose a very great hardship on the defendants. He suggested that both parties should consent to the case being expedited. If his lordship could see his way to take the case, say, on Tuesday next, and to hear the witnesses, it would be a great convenience to the defendants.

Mr. Hughes said that the plaintiffs would be willing and ready to try the case on Tuesday next.

Mr. Younger said that the injunction which was already granted was a very burdensome one on the defendants. It prohibited the defendants building higher than the old building on the site.

Mr. Hughes remarked that if his lordship was prepared to try the case next Tuesday it was not necessary to discuss the exact form of the interim injunction, although he would consent to modify it if thereby his clients could be adequately protected.

His Lordship: I will take the case on Tuesday next.

Mr. Younger: We will admit that the plaintiffs' top light is ancient. So no evidence need be called upon that point.

Mr. Hughes asked if the learned counsel would admit that the other lights of the plaintiffs were ancient.

Mr. Younger said he could not do that. Another action had been brought against defendants by the trustees of St. Brides' Church, Fleet-street, for the alleged obstruction of the light to the porch of the church. The writ was issued last Saturday and notice of motion for an interim injunction in that case had been given for Friday. The plaintiffs' solicitors in that case would be willing that his lordship should try both actions together. It referred to the same building, but it was, of course, a different obstruction

His Lordship: There can be no similarity between the two cases.

Mr. Younger: It is extremely desirable that both questions should be determined before Coronation day if possible. The action was in Mr. Justice Buckley's list.

His Lordship: Well, Mr. Justice Buckley can take it, I have no desire to try the case. The evidence must be entirely different.

Mr. Younger: As to obstruction. Yes.

His Lordship: Well, that is the point.

Mr. Younger: Mr. Justice Buckley requested your lordship to take it.

His Lordship: No, I shall not. It is an entirely different case.

Mr. Younger said that it would be a matter of very great convenience to the defendants if both cases could be dealt with before Coronation day.

His Lordship said he would not hear the second action. The other he would try next Tuesday.

The interim injunction already granted was continued over that day.

DRURY LANE THEATRE AND THE WORKMEN'S COMPENSATION ACT, 1897.

THE case of Burnett *v.* Drury Lane Theatre, Ltd., came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, on the 4th inst., on the appeal of the defendants (the employers) from an award of the County Court Judge of Shoreditch under the Workmen's Compensation Act, 1897.

It appeared that the applicant was a stage carpenter engaged at the theatre, and at the time of the accident was working near the centre of the stage at some scenery which was being erected for the purposes of a new play, a number of his fellow-workmen being engaged in cutting tumblers. The applicant, in the course of his work, stepped on one of the tumblers and fell, injuring his hand with a saw with which he had been working. It appeared that hydraulic machinery was being used for the sole purpose of raising and lowering a part of the stage with or without scenery upon it. The County Court Judge held that the place where the applicant was working was a "factory" within the meaning of the Act, and awarded him compensation under the provisions of the Act. Hence the present

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appeal of the defendants (the employers), on whose behalf it was contended that there was no evidence on which the County Court Judge could rightly hold that the place was a factory within the meaning of the Act.

At the conclusion of the arguments of counsel their lordships allowed the appeal, the Master of the Rolls observing that he did not think the hydraulic machinery used in the present instance brought the case within Section 93, Sub-Section 3, of the Factory and Workshop Act, 1878, or within Section 23, Sub-Section 1, of the Factory and Workshop Act, 1895. He accordingly thought there was no evidence on which the learned County Court Judge could hold that Drury Lane Theatre was a factory.

The Lords Justices concurred.

Mr. Arthur Powell, K.C., and Mr. A. Willis appeared as counsel for the appellants; and Mr. Cyril Dodd, K.C., and Mr. E. A. Jelf for the applicant (the workman).

HEAVY DAMAGES AGAINST BUILDERS FOR NEGLIGENCE.

THE case of Apperley *v.* Mark Patrick & Son came before Mr. Justice Phillimore, sitting without a jury, in the King's Bench Division last week, concluding on the 29th ult., an action brought by the plaintiff, the owner of No. 45, Great Marlborough-street, to recover from the defendants, a firm of builders, damages laid at 10,000*l.*

It appeared that the plaintiff, wishing to have his house pulled down and rebuilt, entered into a contract with the defendants for that purpose on January 10, 1900, by which the defendants agreed for a consideration to execute the works intended to be done in pulling down and rebuilding the house and premises in question. The contract provided that the defendants were to be responsible for loss, damage, or defects, and that they would have to make good the same, this provision applying not only to the building, "but also to the premises adjoining and contiguous, and also to the property nd person." Defendants also contracted to pull own, board, and shore up and clear away the whole of the then present buildings, the old party walls being retained, and were to "effectually shore and uphold all adjoining premises on all sides, consequent on the pulling down, and also to shore, as before, the party walls and the public way and other works, and to be responsible for the same and make good all damage, if any, and also to be responsible for all injury and damage, not only to property but to persons, and make good any work disturbed to roofs, flats, skylights, or other works of adjoining buildings consequent upon the works." Defendants performed the works under the contract, and the plaintiff's case was that they did not effectually shore or uphold the adjoining premises, and did not shore up the party-walls, the result of which was that the wall of No. 46, Great Marlborough-street, collapsed and fell down. In consequence of the damage to the adjoining premises, the tenants brought an action against the plaintiff and defendants, and recovered judgment for 4,286*l.* and costs, which sum plaintiff had paid. In addition to this the plaintiff had expended about 2,380*l.* in defending that action. He also, after the party-wall fell down, had to pay the London County Council 48*l.* for shoring up, and also 30*l* for architects' fees. In these circumstances plaintiff claimed from the defendants the damages before-mentioned.

Defendants by their defence denied that they had been guilty of negligence, and alleged that as they had acted under the orders of the plaintiffs' architect in the matter the architect was guilty of negligence in ordering them to do the work in question. Defendants denied that they were liable to pay to the plaintiff the sum of 4,286*l.* he had paid to the tenants of the adjoining property, as they had by agreement with the tenants, at their own cost, made good all loss, damage, and defects to the premises and ways adjoining to the property of the tenants. Whilst denying liability, defendants paid into Court 2,701*l.*, and said that that sum was sufficient to satisfy the plaintiff's claim, except as to the costs. Defendants also counterclaimed against plaintiff for the sum of 200*l.*, the balance they alleged to be due to them.

Mr. Macaskie, K.C., and Mr. A. M. Bremner appeared for the plaintiff; and Mr. R. B. D. Acland for the defendants.

Evidence was given that the wall collapsed owing to the action of the defendants and their workmen, and not by reason of any orders given for, or on behalf of the plaintiff.

Mr. A. F. Gruning, F.R.I.B.A., gave evidence to the effect that, when he saw the party wall it appeared to be a fairly sound wall. Although it was not a first-class wall, it was quite good enough to maintain. The holes that were cut in the wall at the base for bonding should not have been cut till the last moment. He thought the cause of the collapse of the wall was the crushing of the outer skin of the brickwork between the holes, the loss of material inside which ran down the holes. He should not have allowed the holes to have been cut in the way they had been cut. The wall was formed of two skins with bonds here and there. The wall collapsed straight down—telescoped. As it was an old wall, he thought extra shoring should have been put up when the holes for bonding were made.

Evidence of a similar nature was also given by Mr. Augustus E. Hughes and by Mr. Benjamin Tabberer, F.R.I.B.A., F.S.I., District Surveyor of Greenwich.

Mr. Acland, in opening the defence, said that the question for consideration was whether the surveyor made an error of judgment in allowing the party wall to stand or whether there was negligence on the part of the defendants. His submission was that the defendants were only liable to the extent of the breach of contract under their contract. Could it be said that cutting two holes 6 ft. wide in a 32 ft. wall was such negligence as to cast liability upon the builder. He submitted that the defendants had not been guilty of negligence in cutting these holes. The holes were properly cut, and he contended that if an initial error of judgment on the part of plaintiffs' surveyors had not been made the wall would have stood.

His lordship, after perusing the contract, said that if there had been a breach of contract and there was loss to the plaintiff defendants would be liable for that breach.

Mr. C. G. Patrick, one of the defendants, gave evidence as to tendering for the work and his tender being accepted. He acted on the instructions of Mr. Bartleet, plaintiff's architect. When they commenced to pull down the house they found that the farther they stripped the wall the greater the danger. As they got lower there was no improvement in the state of the wall. When they got just below the first floor there was the question of sustaining the chimney stack above, and plaintiff's architect directed him to put in a couple of steel joists and put brickwork upon them. This he did, and added a weight of some five tons to the top of the wall. Plaintiff's architect also protested that the wall could be kept up, in spite of the defendants' assertion that it was dangerous. After the holes had been cut at the base for the purpose of bonding, the wall fell. In his opinion there was nothing wrong in cutting the holes. He was certain that the wall fell owing to the five tons put on the top of the wall to support the chimney stack. The rotten part of the wall crushed. The holes had nothing whatever to do with the fall.

Further evidence was also given in support of the defendants' case by Mr. Willis, an architect and surveyor; Mr. Pattern, a builder; and Mr. A. Charles, an expert in regard to dangerous structures.

The counterclaim was not proceeded with, the plaintiff agreeing to pay to the defendants the sum claimed.

His Lordship, *in giving judgment*, said that the plaintiff claimed as against the defendants the money he had paid to somebody else in respect of the fall of the wall. The defendant, as contractor, had agreed with the plaintiff as building owner to be responsible for any loss, damage, or defects arising from accident, carelessness, or otherwise; also to make good any loss, not only to works, but to premises and ways adjoining. That being so, it appeared to him that there was no question for him to consider beyond that of the contract. He had no doubt that the defendants were responsible to the plaintiff under the contract, and the only other question he had to consider was the measure of damages. He thought that there was negligence on the part of the defendants and negligence which caused the accident. He did not impute any negligence to the defendants personally. Mr. Patrick had given his evidence in a very satisfactory manner, and had evidently intended to do everything that was right in the matter. Nor did he think that there was gross negligence on the part of anybody, but he was of opinion that there was negligence on the part of the defendants' foreman or bricklayer. He thought that the wall fell because of the holes that were made near its base. No doubt the wall was a bad wall, but his belief was that the final cutting of the holes brought the wall down, and he came to the conclusion that the wall fell because of the holes. There would be judgment for the plaintiff for the sum he had paid in respect of the wall, viz., 4,286*l.* and the costs, and the costs in the present action. There would be judgment for the defendants on the counterclaim for the 200*l.*, with such costs as they were entitled to on that. The 2,701*l.* which defendants had paid into Court would be paid out to the plaintiff in part satisfaction of his claim against defendants.

Judgment accordingly.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

2,118.—ELECTRICAL DISTRIBUTION: *B. Hopkinson.*—The batteries take up variations in the load, and the load on the generators remains constant in a system having storage batteries in parallel with the generators. A dynamo, which is driven at a substantially constant speed, is connected in series with the battery and has two small dynamos in its field circuit that are driven at a constant speed, one of them being supplied in part with current from generators that may be remote, whilst the other is wound so as to give a substantially constant potential. The windings are so arranged that the battery is charged or discharges accordingly with a diminished or increased load. Cells of the battery may be substituted for one of the small dynamos.

2,136.—A GUARD FOR A WOOD-PLANING MACHINE: *W. Wild and D. Rigby.*—A guard for revolving cutters is formed of a straight bar which is semicircular in cross-section. One end of it is sustained with a bolt having a head and a fly-nut for adjustment lengthwise. The guard is clamped with the bolt on to one arm at the end of a vertical screw that can be lifted or lowered by means of a hand-wheel; the end of a set-screw which fits in a slot in the vertical screw prevents rotation of the latter.

2,165.—MOULDINGS, CORNICES, &C.: *F. Scheck.*—These are fashioned by applying artificial stone, plastic cement, or some such material to skeletons made of wire cloth, pierced sheet metal, &c., and are to be secured in place with wire loops and hooks.

2,172.—A HOLDER FOR PAINTERS' BRUSHES: *W. Hartley.*—To a tang or socket at the end of a long handle is pivoted a plate on to which the brush-handle is fastened with clamps or tapered sockets. The clamping together of the plate and tang with a bolt and a wing-nut permits the holding of the brush at any angle required. Above the tapered sockets is arranged another clamp or socket for holding a scraper, putty-knife, or hose-pipe, and so on.

2,178.—A SHED FOR DRYING BRICKS.—*D. Sharp & E. Eatwell.*—A shed for the preliminary drying-process is constructed with crossed and open-ended flues from underneath it to perforated air-tubes, above which are steam-pipes that heat the current of air as it enters through the opened-work floor into the drying chamber. Steam pipes may be put inside the air-tubes, or the latter may be fitted with steam-jackets.

2,192.—A CONTRIVANCE FOR USE WITH GAS-METERS: *R. T. Glover.*—To the casing of a dry meter is affixed another casing, which encloses the registering mechanism. To the spindle of the meter mechanism is removably attached the arbor of the first wheel of the train, so that one need not open the meter for a removal of the registering mechanism at any time. The door of the register-casing is locked with a hasp, to be sealed in an outer case.

2,207.—AN APPLIANCE FOR MALT AND SIMILAR KILNS: *H. S. Taylor.*—The inventor devises passages for supplying auxiliary currents of heated fresh air that will mingle with the hot air and products of combustion flowing into the drying chambers, thereby economising both fuel and time. In the walls of a shaft that conveys gases from the furnace, and in those of the furnace he constructs channels, fitted with doors at the inlets, for currents of fresh air, which will thus become heated as they flow to the drying chamber.

2,210.—WINDOW HINGES: *T. McAllan.*—In order that sliding sashes may be turned inwards are provided hinges that can be separated, and one or both of the hinges are double-jointed. The opening of the window is facilitated by making the stop and parting beads as removable parts.

2,230.—MEANS FOR DISINFECTING CLOSETS: *C. Schinzer.*—Two pipes are set in communication between the flushing cistern and a retainer above it for the disinfectant. The lower end of one pipe will be uncovered whenever the cistern is emptied, and the disinfectant is then impelled through the other pipe by the air that flows into the retainer.

2,252.—SEATINGS FOR VALVES: *J. Hopkinson, J. Hopkinson & Co., and J. Lowis.*—A movable seating-ring, fastened with a retaining ring, is provided for sliding, safety, lift, and other kinds of valves. The retaining ring reposes upon a shoulder fashioned on the outside of the seating-ring, and a fixed ring or studs keep the retaining-ring in its place. In another form that ring is provided with wedge-shaped lugs which constitute a bayonet-joint with lugs upon the casing.

2,264. — MANUFACTURE OF LAVATORY AND SIMILAR BASINS: *S. H. Rowley, M. J. Adams, and T. Till.*—For rolling the plastic material over a rounded form or core, or within a hollow mould, the latter is placed between the carriers of a roller-mounted endless chain, whilst another endless chain causes the moulding roller to travel at the same speed as that of the mould, the shape of the roller is at first produced by running the mould beneath the soft roller, of which latter a plaster cast is then taken—the cast serving as a mould for the plaster pressing-roller. The roller may consist of two parts, or of only one, in the latter instance it is secured to the axle with forked metallic cramps having screwed shanks. By another adaptation a segmental metallic roller shell which is bolted on to flanged and radial frames upon the axle carries the die that presses the plaster. Confer also No. 11,805 of 1899.

2,276.—A LOCK FOR DOUBLE GATES AND DOORS: *C. E. Long.*—A sliding bolt, when shot, may be locked by means of an auxiliary lock upon the bolt, having a bolt in engagement with a shoulder in the bolt frame, door, or gate: a handle or a spring shoots the sliding bolt, or the operator may insert his finger through a slot in the casing into a hole cut in the bolt. The keyhole of the auxiliary lock may be either set so as to register with a keyhole in the casing when the sliding-bolt has been shot, or become uncovered when the lock is opposite the slot in the casing.

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2,279.—CONSTRUCTION OF SAFES WITH ELECTRICAL ALARMS: *P. Beau.*—A fireproof material compounded of Portland cement and lava, or some such fireproof sand, is laid in panels around the metallic skeletons which constitute the walls of the safe. An insulating sheet of asbestos is laid between the inner and outer skeletons, which are also joined together with asbestos-covered channel irons. The panels are formed by pressing layers of the compound with iron frames; they are then hardened by the application of double fluo-silicate of soda or potash. Electrical connexion between the walls and the metal of the door is effected through the contact with the corresponding skeleton of the door, which is set up by the connexion of a Z-shaped iron in the door-frame to the outer skeleton of the safe, whilst a spring upon the other skeleton establishes—at the shutting of the door—contact with a spring which is coupled to the other skeleton of the door. An alarm is founded when contact arises between the skeletons of the safe and door, which are coupled up to a battery, the alarm-bell being arranged in the circuit.

2,309.—A CONTRIVANCE FOR USE WITH WOOD-PLANING MACHINES: *F. Sagar and D. Sagar.*—For stripping or planing the wooden board at any angle desired a plate is attached to the side of the machine-table with bolts inserted through slots cut diagonal-wise; a screw will lift or lower the plate as it is moved length-wise in relation to the table, and when the plate is lifted it holds up the board at an angle.

2,365.—CLOSET AND OTHER BASINS, AND THEIR MOULDING: *M. F. Adams and S. H. Rowley.*—The inventors contrive that the flushing-rim of the basin of a urinal, closet, and so on shall be moulded in one piece with the basin by means of a projection which is made upon the mould; the opening, which may be left upon the inside of the rim, is closed with a strip of clay.

2,400.—MANUFACTURE OF PORTLAND CEMENT: *H. E. Ritsager*—The natural and undried materials are in the first place partly reduced and then pulverised together in tube mills with water just enough for yielding a thick sludge, which is dried or burned into clinker in rotatory kilns. The clinker, when ground, will constitute the cement.

2,412.—A FLANGE JOINT FOR SOIL-PIPES, WATER-CLOSET PAN SOCKETS, &c.: *F. W. Sutton* — A joint, which is claimed as being available for metallic pipes, and flush or ventilating nozzles or soil-pipes, and for the socket of a water-closet pan comprises two half-rings, gutter-shaped, and hinged at one end, their other ends being held together so that an entire ring is formed. The half-rings are filled with red lead and put around flanges of the pipe. A lipped hole upon one half-ring will engage with a hook upon the end of the other half-ring.

2,461.—CONDUITS FOR ELECTRICAL CONDUCTORS: *E. D. Page.*—For the conductors of wiring-plant for ceilings and walls are devised conduits or casings that consist of single or multiple metallic troughs which are severally divided by their raised middle portions through which the fastening screws are inserted. The sides of the trough are flanged for holding a lid of some flexible metal, and the flanges also are flexible in order to permit the lifting of any part of the lid.

2,463.—STAIR NOSINGS: *C. E. Knapp.*—A canvas lining is applied to a curved moulding of india-rubber for the nosings of stairs, and is nailed or tacked on to the tread and riser, recesses in the nosing take the edges of the stair covering.

2,481.—PROCESS OF MOULDING BRICKS: *C. Riedel and H. Schiegner.*—The die or mouthpiece of an extruding machine is lubricated with water conveyed through a cock at the inlet and an inclined or spiral winding grove formed in the die to a cock at the outlet. The contrivance is available for the moulding of bricks of stone or some similar plastic material.

2,482.—IMPROVEMENTS IN LAVATORY BASINS: *N. E. Cooke.*—The inventor fits on to the outlet of the basin a flanged ferrule and fastens it with a screwed collar, another collar is joined with rods to the flange. The tubular discharge valve and overflow pipe are arranged to slide in the latter collar. In the ferrule is a seating for the lower conical end of the tube, and a pin having an engagement either with a spiral groove or in the form of a bayonet-joint holds up the discharge valve.

2,500.—MATERIALS FOR PORTABLE BUILDINGS: *F. C. Jenkins.*—A framed and hollowed fireproof wall or partition-piece is made up of channel-bars in sheet-metal and plates of asbestos, or other suitable material, that are bolted to one another. Plates or strips are used to cover the interior vertical joints between the distance-pieces. For roofs are employed channelled rafters of sheet-iron and plates fastened with bolts and caps, angle-shaped weather-strips are inserted between the horizontal edges of the exterior wall-plates, and bent strips clamped between cross-binders and cover-strips render the horizontal joints waterproof.

2,510.—FLUSHING APPARATUS: *E. Katzenberger.*—A vertical rod within the bell joins it to a rocking lever. At the end of the pulling-device a spring is placed between the top of the bell and the inside of the cover, and the bell is set so as to work in a well (that may be easily detached), with apertures for the flow of the flush. The lifting of the bell by a pull upon the chain fills the bell, which, however, is pressed downwards by the spring so that the water is impelled over the crown of the siphon, and the flush is started.

2,516.—SCALES FOR PURPOSES OF COMPUTATION: *R. Procll.*—An upper graduated and transparent member and a graduated member consist severally of a logarithmical scale which is divided into lengths arranged the one over the other, whilst the two scales should be read the one from the bottom and the other from the top, though, in another form, the scales are set in the same direction. In line with the ends of the scales and divided from them by a distance which is equal to the depth of the scales are marked points which supplement the beginning and the ending points, respectively, of the two scales. For extraction of a square root one joins the number on the lower member by the edge of the lower member to a point either to the left or to the right, accordingly as a semicircle (which is marked, in alternation, at the right and left hand ends of the scale lines in the lower member) is to the left or right of the scale-line on which is the number, and one must choose the upper or lower point, accordingly as the number has an odd or an even number of digits: for instance, $\sqrt{3} = 1{\cdot}732$ will be indicated at the middle point of the line that joins three to one of the beginning points; $\sqrt{60} = 7{\cdot}75$ will be shown at the middle point of the line that joins sixty to another beginning point. The scales are also adjusted and divided for multiplication, division, and extraction of cube roots.

MEETINGS.

FRIDAY, JUNE 6.

Royal Institution.—Sir Benjamin Baker on "The Nile Reservoir and Dams." 9 p.m.

SATURDAY, JUNE 7.

Northern Architectural Association. — Students' Sketching Club Excursion.

MONDAY, JUNE 9.

Liverpool Architectural Society.- Special meeting: Discussion on the "Revised Charges of Architects." 6 p.m.

Royal Institute of British Architects.—Business meeting. 8 p.m.

SATURDAY, JUNE 14.

Incorporated Association of Municipal and County Engineers.—Midland District meeting, Wolverhampton. Assemble at Town Hall, 10.45 a.m.

Edinburgh Architectural Association. — Visit to St. Monan's Church, Fife.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 15.—By MILES & SON (at King's Lynn).
King's Lynn, Norfolk.—St. John's-ter., The Temperance Hotel, f., as a going concern £4,400

May 22.—By PROTHEROE & MORRIS (on the Estate).
Birchington, Kent.—Canterbury-rd., &c., twenty-nine freehold building plots (in lots) 1,305

By T. LAVINGTON (at Devizes).
Devizes, Wilts.—30 to 35, Estcourt-st., f., w.r. 100*l.* 2s. 6d. 1,000
Potterne, Wilts.—Furze Hill, four enclosures, 24 a. 3 r. 21 p., f. 1,200

May 23.—By PROTHEROE & MORRIS (on the Estate).
Pegwell Bay, Kent.—Main-rd, &c., seventy-two freehold building plots (in lots) 756

By W. TEAGLE & SONS (at Chippenham).
Christian Malford, Wilts.—Summerlands and 14 acres, f., p. 1,410

By DUNCAN & KIMPTON.
Wandsworth.—64, Merton-rd., u.t. 79 yrs., g.r. 6*l.*, w.r. 36*l.* 8s. 200
76 and 78, Merton-rd., u.t. 80½ yrs., g.r. 12*l.*, w.r. 72*l.* 16s. 510

By FISHER, STANHOPE, and DRAKE.
West Ham.—3 to 13 (odd), Morton-rd., u.t. 77 yrs., g.r. 30*l.*, w.r. 140*l.* 8s. 1,005

By GIDDY & GIDDY.
Brentford, Middx.—Marlborough Lodge and ¾ acre, f., p. 1,860

By E. HOLSWORTH.
Camden Town.—76, St. Paul's-rd., u.t. 48 yrs., g.r. 7*l.*, y.r. 45*l.* 410
42, St. Paul's-cres., u.t. 48 yrs., g.r. 5*l.*, y.r. 40*l.* 345

By GOODMAN & CROWTHER.
Battersea.—13 to 16, Havelock-ter., u.t. 60 yrs., g.r. 12*l.* 12s., w.r. 104*l.* 650
17 and 18, Havelock-ter., u.t. 60 yrs., g.r. nil, w.r. 52*l.* 420
33 to 42, Havelock-ter., u.t. 73 yrs., g.r. 45*l.* 10s., w.r. 270*l.* 10s. 1,635
Camberwell.—45, Lyndhurst-gr. (S), u.t. 74½ yrs., g.r. 9*l.*, y.r. 40*l.* 430
64, Southampton-st. (S), and 1, Westmacott-st., u.t. 54½ yrs., g.r. 10*l.*, w.r. 59*l.* 18s. 350
South Lambeth.—2, 4, 6, and 8, Bolney-st., u.t. 33 yrs., g.r. for 19 yrs. 6*l.* 16s., and thereafter 7*l.* 3s. 360

By F. & W. STOCKER.
Gray's Inn-rd.—1 to 13 (odd), 17 and 19, Ampton-st., u.t. 20½ yrs., g.r. 45*l.*, y.r. 502*l.* 3,360
2 to 16 (even), Ampton-st., u.t. 20½ yrs., g.r. 40*l.*, y.r. 440*l.* 2,820
1 to 4, Frederick-pl., u.t. 20½ yrs., g.r. 20*l.*, y.r. 225*l.* 1,450
5 and 6, Frederick-pl., and 29 and 31, Frederick-st., u.t. 20½ yrs., g.r. 15*l.*, y.r. 168*l.* 1,170
9 to 27 (odd), Frederick-st., u.t. 20½ yrs., g.r. 50*l.*, y.r. 546*l.* 3,730
Balham.—2, 4, 6, and 8, Elmfield-rd., f., y.r. 167*l.* 2,540

By G. A. WILKINSON & SON.
Shepherd's Bush.—Uxbridge-rd., &c., i.g. rents 100*l.* 4s., u.t. 7½ yrs., g.r. 32*l.* 15s., with reversion £1,100
Uxbridge-rd., The Wellington p.-h., i.g.r. 10*l.*, u.t. 7½ yrs., g.r. 5*l.* 55
City of London.—Red Cross-st., The Three Tuns p.-h., &c., f.g.r. 100*l.*, reversion in 85 yrs. .. 2,250
Red Cross-st., f.g.r. 63*l.*, reversion in 85 yrs. .. 1,250
Paper-st., f.g.r.'s. 262*l.*, reversion in 85 yrs..... 7,000
Clapton.—Lea Bridge-pl., The Ship Aground p.-h., f.g.r. 65*l.*, reversion in 61½ yrs..... 1,610
Lea Bridge-pl., f.g.r. 80*l.*, reversion in 61½ yrs. 2,150
Oxley-ter., f.g.r. 60*l.*, reversion in 68 yrs. 1,310
Russell-ter., &c., f.g.r. 20*l.*, reversion in 87 yrs. 550
Oak Cottages and British Oak b.-h., f.g.r. 45*l.* reversion in 58 yrs. 1,210
Alexandra-ter., f.g r.'s. 46*l.*, reversion in 95 yrs. 1,240
Chatsworth-rd., f.g.r. 40*l.*, reversion in 85½ yrs. 1,150
Hackney.—Wick-rd., c.g.r. 104*l.*, reversion in 78 yrs. 2,460
Wick-rd., &c., c.g.r.'s. 135*l.*, reversion in 51 and 53 yrs. 3,365
Clapton.—Upper Clapton-rd., c.g.r. 8*l.* 8s., reversion in 78 yrs. 200
Clapton.—Lea Bridge-pl., The India Rubber Works, area 12,900 ft., f., y.r. 100*l.* 1,750
Chatsworth-rd., freehold building land, with cottages thereon, area 1 a. 3 r. 35 p., p. 3,150
Hackney.—Clarence-rd., The Duke of Clarence p.-h., f., y.r. 90*l.* 2,200
80 to 90 (even), Clarence-rd., f., y.r. 174*l.* 2,650
1 to 8, Clarence-pl., f., y.r. 252*l.* 3,700
20, Clapton-sq., f., y.r. 52*l.* 730
39, Elsdale-st., f., y.r. 14*l.* 270

May 24.—By JACKSON & MASTERS (at Lymington).
Wootton, Hants.—The Rising Sun p.-h. and 14 a. 3 r. 27 p., f., e r. 70*l.* 2,300
Milton, Hants.—Two enclosures of land, 13 a. 2 r. 12 p., f. 830
Two enclosures of land, 5 a. 0 r. 30 p., f. 320

By W. DEW & SON (at Carnarvon).
Clynnog, Carnarvon.—The Tyn-y-Coed Estate, 284 a. 1 r., f. (in one lot)..... 6,150

By Fox & VERGETTE (at Huntingdon).
Broughton, Hunts.—White Hall and Mill Barn farms, 273 a. 0 r. 10 p., f. and c. (in one lot) . 4,950

By T. LAVINGTON (at Marlborough).
Fyfield, Wilts.—Ivy Cottage and 1 a. 2 r. 33 p., f. 440

By Messrs. MELLERSH (at Guildford).
Bramley, Surrey.—Part of Bramley Manor Farm, 41 a. 2 r. 7 p., f. 1,560

May 25.—By GEO. BILLINGS.
Hackney.—17, St. John's Church-rd., u.t. 68 yrs., g.r. 6*l.*, e.r. 38*l.* 360
Homerton.—25 to 35 (odd), Nesbit-st., u.t. 63 yrs., g r. 30*l.*, w.r. 132*l.* 12s. 530

By BRODIE, TIMBS, & Co.
Hampstead.—107, Finchley-rd., u.t. 43½ yrs., g r. 15*l.*, p. 910

By H. J. BROMLEY.
Forest Hill.—Forest Hill-rd., Woodville and 1¼ a., f., p. 2,250
176 and 178, Forest Hill-rd., f., y.r. 105*l.* 1,425

By ELLIOTT, SON, & BOVTON.
Brondesbury.—23, Cavendish-rd., u.t. 78 yrs., g.r. 15*l.*, p. 1,250

By FLEURET, SONS, & ADAMS.
Eastbourne, Sussex.—Cornfield-ter., The Sussex Hotel, with shop adjoining, f., p., with goodwill 19,100

By HOLLIDAY & STANGER
Streatham, Fairmile-av., Bonnie Cot, Limavady, and Rosslyn, u.t. 95 yrs., g.r. 22*l.* 10s., y.r. 116*l.* 1,745

By WM. HOUGHTON.
Buckhurst Hill.—High-rd., Ormonde House and The Chestnuts, area 10 a. 1 r. 20 p., f., p..... 7,500
Walthamstow.—Hale End-rd., a corner freehold hotel site 435
33, Higham-st., f., y.r. 20*l.* 16s. 300
Battersea.—Strath-ter., i.g.r. 15*l.* 5s., u.t. 62 yrs., g.r. 7*l.* 140

By BROWETT & TAYLOR.
Norwood.—213 and 215, Selhurst-rd., f., y.r. 170*l.* 2,400
247 and 249, Selhurst-rd. (s.), f., y.r. 160*l.* 2,360
196, Selhurst-rd., f., y.r. 60*l.* 810
216, Selhurst-rd. (s.), y.r. 48*l.* 800
Burgoyne-rd., two blocks of freehold land 1,105
Beckenham, Kent.—16, Linden-grove, f., w.r. 32*l.* 10s. 310

By G. PEARCE & SONS.
Hoxton.—74, 76, and 78, Shepherdess Walk (s.), and 5, Edmund's-pl., u.t. 40 yrs., g.r. 12*l.* 12s. y.r. 196*l.* 12s. 1,610
Brixton.—17 to 27 (odd), Talmer-rd., u.t. 72 yrs., g r. 34*l.* 10s., w.r. 192*l.* 10s. 1,965
36 to 42 (even), Barnwell-rd., u.t. 70 yrs., g r. 26*l.*, y.r. 188*l.* 14s. 1,315
Islington.—3, Devonshire-st., f., e r. 55*l.* 690

By W. W. READ & Co.
Paddington. — Eastbourne-mews, No. 3, "B Arch," u.t., 36½ yrs., g.r. nil, e r. 50*l.* 900

By THOMAS, PEYER, & MILES.
Eton, Bucks.—High-st., the Christopher Hotel, u.t. 31½ yrs., r. 200*l.* 150

By ALFRED RICHARDS (at Tottenham).
Tottenham.—55 and 57, Chestnut-rd., f., w.r. 63*l.* 695
Edmonton.—7 and 9, Chauncy-st., u.t. 72 yrs., g.r. 5*l.*, w.r. 36*l.* 8s. 915
7, Dartmouth-terr., f., w.r. 22*l.* 2s. 250

May 27.—By CHINNOCK, GALSWORTHY, & Co.
Holborn.—59 and 62, Leather-lane (S), f., y.r. 168*l.* 2,650
42 and 44, Hatton-wall (S), f., y.r. 130*l.* 2,600
58g, Hatton-gdn., f., y.r. 100*l.* 2,150
58h, Hatton-gdn. (S), f., y.r. 185*l.* 4,000
58h, Hatton-gdn. (S), f., y.r. 200*l.* 4,300
Gray's Inn-rd —Nos. 84, 84a, 86, and 86a (S), f., y.r. 297*l.* 10s. 4,800
Nos. 96, 96a, 98. and 98a (S), f., y.r. 301*l.* 5,200
Holborn.—Clerkenwell-rd., &c., Griffin Buildings (model dwellings), f., y.r. 325*l.* 5,000

By DEBENHAM, TEWSON, & Co.
City of London.—33 and 34, Monkwell-st. (warehouses), area 4,520 ft., u t. 63½ yrs., g.r. 220*l.*, y.r. 1,000*l.* 9,550
Chingford.—Forest View, freehold corner residence, y.r. 80*l.* 1,400
Ore, Sussex.—Old London-rd., Osborne House and 8 a o r. 36 p., f., p. 3,100

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By ROGERS, CHAPMAN, & THOMAS.
Fulham.—15, Maxwell-rd., u.t. 49 yrs., g.r. 6*l.*, y.r. 60*l.* £560
Brompton.—99 and 101, Ifield-rd., u.t. 50 yrs., g.r. 16*l.*, y.r. 144*l.* 600
South Kensington.—7, Westgate-ter., u.t. 50 yrs., g.r. 15*l.*, y.r. 80*l.* 460
26, Hereford-sq., u.t. 41½ yrs., g.r. &c, 23*l.*, y.r. 60*l.* 550

By RUTLEY, SON, & VINE.
Hampstead-rd.—42 and 44, William-st. (S.), u.t. 19 yrs., g.r. 12*l.*, y.r. 98*l.* 505
169, Stanhope-st., u.t. 36 yrs., g.r. 3*l.*, y.r. 55*l.* 570

By JOSEPH STOWER.
Regent's Park.—17, 18, 20, and 21, Eton-st, u.t. 50 yrs., g.r. 32*l.*, y.r. 178*l.* 1,800

By FRANK SWAIN.
Notting Hill.—16 and 18, Victoria-gdns, u.t. 56½ yrs., g.r. 8*l.* 10s., y.r. 88*l.* 1,010

By T. N. TURNER.
St. John's Wood.—1 to 8, Alexandra-mews, u.t. 55 yrs., g.r. 40*l.*, y.r. 280*l.* 4s. 1,800
Marylebone.—37, 39, and 41, Richmond-st., u.t. 35 yrs., g.r. 14s., y.r. 66*l.* 2s. 400
19 and 20, Weston-pl. and stable yard in rear, u.t. 35 yrs., g.r. 14s., y.r. 58*l.* 12s. 400

By WALTON & LEE.
Tenby, Pembroke. — St. Mary's, Waterwynch, and 43a. 1 r. 2 p., part f. and part u.t. 70 yrs., g.r. 25*l.*, p. 2,500

By FREDERICK WARMAN.
Highbury.—7, Highbury-quadrant, u.t. 47 yrs., g.r. 16*l.* 10s., e.r. 100*l.* 880
118, Highbury-hill, u.t. 75 yrs., g.r. 6*l.* 6s., e.r. 52*l.* 575
Crouch End.—2, 4, 6, and 8, Barrington-rd., u.t. 87 yrs., g.r. 28*l.*, y.r. 160*l.* 1,770
Canonbury.—39, Clephane-rd., u.t. 44 yrs., g.r. 1*l.*, y.r. 36*l.* 350
19, Marquess-rd., u.t. 43 yrs., g.r. 6*l.* 10s., y.r. 45*l.* 455

By A. W. TAYLOR & CO (at Putney).
Wandsworth. — Merton-rd., a block of freehold land, area 79,000 ft. 1,040
31, West Hill-rd., u.t. 48 yrs., g.r. 14*l.*, e.r. 70*l.* 285
Putney.—34 and 36, Charlwood-rd., u.t. 49 yrs., g.r. 10*l.* 10s., y.r. 82*l.* 740
103, Disraeli-rd., u.t. 62½ yrs., g.r. 6*l.*, e.r. 36*l.* 320
4 and 5, Colinette-rd., u.t. 73½ yrs., g.r. 39*l.*, e.r. 220*l.* 1,820

By LANGRIDGE & FREEMAN (at Tonbridge).
Wrotham, Kent.—Stagg's Hole House and 1 a. 0 r. 30 p., f. 300
Down-st House and 2 a. 1 r. 11 p., f. 920
Plaxtol, Kent.—Broadfield Farm, 43 a. 2 r. 8 p., f. 1,500
Little and Porter's Meads, 2 a. 3 r. 2 p., f. 125
Hadlow, Kent.—The Squirrels (land), 2 a. 1 r. 13 p., f. 120
East Peckham, Kent.—Common Mead, 0 a. 2 r. 17 p., f. 19
Plaxtol, Kent.—Reed House, f., p. 1,115
Hildenborough, Kent.—Fir Tree Lodge and 1¾ acre, f. 830

By HOLLIS & WEBB (at Leeds).
Askwith, Yorks.—Town Head Farm, 63 a. 2 r. 39 p., f. 3,000
A freehold holding, 5 a. 1 r. 30 p. 525
West Beck farm, 72 a. 0 r. 12 p., f. 3,015

By ORGILL, MARKS, & LAWRENCE (at Masons' Hall Tavern).
Dalston.—Lansdowne-rd, the Paget Arms p.-h., also 105, Albert-rd., u.t. 49 yrs., r. 136*l.*, with goodwill 8,600

By EDGINGTON & SONS (at Reading).
Reading, Berks. — Christchurch-rd., Mildmay Cottage, f., p. 685

By PALMER & SEDGWICK (at Axbridge).
Weare, &c., Somerset.—Upper Weare Farm, with various enclosures of land, about 168 acres, f. (in lots) 9,980

May 28.—By S. H. DAVIDS & CO.
Brompton.—7, 8, and 9, Montpelier-row, f., y.r. 112*l.* 1,810

By FLINT & PITT.
St. John's Wood.—30, 32, 34, and 36, Carlton-hill, u.t. 35 yrs., g.r. 42*l.*, y.r. 345*l.* 2,790
Barnes.—Lonsdale-rd., Heathbourne, u.t. 50 yrs., g.r. 10*l.*, e.r. 50*l.* 235

By HUMBERT & FLINT.
Kensington.—4, Addison-cres., f., y.r. 200*l.* 3,000
Bricket Wood, Herts.—The Old Brickfields and Juniper Wood, area 42 a., f., p. 2,500
Fulham.—Filmer-rd., Filmer-chambers (shops and flats), u.t. 87 yrs, g.r. 1*l.*, w.r. 202*l.* 16s. 1,200

By MABBETT & EDGE.
Westgate-on-Sea, Kent.—Canterbury-rd., Doon House (school) and 5 a. 1 r. 10 p., f., y.r. 422*l.* 7,700

By MANSELL & ROWE.
Ventnor, Isle of Wight.—High-st., f.g.r. 60*l.*, reversion in 980 yrs. 1,520

By MAY & PHILPOT.
Streatham.—56, Killieser-av., u.t. 78 yrs., g.r. 11*l.* 10s., p. 770

By STANLEY PARKES & BROWN.
Hornsey.—37, Raleigh-rd., u.t. 80 yrs., g.r. 6*l.* 10s., e.r. 32*l.* 325
5, Waldegrave-rd., u.t. 77 yrs., g.r. 6*l.*, y.r. 28*l.* 280
Wood Green.—38, 40, 44, 46, 48, and 50, Cobham-rd., u.t. 98½ yrs., g.r. 36*l.*, y.r. 168*l.* 1,530

By E. W. RICHARDSON & SON.
Muswell Hill.—1, Alexandra Pk.-rd., u.t. 93 yrs., g.r. 9*l.* 9s., e.r. 55*l.* 580

By R. TIDEY & SON.
Be Beauvoir Town.—12, 14, and 20, Church-rd., u.t. 11 yrs., g.r. 14*l.* 10s., y.r. 110*l.* 705
Finchley.—21, Leicester-rd., f., y.r. 30*l.* 500
Peckham.—25, Linden-gr., u.t. 46½ yrs., g.r. 7*l.*, p. 430

By DOUGLAS YOUNG & CO.
Notting Hill.—13, High-rd., area 4,480 ft., f., p. 2,625
Dulwich.—36 and 44, Alleyn-rd., u.t. 72 yrs., g.r. 2*l.*, e.r. 160*l.* 2,310
Brixton.—384 and 386, Coldharbour-lane (s.), u.t. 64 yrs., g.r. 10*l.*, y.r. 126*l.* 1,375
1, Belgrave-ter., u.t. 24 yrs., g.r. 9*l.* 10s., e.r. 50*l.* 310
13, Holland-rd., u.t. 12 yrs., g.r. 6*l.* 10s., w.r. 72*l.* 10s. 180
Camberwell.—75, Grosvenor-pk., u.t. 12½ yrs., g.r. 5*l.*, y.r. 36*l.* 170
Clapham.—39 and 39a, Jeffrey's-rd., f., y.r. 130*l.* 770
Streatham.—23 and 25, Ellison-rd., u.t. 53 yrs., g.r. 10*l.*, e.r. 64*l.* £500

May 28.—HUNTER & HUNTER.
Camden Town.—2, Hamilton-st., and 141 and 143, Bayham-st., u.t. 53 yrs., g.r. 6*l.* 6s., y.r. 103*l.* 150
Hampstead.—Rosslyn Hill, f.g.r's. 100*l.* 5s., reversion in 46½ yrs. 2,845
Rosslyn Hill, f.g.r's. 202*l.* 17s. 6d., reversion in 77½ yrs. 5,760
68 and 70, Rosslyn-hill (s.), f., y.r. 180*l.* 3,620
Branch Hill Side, f.g.r. 75*l.*, reversion in 70½ yrs. 2,060
10 to 15, Golden-sq., f., w.r. 114*l.* 1,200
The Gables, f.g.r's. 42*l.*, reversion in 71 yrs. 1,175
Vale Lodge, Vale House, and Vale Cottage, f., y.r. 112*l.* 1,850
Hatchet Bottom (garden ground), u.t. 802 yrs., g.r. 2*l.*, y.r. 4*l.* 175
Vale of Health, 5 freehold cottages, y.r. 141*l.* 1,980

By Messrs. SPELMAN (at Yarmouth).
Martham, Norfolk.—The Green, 3 freehold cottages 338
Somerton-rd., 2 enclosures, 13 a. 0 r. 26 p., f. .. 410
Somerton-rd., 2 freehold cottages 193
Hemsby, Norfolk.—Farmhouse and 20 a. 2 r. 38 p., f. and c. 750
Three pieces of building land, 6 a. 1 r. 5 p., c... 200

By HENRY HENDRIKS (at Birmingham)
Edgbaston, Warwick.—Poplar-av., plot of building land, area 11,139 yds, f. 1,300

By HEPPER & SONS (at Skipton)
Snaygill, Yorks.—The Bay Horse Inn and 2 a. 0 r. 2 p., f., y.r. 40*l.* 1,580
Close of meadow land, 5 a. 0 r. 29 p., f. 510
Various enclosures of land, 54 a. 3 r. 0 p., f. 2,340
High Bradley, Yorks.—Old Hall and New House Farms, 111 a. 1 r. 34 p., f. 1,610
Addingham, Yorks.—Street House Farm, 47 a. 1 r. 27 p., f. 1,900
New Allotment and Low and High Intakes, 25 a. 0 r. 21 p., f. 750

By SWAN WOODCOCK (at Stratford).
Leytonstone. — 5 to 15 (odd), Argyle-st., f., wr. 140*l.* 8s. 1,200
West Ham—47, Marcus-st., f., e.r. 28*l.* 300

By CUNNAH & ROBERTS (at Hooton).
Neston, Cheshire.—The New Farm, 91½ a., f. 6,025
Three freehold enclosures, 11 a. 0 r. 12 p. 775
Upland House and 12 a. 2 r. 37 p., f. 935
A freehold field, 2 a. 2 r. 17 p. 235

May 29.—By Messrs. CRONK.
Sevenoaks, Kent.—Bradbourne-pk.-rd., a building site, 2 a. 3 r. 3 p., f. 980

By E. H. HENRY.
Clapham Common.—2, Cedars rd., f., p. 1,800
Wandsworth Common.—51, West-side, f., p. 860

By HAMPTON & SONS.
Southend-on-Sea, Essex.—8 to 18, 22 to 28 (even), and 32, London-rd., f., w.r. 635*l.* (in lots) 10,800

By W. MARTIN & CO.
Dulwich.—3, Glengarry rd., u.t. 78 yrs., g.r. 7*l.*, e.r. 36*l.* 350

By NEWBON, EDWARDS, & SHEPHARD.
Pimlico.—5, Warwick-sq., u.t. 32 yrs., g.r. 1*l.*, y.r. 155*l.* 1,570
St. Luke's.—50, Gee-st., f., y.r. 31*l.* 16s. 500
Camden Town.—Gt. College-st., i.g.r. 15*l.* 10s., u.t. 27 yrs., g.r. nil 190
Kentish Town.—123, Leighton-rd., u.t. 38½ yrs., g.r. 5*l.* 5s., w.r. 70*l.* 16s. 380
6 and 7, Leighton-grove, u.t. 38½ yrs., g.r. 10*l.*, w.r. 130*l.* 12s. 720
Holloway.—Fonthill-rd., f.g.r.'s 28*l.*, reversion in 62 yrs. 760
519 and 523, Liverpool-rd., f., y.r. 75*l.* 980
Oxford-st.—13, Berwick-st. (S.), f., y.r. 130*l.* 3,275
Stratford.—Western-st., f.g.r.'s 20*l.*, reversion in 59 yrs. 475
St. Pancras.—Aldenham-st., f.g.r.'s 30*l.*, reversion in 59 yrs. 680

By MORLEY PHILLIPS, SONS, & MARTIN.
Edgware-rd.—No. 72 (S.); also 12, Stourcliffe-st.; profit rentals of 100*l.* for 19 yrs. and 48*l.* for 30 yrs. 1,400

By MARTIN VIGERS.
Regent's Park.—5, St. Edmund's-ter., u.t. 22 yrs., g.r. 2*l.*, p. 300
By WHITE, DRUCE, & BROWN.
St. John's Wood.—12, Abbey-rd., u.t. 15 yrs., g.r. 10*l.*, y.r. 70*l.* 615
23 and 24, Elm Tree-rd., and 18, Grove End-rd.. u.t. 15 yrs., g.r. 15*l.* 15s., y.r. 110*l.* 860
20, Grove End-rd., u.t. 15 yrs., g.r. 15*l.* 15s., y.r. 80*l.* 550
31, Grove End-rd., u.t. 15 yrs., g.r. nil, y.r. 80*l.* 670
Grove End-rd., &c, f.g.r. 15*l.* 15s. reversion in 14 yrs. 1,405
Marylebone.—58, Church-st. (S.), and 61, Carlisle-st., u.t. 19½ yrs., g.r. 12*l.*, y.r. 90*l.* 625
Little Carlisle-st., &c., i.g.r. 25*l.*, u.t. 19½ yrs., g.r. nil 200
Maida Hill.—17 and 18, Aberdeen-pl., u.t. 21 yrs., g.r. 40*l.*, y.r. 80*l.* 385
Ealing.—28, Castlebar-rd., f., p. 750

By BARKERS'.
Leytonstone.—56, Beechcroft-rd., f., e.r. 28*l.* 300

By H. J. BLISS & SONS.
Hackney.—45 to 51 (odd), Morning-lane, u.t. 71½ yrs., g.r. 20*l.*, y.r. 120*l.* 1,065
Bethnal Green.—1 to 9, Parliament-pl., f., w.r. 133*l.* 4s. 1,175
Poplar.—272, High-st., f., y.r. 30*l.* 405
Ilford.—High-rd., f.g.r. 34*l.*, reversion in 92 yrs. 930
Mile End.—33, Globe-rd., and 1, Willow-st., f., w.r. 49*l.* 8s. 555
6 and 7, North-st., f., w.r. 49*l.* 8s. 450
27 and 29, Hunt-st., f., w.r. 70*l.* 4s. 875
St. George's, East.—St. George's-st., The Bunch of Grapes p.-h., f., y.r. 50*l.* 820
Enfield Highway.—High-rd., freehold house and shop, and six cottages, also The Rose and Crown Yard and land adjoining, w.r. 82*l.* 4s. 950

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; w.r. for weekly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 11 0	per 1,000	alongside, in river
Rough Stocks and Grizzles	1 9 0	,,	,, ,,
Facing Stocks	2 12 0	,,	,, ,,
Shippers	2 5 0	,,	,, ,,
Flettons	1 8 0	,,	at railway depôt.
Red Wire Cuts ..	1 12 0	,,	,, ,,
Best Fareham Red	3 12 0	,,	,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,,	,, ,,
Do., Bullnose	4 11 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 6 0	,,	,, ,,
GLAZED BRICKS			
Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers..	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	20 0 0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers..	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints.....	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed....	8 0 0		less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	31 0	per ton, delivered
Best Ground Blue Lias Lime..	25 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 10s. 6d. per yard, delivered
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
Ancaster in blocks	1 11	per ft. cube, deld. rly. depot.	
Bath ,, ...	1 7	,,	,,
Farleigh Down Bath ..	1 8	,,	,,
Beer in blocks	1 6	,,	,,
Grinshill ,, ...	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale in blocks..	2 4	,,	,,
Red Corsehill ,,	2 5	,,	,,
Closeburn Red Freestone	2 3	,,	,,
Red Mansfield ,,	2 4	,,	,,
Hard York in blocks ..	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt.	
,, ,, 6 in. Rubbed Ditto..	3 0	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 2 in. self-faced Ditto	0 9½	,,	,,
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt.	
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.	
,, ,, ,, 3 in. do.	1 2½	,,	,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	12 0 0	per 1000 of 1200 at ry. dep.
,, best seconds ,,	11 10 0	,, ,,
16×8 best ,,	6 17 6	,, ,,
20×10 best blue Portmadoc ..	11 7 6	,, ,,
16×8 best blue Portmadoc	6 5 0	,, ,,
20×10 best Eureka unfading green....	13 10 0	,, ,,
16×8 ,, ,,	7 10 0	,, ,,
20×10 permanent green	10 10 0	,, ,,
16×8 ,, ,,	6 0 0	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles..41	6	per 1,000, at rly. depôt.
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,

[*See also page 577.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums	Designs to be delivered
*Memorial to Queen Victoria at Allahabad	The Committee	2,000 Rupees	Nov.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Detached Houses and Shops, Enfield		Crukmay & Sons, Architects, 13, Victoria-street, S.W.	June 5
*Baths and Washhouses, Mansfield, Haggerston	Shoreditch Borough Council	A. W. S. Cross, 58, Conduit-street, Regent-street, W.	June 7
Artisans' Dwellings, Walker-road, &c.	Newcastle-on-Tyne Corporation	Liddle & Brown, Architects, Newcastle	June 10
Brick Culvert, Coventry-street, &c.	Nuneaton U.D.C.	J. S. Pickering, Civil Engineer, Council Offices, Nuneaton	do.
Hospital, Rhiwfelen, Fawr	Llantrisant R.D.C.	G. S. Morgan, Surveyor, School-street, Pontyclun	do.
Twenty-eight Houses, Abercynon		W. Dowdeswell, Architect, John-street, Treharris	do.
School, Heaton	Newcastle-upon-Tyne Sch. Board	S. D. Robins, Architect, Percy-street, Newcastle	do.
Sewers, &c.	Bridgwater (Somerset) Tn. Council	Borough Surveyor, Municipal Buildings, Bridgwater	do.
Banking Premises, &c., Darlington	North-Eastern Banking Company	Clark & Moscrop, Architects, Darlington	do.
Rebuilding Shops, &c., Fore-street, Redruth	Messrs. T. Moore & Co.	S. Hill, Architect, Green-lane, Redruth	June 11
Alterations to Premises, Bishop Auckland	Mr. A. Guthrie	F. H. Livesay, Architect, Bishop Auckland	do.
Villas, Pencisely-road, Cardiff	Pencisely Estate Co., Ltd.	P. E. Hill, Surveyor, 23, St. Mary-street, Cardiff	do.
Additions to Oakville, Oxford-road, Dewsbury		J. Kirk & Sons, Architects, Dewsbury	do.
Laundry, Stabling, &c., Dowlais, S. Wales		W. Dowdeswell, Architect, Treharris	do
Workshops, &c., Spring Hill, Accrington		H. Ross, 15, Cannon-street, Accrington	do.
Cottage, Aspatria		W. Sanderson, 45, Park-road, Aspatria	do.
Additions to Church, Allerton Bywater		A. Hartley, Architect, Castleford	do.
Bakery, &c., North Shields	Mr. P. Brown	F. R. N. Haswell, Architect, 77, Tyne-street, North Shields	do.
*New Schools	Salford Corporation	Benjamin Bower, 14, Temple-street, Birmingham	do.
Shop Premises, Fore-street, Redruth		S. Hill, Architect, Green-lane, Redruth	do.
Schools, Blackfriars-road	Salford Corporation	B. Bower, 14, Temple-street, Birmingham	do.
Asylum Chapel, Omagh		J. L. Donnelly, Architect, Omagh	June 12
*Laying New Flooring, St. George's Workhouse	Southwark Union	G. D. Stevenson, Architect, 13 & 14, King-street, E.C.	do.
Church Restoration, Greetham, near Horncastle		C. H. Fowler, Architect, Durham	do.
Additions, &c., to National Schools, Bingley		W. R. Nunns, Architect, Market-street, Bingley	do.
Pavilion at Sanatorium, Bear-road, Brighton		F. J. C. May, Civil Engineer, Town Hall, Brighton	do.
House, Brigshaw-road, Allerton Bywater, Yorks	Mr. G. Johnson	A. Hartley, Architect, Castleford	do.
Villa, Shantallow, Londonderry	Mr. F. M'Laughlin	J. P. M'Grath, Architect, 28, Carlisle-road, Londonderry	do.
Boiler House, &c., at Workhouse, Clayton	North Bierley Guardians	S. Spencer, Architect, Great Horton-road, Bradford	do.
Underground Convenience, Victoria-street	Manchester Corporation	City Surveyor, Town Hall, Manchester	June 13
Laundry, &c., at School, Wapping-road	Bradford School Board	Clerk, School Board Offices, Manor-row, Bradford	do.
School, Lapage-street	do.	T. Garbutt, School Board Offices, Manor-row, Bradford	do.
Mill, &c., Snake Hill, Brighouse		G. Hepworth, Architect, 20, Bradford-road, Brighouse	do.
House, Fernhurst-road, Cork		W. H. Hill & Son, Architects, 28, South Mall, Cork	do.
Five Houses, Norfolk-road, Carlisle		Johnstone Bros., Architects, Lowther-street, Carlisle	June 14
School, Skewen, Wales	Coedfranc School Board	J. C. Rees, Architect, St. Thomas Chambers, Neath	do.
Culvert, Ford Valley, Devonport		A. B. Pilling, Town Hall, Devonport	do.
Schools, Idle, near Bradford		Kay & Long, Architects, 10, St. Paul's-street, Leeds	do.
Additions to School, Loddon, Norfolk	Hales, &c., School Board	A. Pells, Architect, Beccles	do.
Water Supply Works, Boldron, near Barnard Castle	Startforth R.D.C.	J. E. Parker, Civil Engr., Post Office Chmbrs., Newcastle-on-Tyne	do.
Reservoir, Cwmtillery	Abertillery U.D.C.	T. Rees, Civil Engineer, Corn Exchange Chambers, Newport, Mon	do.
Chapel, &c.	Hadley (Salop) Parish Council	G. R. Dalgleish, Architect, Talbot Chambers, Shrewsbury	do.
Additions to Chapel, Cwmaman, Wales		T. Roderick, Architect, Clifton-street, Aberdare	June 16
*Sewerage and Road-making Works	Hornsey U.D.C	Council's Engineer, Southwood-lane, Highgate, N.	do.
Additions to Public Baths	Mansfield Corporation	R. F. Vallance, Borough Surveyor, Town Hall, Mansfield	do.
Alterations to Town Hall	do.	do.	do.
Chimney Shaft, &c., High-street	Worthing Corporation	Borough Surveyor, Municipal Offices, Worthing	do.
Water Supply Works, Bovey Tracey	Newton Abbot R.D.C.	W. Fox & R. Tatton, Civil Engineers, 5, Victoria-street, S.W.	June 17
*Dwellings for Working Class	St. Pancras Borough Council	Keith D. Young, Architect, 17, Southampton-street, W.C.	do.
House, Shop, &c., Red Row, Broomhill	Co-operative Society	T. Tulip, Whinney Hill, Choppington	do.
Cast Iron Pipes (120 tons)	Newton Abbot R.D.C.	Fox & Tatton, Civil Engineers, 5, Victoria-street, S.W.	do.
Five Shops, Hall, &c., Chapel-street	Rugby Co-operative Society	J. T. Franklin, Architect, Regent-street, Rugby	do.
*Erection of Dwellings for Working Classes	London County Council	Architect's Department, 19, Charing Cross-road, S.W.	do.
*Reconstruction of Hadham Mill Bridge	Herts County Council	Urban A. Smith, 41, Parliament-street, S.W.	June 18
Chapel, Rhos, near Ruabon		R. Owens & Son, Architects, 3, Crosshall-street, Liverpool	do.
Alterations, Holmfield, Halifax	Hull Corporation	F. Fielding, Architect, 7, Fountain-street, Halifax	do.
Rebuilding Empress Inn, Alfred Gelder-street	Fulham Borough Council	J. H. Hirst, Architect, Town Hall, Hull	do.
*Making-up and Paving Streets, &c.	Bristol Corporation	Council's Surveyor, Town Hall, Fulham, S.W.	do.
Culvert, Broadweir	Hampstead Borough Council	T. H. Yabbicom, Civil Engineer, 63, Queen-square, Bristol	do.
*Wood Paving Works	Ealing Local Board	Council's Engineer, Town Hall, Haverstock Hill, N.W.	June 19
*New Branch Library, West Ealing	do.	Council's Engineer, Town Hall, Ealing	do.
*Making-up Roads	Fulham Guardians	do.	do.
*Engine and Accumulator Rooms, Boiler Settings, &c.	Hampstead Borough Council	F. H. Medhurst, Engineer, 13, Victoria-street, S.W.	do.
*Public Conveniences, South End Green	The Committee	Borough Engineer, Town Hall, Hampstead, N.W.	do.
*New Church, Badshot Lea, near Aldershot	Pontefract Town Council	Mission Church, Badshot Lea	do.
Sewerage Works	Acton District Council	Baldwin Latham, Civil Engineer, Victoria-street, Westminster	June 21
*Public Baths	County Borough West Ham	Council's Surveyor, 242, High-street, Acton, W.	June 24
*Making-up Janet, &c., Roads	South Stoneham R.D.C.	Borough Engineer, Town Hall, West Ham, E.	do.
*Stoneware, &c.	Metropolitan Asylums Board	Bailey-Denton, Son, Lawford & Symons, Palace-chmb. Westminster	July 7
Convalescent Hospital at Carshalton		Treadwell & Marten, 2, Waterloo-place, Pall Mall, S.W.	July 16
Additions to Schools, Cockermouth		G. Dale Oliver, Architect, Cockermouth	No date
Bridge over River Lune, Gaisgill, Westmorland		J. Bentley, County Surveyor, 7, Lowther-street, Kendal	do.
Villa, Green-street, Sittingbourne		—, Lucas, Albert House, Teynham, Sittingbourne	do.
Bridge Works	Wetherby (Yorks) R.D.C.	J. House, Engineer, Montpellier Chambers, Harrogate	do.
*Nurses' Home, Southampton	Royal South Hants, &c., Hosp. Com.	Ruault & Young, 17, Southampton-street, W.C.	do.
Relaying Gas Main, 900 yards	Sheppy Gas Co.	H. Barber, 2, Trinity-road, Sheerness	do.
Alterations, Highfield House, Hardwick Mount, Buxton	Mrs. G. Hobson	Garlick & Flint, Architects, Buxton	do.
Granite Road Metal	Loughborough (Leics.) Corporation	A. H. Walker, Civil Engineer, Town Hall, Loughborough	do.
Additions to Cemetery	Brinklow (Coventry) Prsh. Council	H. Newitt, Council Offices, Brinklow	do.
Church, St. Ann's Well-road, Nottingham		A. E. Lambert, Architect, 22, Park-row, Nottingham	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Engineering Assistant	Acton U.D.C.	135*l.*	June 10
*Temporary Sanitary Engineer	Chelsea Guardians	3*l.* 10s. per week	June 11
*Assistant	County Borough West Ham	130*l.* per annum	June 14
*Clerk of Works	St. Pancras Borough Council	3*l.* 10s. per Week	June 17
*Clerk of Works	Beckenham U.D.C.	3*l.* per week	June 21
*Assistant Engineer	Rangoon Municipality	See Advertisement	July 3
*Temporary Assistant	Battersea Borough Council	Not stated	No date

Those marked with an asterisk (*) are advertised in this Number. *Competition, p. iv.* *Contracts, pp. iv. vi. viii. & x.* *Public Appointments, xx. & xxi.*

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PRICES CURRENT (*Continued*).

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14 10 0	16 0 0
Deals: best 3 by 9	13 10 0	15 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	10 10	11 10 0
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	„ „ „
2 in. by 4 in. and 2 in. by 6 in.	8 10 0	9 10 0
2 in. by 4½ in. and 2 in by 5 in.	8 0 0	9 0 0
Foreign Sawn Boards—		
1 in. by 12 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	„
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft.	
Seconds	4 10 0	5 0 0
Small timber (8 in. to 10 in.)	4 5 0	4 10 0
Swedish balks	3 12 6	3 15 0
Pitch-pine timber (30 ft.)	2 15 0	3 0 0
	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
„ „ 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 0 0	15 0 0
„ „ „ 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
„ „ „ 3 in. by 9 in.	12 0 0	13 0 0
„ „ „ battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 1	0 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 0
Small „ „	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
¾ in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
1 in. by 7 in. white, planed and shot	0 11	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6

6 in. at 6d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders „ „	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London £ s. d.	£ s. d.
IRON—		
Common Bars	7 15 0	8 5 0
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 10 0
„ „ galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
„ „ to 24 g.	11 0 0	- - -
„ „ to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	- - -
„ „ 22 g. and 24 g.	13 5 0	- - -
„ „ 26 g.	14 5 0	- - -

PRICES CURRENT (*Continued*)

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Sheet Iron, Galvanised, flat, best quality:—		
Ordinary sizes to 20 g.	16 0 0	- - -
„ „ 22 g. and 24 g.	16 10 0	- - -
„ „ 26 g.	18 0 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
„ „ 22 g. and 24 g.	13 5 0	- - -
„ „ 26 g.	14 5 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 0 0	- - -
„ „ 22 g. and 24 g.	13 0 0	- - -
„ „ 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 5 0	9 15 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 2 6	- - -
Pipe in coils	14 12 6	- - -
Soil Pipe	17 2 6	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 10 0	- - -
Silesian	24 0 0	- - -
COPPER—		
Strong Sheet per lb	0 0 10	- - -
Thin „	0 0 11	- - -
Copper nails „	0 0 11	- - -
BRASS—		
Strong Sheet „	0 0 10	- - -
Thin „	0 0 10½	- - -
TIN—English Ingots „	0 1 5	- - -
SOLDER—Plumbers' „	0 0 7	- - -
Tinmen's „	0 0 9	- - -
Blowpipe „	0 0 10½	- - -

ENGLISH SHEET GLASS IN CRATES.

	£ s. d.
15 oz. thirds	2½d. per ft. delivered.
„ fourths	2d. „ „
21 oz. thirds	3d. „ „
„ fourths	2¾d. „ „
26 oz. thirds	4¼d. „ „
„ fourths	3¾d. „ „
32 oz. thirds	5¼d. „ „
„ fourths	4¾d. „ „
Fluted sheet, 15 oz.	3d. „ „
„ 21 „	4d. „ „
¼ Hartley's Rolled Plate	1¾d. „ „
5/16 „ „ „	2¼d. „ „
⅜ „ „ „	2¾d. „ „

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes or barrels per gallon	0 2 11
„ „ „ in drums „	0 3 2
Boiled „ „ in pipes or barrels „	0 3 1
„ „ „ in drums „	0 3 4
Turpentine, in barrels „	0 2 11
„ in drums „	0 3 1
Genuine Ground English White Lead per ton	21 0 0
Red Lead, Dry „	20 0 0
Best Linseed Oil Putty per cwt.	0 8 6
Stockholm Tar per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 0
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 0
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ABERDARE.—For the erection of two houses, stable, &c., Currie-st., &c., Aberaman. Mr. Fisher Thomas, architect, Pontypridd:—

Wm. Evans, Aberaman	£574

AXBRIDGE (Somerset).—For the erection of infirmary buildings, for the Guardians. Mr. A. Powell, C.E., 3, Unity-street, College-green, Bristol:—

Stephens, Bastow, & Co.	£6,997 0	Ford & Sons	£6,045 15
Wills & Sons	6,970 0	C. Addicott, Weston-super-Mare*	5,720 0
H. B. Neal	6,886 0	C. Bryer	5,680 0
A. J. Bevan	6,300 0	A. J. Colborne	5,568 8
Sollard	6,200 0	G. Sprake	5,523 0
Walters	6,200 0		

BARROW-IN-FURNESS. — For the erection of a fish market, for the Corporation. Borough Engineer, Town Hall, Barrow:—

T. Brown, Barrow	£1,470

BOSTON (Lincs.). — For additions, &c., to fever hospital, Skirbeck, for the Urban District Council. Mr. Jas. Rowell, architect, Borough Offices, Boston:—

J. W. Pinder	£458 0 0	Wm. Greenfield	£425 0 0
Hipwell & Co.	438 0 0	T. H. Cade	409 10 0
J. Leafe	427 14 3	J. Lucas, Boston*	390 0 0

BRIDLINGTON.—For the erection of a residence for Mr. F. Creaser. Mr. J. Earnshaw, architect, Carlton House, Bridlington:—

E. Corner	£1,085 10 0	W. A. Storr	£828 0 0
T. Spink	970 0 0	A. Wilis	808 0 0
J. H. Hudson	927 10 0	F. Flintoft	755 0 0
A. Gardam	883 17 6	J. Rinnard	625 0 0
A. Booth	860 0 0	T. Gray*	612 0 0
F. Kneeshaw	847 0 0		

[All of Bridlington.]

CEFN (Wales).—For the erection of house and shop, Well-street, for Mr. Bowen. Mr. J. W. Hughes, architect, Dee Hurst, Llangollen:—

J. T. Jones, Cefn, Ruabon*	£525

CHARMINSTER (Dorset).—For the erection of a house for 100 private patients at Herrison, near Dorchester, for the County Council. Mr. George T. Hine, architect, 35, Parliament-street, S.W.:—

Wills & Sons	£49,880	Willcock & Co.	£42,750
Pethick Bros.	46,944	Parnell & Sons	42,204
Wakeham Bros.	46,514	J. M. Patrick	41,732
Pattinson & Sons	46,500	Stephens, Bastow, & Co.	41,693
E. C. Bull	46,368	W. A. Blake	39,957
King & Sons	44,432	Moss & Sons, Ltd., Loughborough†	39,500
Jenkins & Sons, Ltd.	43,000		
W. J. Bloxham	43,497		

CHELTENHAM.—For the erection of a chalet, Pittville Park, for the Corporation. Mr. Joseph Hall, M.Inst.C.E., Borough Surveyor, Municipal Offices, Cheltenham:—

Collins & Godfrey	£385	A. C. & S. Billings, Cheltenham*	£375

GOSPORT.—For the erection of a Congregational church, Locks Heath. Mr. R Lowe, C.E., architect, 57, Gordon-road, Gosport. Quantities by the architect:—

G. H. Hackett	£1,180	Lane Bros.	£1,050
R. W. Lowe	1,111	J. Hunt	1,015
R. M. Middelton	1,099	W. T. Dugan	991
Lear & Son	1,090	J. Cload	950
		C. M. Dash*	898

[Architect's estimate, £907 12s. 10d.]

KEIGHLEY.—For the erection of laundry buildings, house, stabling, &c., Riddlesden. Mr. Henry Smith, architect, Compton Buildings, Keighley. Quantities by Henry Smith:—

Masonry.—W. Baker, Keighley*	£414 0 0
Joinery.—J. Hartley, Keighley*	123 0 0
Plumbing.—W. Bottomley, Keighley*	57 0 0
Slating.—W. Thornton, Bingley*	46 0 0
Plastering.—A. Sawley, Keighley*	20 3 0
Painting.—T. Harrison, Keighley*	6 13 4

LONDON.—For alterations and additions to West Hill Lodge, Sydenham. Mr. J. Randall Vining, architect, 89, Chancery-lane, W.C.:—

Black & Son	£521	J. & C. Bowyer*	£465
Marsland & Son	497		

LONDON.—For the erection of a disinfecting chamber, stabling, &c., at Wanless-road, Loughborough Junction, for the Lambeth Borough Council. Mr. Henry Edwards, C.E., Borough Engineer:—

	Disinfecting Chamber.	Stabling.
Foster Bros., Norwood Junction	£3,136	£924
Chenum & Sons, West Norwood	2,718	960
G. Parker, Peckham	2,575	995
B. E. Nightingale, Albert Embankment	2,568	875
Smith & Son, South Norwood	2,525	893
Rice & Son, Stockwell-road	2,517	918
J. Parsons, Waterloo-road	2,500	887
T. G. Minter, Page-street	2,487	900
J. O. Richardson, Peckham	2,486	884
Edwards & Medway, Kennington-road	2,484	870
Whitehead & Co., Clapham-rd.	2,450	895
Lowden & Sons, Upper Tooting	2,433	900
T. G. Sharpington, Nunhead	2,288	888
J. Ham, Denmark Hill	2,192	885

MANCHESTER.—For the erection of a house, Didsbury, for Dr. Geo. E. Crowe. Messrs. C. K. & T. C. Mayor, architects, 41, John Dalton-street, Manchester:—

Padmore & Sons	£1,652	Burgess & Galt	£1,430
McFarlane & Son	1,565	Amos Mason, Didsbury*	1,385
Megarity & Co.	1,546	R. Carlyle	1,377
E. Jackson	1,500		

MORTLAKE.—For the erection of two shops, and alterations to other buildings. Mr. Ernest Pennington, surveyor, Richmond:—

W. N. Street	£1,525	E. Seaber	£1,450
Hughes & Co.	1,480	J. W. Brooking‡	1,429

‡ Accepted subject to modifications.

[*See also next page.*

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ROEHAMPTON.—For the erection of stabling, "Downshire Lodge," for Mr. Hugh C. Smith. Mr. Ernest Pennington, surveyor, Richmond :—

Adkins & Sons	£385 0	Seal & Co.	£340 10
Adamson & Sons	350 0	E. Seaber*	300 0

ST. MARGARET'S.—For general repairs to thirty-one houses, Orchard-road. Mr. Ernest Pennington, surveyor, Richmond :—

H. Snell* £182 10

LONDON SCHOOL BOARD TENDERS.

At the last meeting of the London School Board, the Works Committee submitted the following lists of tenders. Mr. T. J. Bailey is the Board's Architect :—

* *Recommended for acceptance.*

The work at the schools will have to be done during the summer holidays—July 25 to August 23, 1902. Where exterior as well as interior work has to be done, an additional week will be allowed for the former :—

ALMA.—Pupil teachers' school :—

Sayer & Son	£161	Belcher & Co.	£127
Johnson & Co.	139	J. Harries*	90
H. J. Williams	135		

BARRETT-STREET.—Painting interior :—

M. Pearson	£255 0	Bristow & Eatwell	£223 10
Chinchen & Co.	249 0	Marchant & Hirst.	219 0
W. Chappell	235 0	T. Cruwys*	185 0

BROMLEY HALL-ROAD. — Painting interior of main school, and cleaning interior of J. M. school and I. B. :—

G. Wales	£639 10	Vigor & Co.	£514 10
Gibb & Co.	581 0	T. H. Jackson	510 0
J. F. Holliday	570 0	A. W. Derby	453 0
Corfield & Co.	555 0	A. J. Sheffield*	449 0

CALEDONIAN-ROAD.—Painting interior :—

J. R. Sims	£450 0	T. Cruwys	£376 0
C. & W. Hemmings	396 5	G. Kirby	364 0
Dearing & Sons	390 0	Stevens Bros.*	348 0

CORMONT-ROAD. — Painting interior and exterior :—

Lathey Bros.	£461 0	Rice & Son	£369 0
W. Y. Goad	397 0	Maxwell Bros., Ltd.	328 16
Holliday & Greenwood, Ltd.	394 0	E. Triggs*	327 0

CRAMPTON-STREET. — Painting interior (Main School and I.B.s) :—

J. Appleby	£768 0	Maxwell Bros., Ltd.	£639 0
Martin, Wells, & Co.	750 0	Sayer & Sons	562 15
W. Y. Goad	694 0	G. Kemp	546 0
		Rice & Son*	515 0

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W. Banks	195	W. J. Howie*	128
Hayter & Sons	155		

ELEANOR-ROAD.—Painting interior and exterior :—

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Collis, Willmott, & Son	407 0	G. Barker	435 0
Stevens Bros.	496 0	Marchant & Hirst	429 0
Silk & Son	492 10	Chessum & Sons	385 11
		W. Hornett*	355 16

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D. Gibb & Co.	299	Corfield & Co.	285
Vigor & Co.	294	A. W. Derby*	260

LYNDHURST GROVE.—Painting exterior :—

H. Line	£222	Johnson & Co.	£205
Black & Son	211	W. Y. Goad	196
J. F. Ford	206	W. Hooper*	180

MANSFORD-STREET. — Cleaning interior (S. M. and special), painting exterior (J. M.) :—

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Collis, Willmott, & Sons	569 15	G. Barker	539 0
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W. Chappell	398 10		

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Open Spaces, Footpaths, and Rights of Way.

MANY books on legal subjects scarcely derive weight from their authors, but Sir Robert Hunter's work on Open Spaces, Footpaths, and Rights of Way,* is unquestionably more authoritative in consequence of the knowledge and experience of the writer in regard to common lands and rights of way, for Sir Robert Hunter has been personally and professionally engaged for many years past in the modern development of the law in regard to open spaces. The second edition of this work accentuates more than ever the remarkable historical development of the subject, for from a mere private use of common lands, arising from rural and agricultural necessities dating from a period anterior to the Norman Conquest, there has developed what may be considered a principle, that of the enjoyment of commons by the general public, not in respect of any private ownership of property, but because modern social development and the increase of towns has necessitated the use of open spaces for the people. It would be to go too far back to recur now to the period of strife and conquest about the year 1870, which resulted in the triumph of the principle that the commons were to be used for popular enjoyment; a use, as we have said, springing out of a mediæval personal use by those who are legally called commoners. That period of contest was followed by one of legislation which is now continuing, and which is likely to go on for many years. There was, for example, the Metropolitan Commons Act of 1866, and the Commons Act of 1876, which applied to commons other than those in or near London; and there has now followed, as the last and most recent of these statutes, the Commons Act of 1899, which for the first time enabled a common to be regulated by a scheme (confirmed by the Board of Agriculture) without recourse to Parliament. By making the District Council the managing body, the Act also indicates what may perhaps be reasonably hoped for as the final outcome of the long struggle for common lands, namely their protection, in ordinary cases, by the Local Authority. A chapter upon this Act, which, it is hardly necessary to mention, applies only to rural commons or rather commons not affected by the Metropolitan Commons Act of 1866, is probably that which is deserving of most attention in the new edition of Sir Robert Hunter's book. "Its object," he says, "is to enable a common to be placed under local management without interference with the rights of the owner of the soil or of the commoners. In some respects, as we shall see, its procedure is more prompt and direct than that of the Metropolitan Commons Acts, and it places the initiative in the hands of the Local Authority. On the other hand, it gives a veto on regulation to the Lord of the Manor or other owner of the soil of the common, and to persons representing one-third in value of such interests in the common as are appointed by the scheme—a veto which does not exist in the case of metropolitan commons."

The statutory provisions contained in this Act are as follows:—

"1. That free access is to be secured to any particular points of view.

2. That particular trees or objects of historical interest are to be preserved.

3. That there is to be reserved, where a recreation-ground is not set out, a privilege of playing games and of enjoying other species of recreation at such time and in such manner and on such parts of the common as may be thought suitable, care being taken to cause the least possible injury to persons interested in the common.

4. That carriage roads, bridle-paths, and footpaths on the common are to be set out in such directions as may appear most commodious.

5. That any other specified thing is to be done which may be thought equitable and expedient, regard being had to the benefit of the neighbourhood."

The scheme commences by declaring that the common in question, as delineated on a plan, shall be regulated and managed by the District Council (ch. 1). After a formal clause relating to the employment of the officers and servants of the Council in relation to the common (ch. 2), the scheme provides for the execution of works for the protection and improvement of the common, "so far only as may be required for the purposes of the Commons Act, 1899," and authorises the Council:—

"To repair footpaths;

To preserve the turf, shrubs, trees, plants, and grass, and for that purpose for short periods to inclose by fences such portions as may require rest to revive the same;

To plant trees and shrubs for shelter and ornament;

To place seats on the common;

To light the common;

And otherwise to make it more pleasant as a place of exercise and recreation."

It will be observed from these extracts that the management of a common regulated by a scheme under the Act of 1899 is vested in a District Council. That body may, however, delegate the management of a common to a Parish Council, or possibly to a joint committee of two councils where a common is within two separate parishes. In many respects a Parish Council, being a more purely local body than a District Council, is the best fitted to manage a common, since it lies under its immediate and constant supervision. But whether managed by a District or a Parish Council, there can be no doubt that there is scarcely a common within the home counties which would not be better placed under a scheme, for it should be borne in mind that to regulate a common

* "The Preservation of Open Spaces and of Footpaths and Other Rights of Way." By Sir Robert Hunter, M.A., J.P., Solicitor to the Post Office. Second Edition. London: Eyre & Spottiswoode. 1902.

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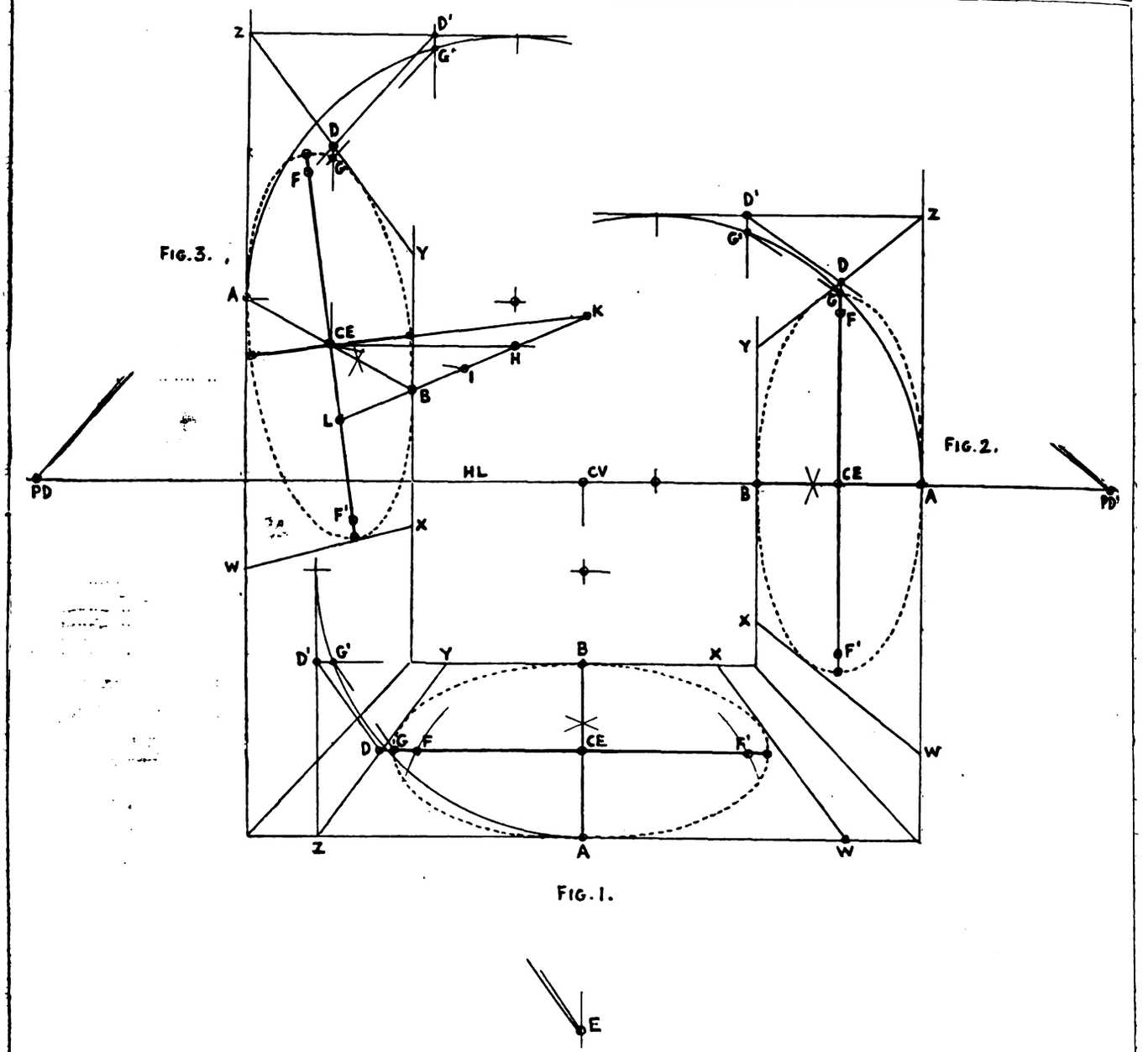

does not mean to take away its open air and rural character. To place seats on it, to prevent encroachments, to keep the pathway passable, and to plant trees, tends to make a common more beneficial to the public. In the Middle Ages a forest did not necessarily imply merely a woodland district, and the popular idea that a common is an open space without trees is equally erroneous, for some commons are treeless simply because there has been no proper body to protect trees and underwood. Sooner or later every common must be placed under a public body; this is a natural and necessary sequel to the carrying out in practice of the now admitted principle that the English commons are for the benefit of the public in general. A common is really in a kind of transitional state at the present time, which is not thus regulated; it is passing out of the pcsition of a stretch of land, the soil of which belongs to a private owner, and the beneficial use of which is enjoyed by a few persons, into the state of public land.

It is impossible in a reasonable space to do more than note some few points which suggest themselves on an inspection of this new edition of Sir Robert Hunter's interesting and valuable book. There is one matter, however, that is so important at the present day that it must not be lost sight of —namely, the right of way along sea cliffs. There is not, as a matter of course, any right of way along the edge of a cliff, and every one will recall instances in which private inclosures cut off all access to the cliff edge. There is, however, very commonly a walk used by the coastguard; and where this is clearly defined, leads from point to point, and is freely used by the public, it may be assumed that such walk is a public footpath. The erection of stiles and gates across the path, where it passes through walls or hedges, is strong evidence of public right.

Such being the state of the law, it is obviously of the greatest importance that local bodies who have authority near the coast should safe-guard very carefully the right of way along sea cliffs, otherwise rights of the greatest importance to the public may be permanently lost. And it is important to bear in mind that when a portion of a cliff falls away by the action of the sea, and the pathway disappears, the right of way also lapses, unless it is possible to form a permanent and passable road over the debris along the same line of the old track. So that where the public right of way is lost by the action of the sea an arrangement should be made, if possible, with the landowner to grant a fresh right of way along a new coast line between the broken points.

THE CIRCLE IN PERSPECTIVE.

By H. WALTER LONSDALE.

IN the notice of "Some Books on Perspective," published in your issue of April 19, reference was made to the irksomeness and imperfect accuracy of the method of tracing the curve of the ellipse representing a circle in perspective by the usual process of finding a number of points and then through these drawing the curve by hand. Though several methods are known by which the ellipse can be drawn with geometrical exactitude, no mention of them, so far as I have been able to ascertain, is made in any treatise on perspective published in England. The diagrams which I enclose, adapted from the processes given by Professor Chomé, of the Ecole Militaire de Belgique, in his "Cours de Géométrie Descriptive,' and by Professor Ware, of Columbia University, New York, in his valuable "Modern Perspective," will, therefore, I venture to think, be of interest to students, and of practical value to draughtsmen in tracing elliptical curves, especially those of large size. The object of the construction is in each case to determine the foci of the ellipse; these once found, the curve can be traced mechanically by the well-known means of two pins and a piece of thread.

In fig. 1, W X Y Z is the perspective of

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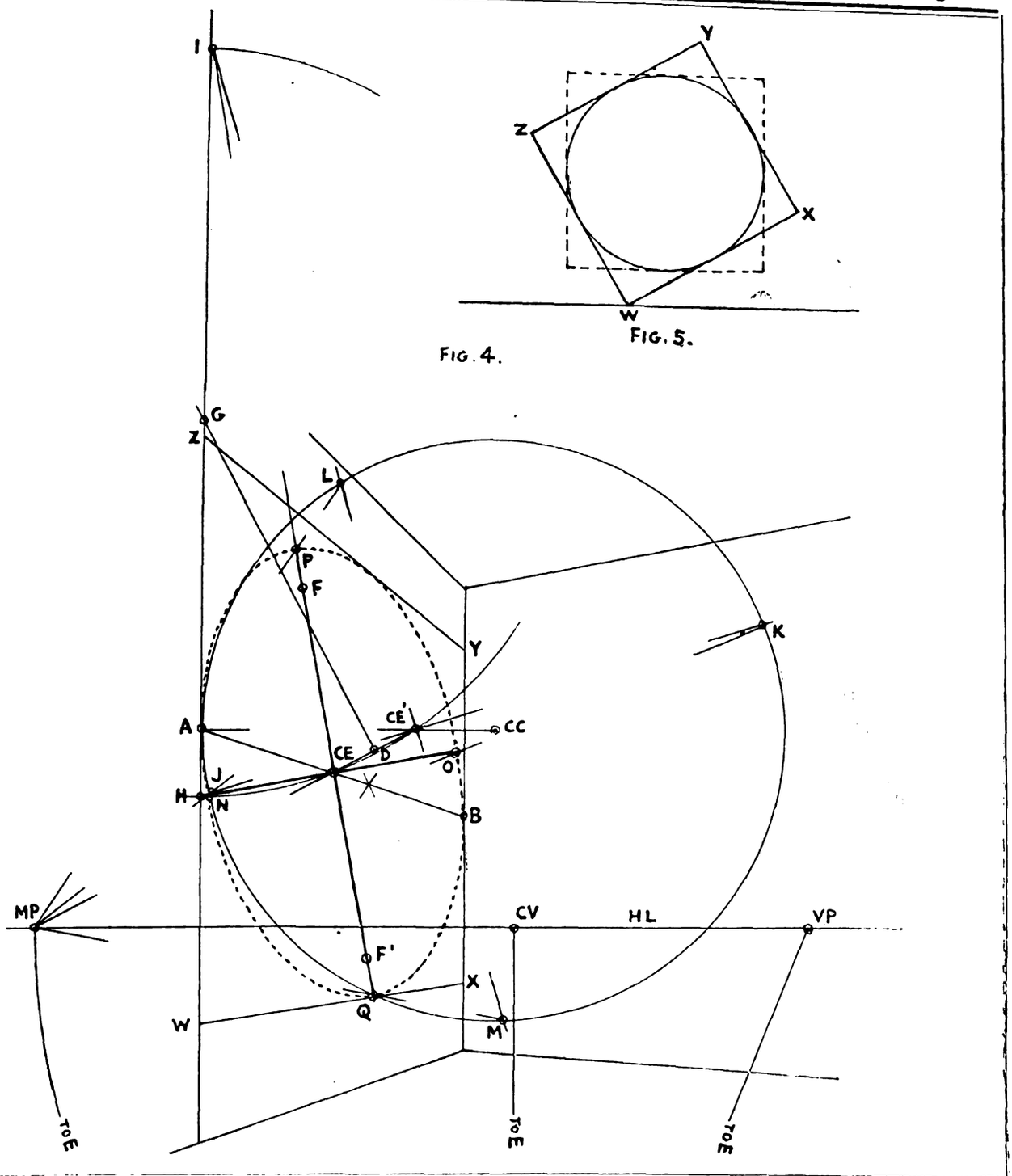
FIG. 5.

FIG. 4.



the square in which the ellipse is to be inscribed. It lies in a horizontal plane, and has two of its sides parallel to the picture-plane, and two, therefore, at right angles to it, its centre being on a line directly opposite the spectator.

On A Z erect a portion of the vertical elevation of the circle A G¹ and of its circumscribed square A Z D¹.

Through the centre of the perspective square draw A B perpendicular to W Z. A B is a diameter of the ellipse and its minor axis. Bisect A B in CE, the centre of the ellipse. Through CE draw a parallel to W Z, cutting Z Y in D. CE D is the direction of the major axis, of which the length has to be found.

On a perpendicular to the horizon HL, drawn from the centre of vision CV, make CV E equal to the distance of the eye from the picture. CV E being the vanishing line of vertical planes at right angles to the picture, E is the vanishing point of lines in such planes at 45 deg. to the horizontal plane, and, therefore, the point from which any point on the vertical elevation may be projected to its corresponding point on the horizontal plane and vice versâ.

Project D to D¹ on the elevation; from D¹ draw a parallel to D CE, cutting the circle in G¹. D¹ G¹ is a portion of the line D CE projected to the elevation. Find the point on D CE corresponding to G¹ by a line from G¹ to E cutting D CE in G. G is a point of the ellipse and one end of the major axis.

From either end of the minor axis, say A, as centre, with radius=CE, G, draw an arc cutting the major axis in the foci F, F¹.

Insert a pin at each of the foci. Make a small loop at the end of a piece of thread; pass the loop over one of the pins and wind the thread round the other, keeping it stretched by the point of the pencil placed at any point of the curve, say B. The movement of the pencil kept pressed against the thread will describe the ellipse

The process for an ellipse in a vertical plane perpendicular to the picture and having its centre on the horizon, is precisely similar (fig. 2). The point of projection, corresponding to E in *fig.* 1, is now PD, the distance of the eye from the picture set off on HL from CV.

Fig. 3 shows the construction required when the centre of the ellipse is not on a line opposite the eye. Draw A B, the perspective of a horizontal line passing through the centre of the square W X Y Z. Bisect A B to find CE, and draw the vertical CE D.

Erect on A Z a portion of the elevational square and circle, and, by means of PD, find point G as before.

Now A B is not the minor axis, nor is CE G the semi-major axis; they are diameters of the ellipse. The tangent A Z at the extremity of A B being parallel to CE G CE A and CE G are conjugate semi-diameters, by means of which the axis and foci can be determined

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Several methods for doing this are to be found in treatises on conic sections; the one here adopted is the simplest, and is based on the relations between the ordinates of the ellipse and of its circumscribed circle. From CE draw CE H perpendicular and equal to CE G. Join H B and bisect it in I. Make I K and I L, on H B produced, equal to the distance I CE. L CE is the direction of the major, K CE that of the minor axis. K B is the half-length of the major, K H that of the minor axis.

Find the foci and complete the ellipse as before.

Fig. 4 is an adaptation (for the sake of uniformity with the foregoing constructions) of the interesting method of Professor Ware. W X Y Z is the perspective of a square lying in a plane not at right angles to the picture, and having its centre (as in fig. 3) above the horizon. Draw A B and on it find CE as before. From A draw A CC parallel to HL, making it = A W. CC is the centre of the elevational circle, which draw with radius CC A.

The point of projection in this case, where the plane of the ellipse is not perpendicular to the picture, is not PD, as in figs. 2 and 3, but the measuring point, MP. This is found by setting off on the horizon, from the vanishing point of horizontal lines in the vertical plane, the distance between this vanishing point and the eye, that is, making VP MP = VP E.

By means of MP, project CE to its corresponding point CE^1 on the elevation. Join CE CE^1, and bisect it in D, whence draw a line perpendicular to CE CE^1, cutting W Z in G. From G as centre, with radius G CE (or G CE^1), draw an arc, cutting W Z in H and I. H CE is the direction of the minor, I CE that of the major axis.

From H and I draw through CE^1 to cut the circle respectively in J and K, L and M. Lines from J and K to MP will give the length N O of the minor axis, from L and M the length P Q of the major axis. From these find the foci as before.

As the axes of the ellipse form right angles at CE (being the only conjugate diameters that do so), and their projections on the elevation also right angles at CE^1, the object of the construction is to find, on a line common to the two curves, the diameter of a semicircle that will pass through CE and CE^1. Lines drawn from these two points to the extremities of the diameter would therefore respectively contain right angles, one of which would be the projection of the other. W Z is such a line, being the tangent common to the circle and the ellipse. CE CE^1 being a chord of the required semicircle, a perpendicular from its centre cuts the tangent in a point G which is the centre of the semi-circle. The points J K L M of the elevational circle, projected back to corresponding points of the ellipse, give the lengths of the axes.

When the sides of the square containing the circle to be put into perspective lie in obliquely to the picture, as in W X Y Z of fig. 5, the simpler method in practice is to revolve the square on plan, so that its opposite sides are respectively parallel and perpendicular to the picture, as shown by the dotted lines, and to put this into perspective by the process already described. The direct method of obtaining the ellipse is more complex.

When ellipses lie in inclined or oblique planes, the procedure does not vary; the point of projection, E, PD, or MP, as the case may be, is then represented by the corresponding point proper to the position of the plane in use.

The perspective of an ellipse being also an ellipse, the process is the same as for a circle, the only difference being that the elevational ellipse is contained by a rectangle instead of by a square.

TEMPORARY TIMBER STRUCTURES.

By W. H. THORPE, A.M.Inst.C.E.

THE large use just now being made of timber in temporary structures, about London more particularly, renders it opportune to consider the principles to be observed in design or in survey. The same methods being applicable to permanent structures will render the matter of more general interest.

A characteristic feature in connexion with which there may be occasioned doubt, is the sloping beam and its immediate supports. First let us deal with such a beam having rigid supports and vertical reactions. The bending moment at any point will be as for a beam of span equal to the horizontal distance between the supports, with the loads projected vertically upon it; the stresses will be as for the actual section of the beam, corresponding to those moments. But a sloping beam has not of necessity rigid supports and vertical reactions; though it is to be observed that, whether this is so or not, the bending moments and stresses due to them remain unaltered, with, however, an additional force acting through the length of the beam; these end-on forces will for ordinary cases be unimportant, and are not further regarded as affecting the strength of the sloping beam itself, which thus remains a simple matter readily determinable. But the question of the effect on the supports of reactions vertical or otherwise, is less simple, and for the purpose of considering the principal cases it will be desirable to enumerate them, though it is not pretended that the list is complete, as the varieties which may be produced by the ingenious carpenter are probably past numbering.

1. Bearings having the slope of the beam.
2. Bearings of which the upper has a vertical butt only.
3. Bearings horizontal and rigid.
4. Bearings horizontal, of which one is on a flexible beam.
5. Bearings horizontal, of which both are on flexible beams.

1. *Bearings having the slope of the beam*—Here it is obvious the tendency is for the beam to slide upon its supports. This tendency may be arrested by friction only, in which case the angle of slope must be moderate, say, not exceeding 15 deg.; but an effect of this resistance to sliding, by friction or by other special means, brings this case into one or other of those remaining, so far as the character of the reactions is concerned, and will be dealt with later.

2. *Bearings of which the upper has a vertical butt only.*—In this there is no bearing properly so-called at the upper end; the tendency to slide down must therefore be resisted by the butting of the lower end, as otherwise there would be nothing but frictional resistance to prevent collapse; it is a case seldom seen, though not without examples.

For angles commonly adopted, say between 20 deg. and 40 deg., the horizontal thrust is very considerable relative to the load supported, and will be equal to the moments of the vertical loads round the lower support, divided by the vertical distance between the supports. At flat angles the thrust along the beam itself may become of importance; the capacity of any member receiving the thrust of either end has also to be considered.

3. *Bearings horizontal and rigid.*—This practically is the case which has already been considered in the opening paragraphs.

4. *Bearings horizontal, of which one is on a flexible beam.*—Suppose the lower end of a sloping beam to butt upon a rigid support, the upper end being carried by a horizontal beam at right angles to it. The vertical deflection of the supporting beam must be accompanied by a horizontal displacement, since the lower end being on a fixed support and incapable of vertical or horizontal movement, the slight change of angle due to lowering of the upper end involves a horizontal movement of that end; a consequence of this is that the stresses in the supporting beam are not those due to vertical loading simply, but are as for a force applied out of the vertical, and corresponding to the reaction of the sloping beam. It is assumed, as will be apparent, that the upper end of the sloping beam cannot slide upon that supporting it, being restrained either by friction, or as would commonly be the case, by the method of construction; the ends of the supporting beam are also considered as not free to move. The diagram, fig. 1, will illustrate the matter.

The amount of the horizontal resistance offered by the supporting beam will be dependent upon the relation of breadth to depth. The less the breadth relative to the depth, the smaller will be this resistance; but it is proposed to take first the simpler case of a square supporting beam, in which equal movements horizontally and vertically would be accompanied by equal developments of stress.

It is apparent, on consulting fig. 1, that for small movements such as we are dealing with, the horizontal displacement of A is to the vertical displacement as the base of the triangle A B C is to the perpendicular, and the resistance offered by the square supporting beam will be horizontally and vertically in the same ratio, the resultant opposition being in the direction B A, *i.e.*, normal to the sloping beam. The value of this reaction will be that due to moments of the vertical loads round the fixed support, divided by the sloping span, or if R = the vertical reaction as for a beam on level bearings of span equal to the horizontal distance between supports, the inclined reaction R_1 for the end we are dealing with will be:—

$$R \times \cos \theta.$$

It is convenient in determining the effect on the supporting beam to estimate the stresses as for the two components (horizontal and vertical) of this force and compound the results, in preference to dealing with the single force, as this would necessitate ascertaining the modulus of strength for the section of the supporting beam for positions of the neutral axis varying with the angle of inclination; whereas by dealing with the component forces we need only to know the values of the modulus with the neutral axis parallel to either side.

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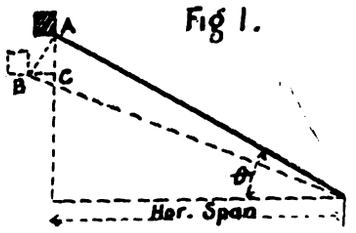
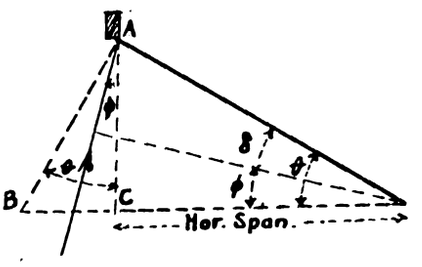


Fig 1.



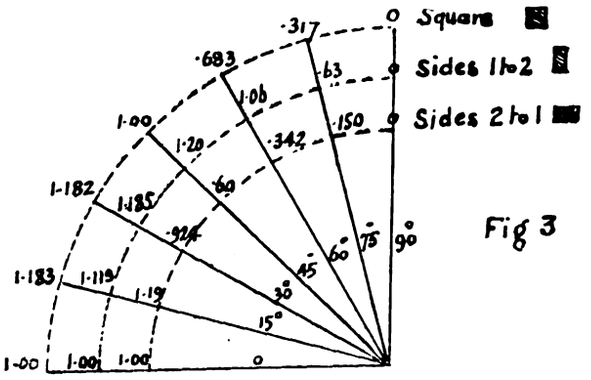


Fig 3

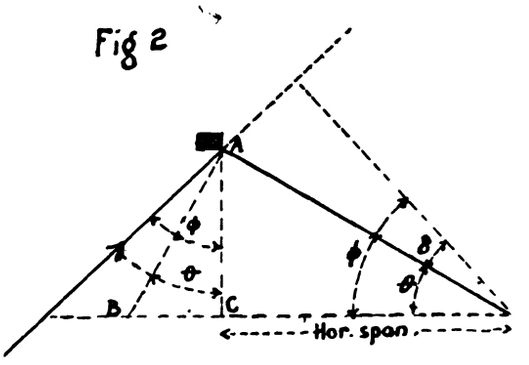


Fig 2

The vertical component of the inclined reaction R_1 will be :—

$$R_1 \cos\theta \quad \text{or} \quad R\cos^2\theta$$

and the horizontal component—

$$R_1 \sin\theta \quad \text{or} \quad R(\cos\theta \times \sin\theta).$$

With these forces determined, extreme fibre stresses in the beam may be estimated and compounded. Or, more simply, the extreme fibre stress may be taken as equal to that induced by a vertical load equivalent to—

$$R\{\cos^2\theta + (\cos\theta \times \sin\theta)\}.$$

The lower end of the sloping beam which is not free to move has the same horizontal reaction as the upper end, but a vertical reaction equal to the difference between that already found ($R\cos.^2\theta$) for the upper end and the total load. The resultant reaction (inclined) may be serious in amount, and need special consideration, according to the character of the bearing.

If the condition as to the bearings be now reversed, the upper support being rigid and the lower upon a flexible beam, the reactions are in amount the same as before for the fixed and movable ends. But whereas in the case already dealt with in detail the reactions incline towards a point above the beam (over the centre of gravity of the loads), in the case under consideration the reactions incline away from a similar point below the beam (under the centre of gravity).

With a supporting beam having sides unequal, the horizontal and vertical displacements are, as before, simply dependent upon the slope of the beam, but the resistance offered by the unequal-sided beam (of horizontal dimension b, and vertical dimension d), will be horizontally and vertically as $\frac{b^2}{d^2} \times$ BC is to AC, and the angle the inclined reaction makes to the vertical, will be that which has the $\tan = \frac{b^2}{d^2}\tan\theta$, which call angle ϕ; and the difference between these two angles, θ and ϕ, call angle δ. The value of this inclined reaction will be that due to moments of the vertical loads round the fixed support divided by the perpendicular distance between this support and the line of the reaction ; which distance will be to the horizontal span as :—

$$\sec\theta \times \cos\delta \text{ is to } 1.$$

and the inclined reaction will be, using R with the same significance as before :—

$$R \times \frac{1}{\sec\theta \times \cos\delta}$$

The vertical component will be :—

$$R \times \frac{\cos\phi}{\sec\theta \times \cos\delta}$$

and the horizontal component :—

$$R \times \frac{\sin\phi}{\sec\theta \times \cos\delta}$$

As before, the extreme fibre stress induced may be taken as equal to that produced by a vertical load, equal to :—

$$R\left(\frac{\cos\phi}{\sec\theta \times \cos\delta} \div \frac{\sin\phi \times d}{\sec\theta \times \cos\delta \times b}\right)$$

In the diagram fig. 3 are shown results for three sections of beams at different angles, from which it will be seen that the quantities by which the vertical reaction R (as for a horizontal beam) should be multiplied to give a vertical load capable of producing the same extreme fibre stress in the supporting beam, as with the actual inclined reaction, are not more than 20 per cent. greater than unity, and may be much less. This moderate excess may very properly be covered in timber work by a suitable factor of safety, but it would not be prudent to rely too confidently upon the smaller values in considering the strength of the supporting beam, unless the fixed support could be relied upon to justify its name. If this support *is* rigid in its nature, its capacity to provide the reaction as a question of strength or stability is important, as the amount may in quite practicable cases be easily three times as great as for a simple vertical reaction only.

It is hardly necessary to point out that in preference to using all the formulæ given it is much simpler, after ascertaining the direction of one inclined reaction, defined by angle ϕ, to determine its amount, and the remaining forces graphically.

5. *Bearings of which both are on flexible beams.*—If both supporting beams are of such strength as to deflect equally under load there will be no alteration in the angle of inclination of the sloping beam, no spreading of the bearings, and as a consequence no horizontal reactions.

If the supporting beams do not deflect equally, due either to difference of spans, of sections, or to irregular loading of the sloping beam ; there will be effects similar in kind to those already dealt with.

With respect to the uprights of timber structures, the tendency generally is to make these of ample size for solid timber, but as it is common to use joist cantlings bolted together to make posts, it is well to observe that the ultimate resistance of these, if long (say 20 dias.), is probably little greater than one-half that of the solid post if with no joints ; if with occasional joints not specially fished, then little better than one-fourth of the solid post, if of three thicknesses only ; or perhaps one-third for four thicknesses, having regard to the fact that bolts are not as a rule very freely used. It is important, therefore, with such posts to be particularly careful in the matter of staying and bracing.

With regard to bracing generally, it is suggested that this may be somewhat deceptive in appearance. If well bolted at the ends, or properly butted, and in that case expected only to act as strut members, there will, in the majority of cases, be no occasion for uneasiness ; it is, however, possible to use a good deal of timber in bracings which in reality are very inefficient for want of these precautions ; and liable, under forces which should bring them into use, to slip and slide at their ends, offering but little real resistance to distortion of the structure. Where bracings with butted ends are used, the structure may (particularly if high) prudently be watched as the full load comes upon it, accompanied by a not improbable settlement, in order that any slacking of the butted ends may be made good with hard wood wedges. It is hardly necessary to note such an obvious precaution as taking care to ensure a liberal strength in all places where beams or posts are notched or otherwise weakened.

MAIN DRAINAGE WORKS, SUNDERLAND.—The Sunderland Rural District Council have instructed Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and Birmingham, to prepare a scheme of main drainage for the parishes of Ford and Bishopwearmouth.

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NOTES.

The Fatal Fire in Queen Victoria-street.

THE terrible loss of life at the General Electric Co.'s offices on Monday last tends to show that there must be something radically wrong in the administration of our preventive regulations, as well as in the management of our fire-brigade. We do not know if the upper floors of the General Electric Co.'s offices would rank as premises under the Factory Act; but whether they are classed as such or not, it would seem obvious that the Building Act should compel owners who change the purpose of their buildings from an ordinary office or an ordinary warehouse into that of a factory employing many hands, to provide greater facilities for exit. It is terrible to imagine what this identical fire would have been had it taken place on a winter's day in the dark instead of on a bright afternoon. Turning to the fire-brigade aspect of this catastrophe, we find that, although the Building Act requirements as to height were based to a considerable extent on Sir Eyre Shaw's wish that every floor should be accessible with an 80-ft. fire-escape, the fire-escape at Watling-street, standing in the midst of high property, seems to have been only about 60 ft., if as much as that, with the result that it did not reach as far as the windows of the floor on which the work of the factory was being done. In this age of committees and of divided responsibility it is difficult to allocate the responsibility to any given individual, but the common-sense view is that the chief officer of a fire-brigade who allows a small fire-escape to be placed at Watling-street in the centre of high property must either be misinformed of the requirements of the district he has to protect, or have quite misunderstood the grave position in which he stands in the case of loss of life due to negligence. It is incomprehensible that in a city like ours there should be loss of life in a building situated a few hundred yards from a fire-station, no matter what defects there may have been in the construction or arrangement of exits; for it is surely one of the main objects in equipping a fire-brigade with escapes to provide for cases of this kind where the natural exits are defective.

Sir Benjamin Baker's Lecture.

THE Friday evening lecture given last week by Sir Benjamin Baker at the Royal Institution, on "The Nile Dams and Reservoir," was attended by an unusually crowded audience, not we fear so much from an enlightened interest in the subject as from the fact that the Prince and Princess of Wales were to be present. The lecture was of an entirely popular character—Sir Benjamin Baker, with all his engineering science, is a master in the art of putting things in an interesting way for a general audience—and consisted to a large extent in brief explanations of the numerous fine photographs of the work in different stages which were passed rapidly in review before the audience. The first diagram was a comparative map of England and Scotland and lower Egypt, to enable the audience to realise the distances dealt with in Egypt by comparison with those with which they were familiar. The illustration and description of the old barrage at the apex of the Delta were of considerable interest; and the experience of the behaviour of this erection in time of flood was of considerable value in showing what to provide against in the new structures. The great new barrage at Asyût (or Assiout) 250 miles above Cairo, commenced in 1898 and now nearly completed, is on the same general principle as the old Delta structure, only in stone instead of in brick, and is protected by a continuous line of cast-iron grooved and tongued sheet piling, extending 23 ft. below the floor of the masonry, so as to prevent scouring out of the foundations. The illustrations gave a vivid idea of the extraordinary scale of the work; but we prefer to leave further details till we can have an opportunity of adequately describing and illustrating it in a manner more suitable to the requirements of our readers than a report of a popular lecture could be. That we heard the lecture at all was due to the courtesy of Sir B. Baker, and in no sense to that of the Royal Institution, which graciously informed us at the last moment that in consequence of the extra demand for seats, all the usual Press entries were stopped—thus depriving us, as far as they were concerned, of admission to the only Friday evening of the session which was of special interest to architects, in order to find seats for people who merely wanted to stare at Royal visitors—such is the "loyalty" of the Royal Institution in these matters.

Embankment Tramway.

THE Tramway Bill of the London County Council passed its third reading last week. This is the Bill which contains a clause to allow a tramway from Waterloo to Westminster Bridge, which will form a link with the tramways north and south of the Thames. It is a matter of surprise that after the question had been debated on the second reading, and had been investigated by a Committee of the House of Commons, another attempt should have been made last week to defeat the scheme. However, the Bill is now safely through the House of Commons, and we can scarcely suppose it will be opposed in the House of Lords, though all things are possible. Nothing is more surprising than this class opposition to a scheme which will be an immense public benefit. It is a class opposition which has really no ground, since carriage people use the Embankment very little, and there will be plenty of space both for carriages and tramways.

Hampstead Heath.

WE are informed that at a meeting of the Committee of the Hampstead Heath Protection Society held at Hampstead on May 13 it was decided to continue the opposition to any tunnelling under the Heath, "on the ground that, notwithstanding any provisions to the contrary which may be inserted in the Bill, the construction of an underground railway under the Heath must necessarily lead sooner or later to communications with the surface, either for a station or for purposes of ventilation, which must inevitably injure the Heath; and even apart from these considerations, on account of the possible danger to the springs of water, and to the vegetation of the Heath." We entirely concur in the views here expressed. Part of the great attraction of the Heath consists in its character of rural quietness and remoteness from noise and traffic. A railway under it, with the inevitable stations on the surface, would at once destroy this character.

The L.C.C. and the Price of Gas.

WITH a view to obtaining a substantial reduction in the price charged for gas north of the Thames by the Gas Light and Coke Co., the London County Council decided last Tuesday to promote legislation in the session of 1903 for (1) reducing the standard price from 3s. 9d. to 3s. 3d. per 1,000 cubic feet; (2) placing the Company under obligation to provide annually a certain sum out of the amount available as dividends for the purpose of extinguishing its obsolete capital; and (3) reducing the standard illuminating power from 16 to 14 candles, there being an equivalent reduction in the standard price. The City Corporation has agreed to co-operate with the Council. The third proposition will come as a surprise to many, but we are entirely in accord with the Council in regarding the suggested change as one which will be of material advantage to the majority of gas consumers. The Council also intend to ask for a change in that portion of the South Metropolitan Gas Act of 1900 which relates to the illuminating power test. This will afford an opportunity to the gas engineers to remove an injustice which has in recent years been committed in recording the illuminating value of gas. Hitherto the illuminating value of gas has been quoted as 3·2 candles per cubic foot of gas consumed per hour. Under the new regulations it will be only 2·8 candles per cubic foot. Now even with the so-called 14-candle gas it is easily possible to obtain an illuminating power of 20 candles per cubic foot of gas consumed per hour by using an ordinary incandescent burner. Electricians have naturally taken the 3·2 candles as the standard value for gas, and were able to justify their action by reference to the standard fixed by Acts of Parliament. But the Gas Act relating to the selection of the power used for testing very properly stipulates that the burner "shall be such as shall be the most suitable for obtaining from the gas the greatest amount of light, and shall be practicable for use by the consumer." The burner at present used does not give one-sixth of the amount of light now commonly obtained by consumers from the gas supplied.

Australian Timber Trade.

THOSE who have watched the gradual depletion of many important Australian forests will not be surprised to learn that forest conservation is likely to receive more attention from Australians in the future than in the past. Outside Western Australia the importance of forestry has not been generally recognised, and the "Year Book of Australia" remarks that even in that State the necessity for care in depleting the sources of jarrah and karri timber supply has too frequently been overlooked. At the present time the Commonwealth imports of timber largely exceed in value the exports, despite the valuable shipments, representing a total of 458,864*l.* during 1900-1 from Western Australia; the bulk of the oversea imports represent soft woods not grown in any of the

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Australian States. The establishment of the New South Wales Timber Industries Association has been attended with good results. The object of the organisation is the introduction of an improved method of forest administration. In Queensland a Forestry branch has been established in connexion with the State Lands Department. The area of timber reserves in that State at the end of 1900 was 1,622,855 acres, and this area has been considerably augmented. A systematic investigation of the timber resources of Queensland is now being undertaken by the State Government. Forestry in South Australia has received a considerable check from the depredations of rabbits and grasshoppers. It is estimated that a loss of 58 per cent. of young trees in one of the leading forest reserves has been occasioned by grasshoppers alone. Considerable replanting has recently been effected in different parts of the State. Tasmania is a fine timber-growing country, but comparatively little has been done in the way of properly utilising its forest resources. About one-fourth of the entire land surface of the State is roughly estimated to be covered with timber forest, but only 55,300 acres have been reserved by the State for timber planting, and the industry may be said to be in its infancy there. The long-continued reckless waste of growing timber in Victoria has had its effects for some years past, but the Victorian Lands Department is doing its best to improve matters in several districts. In spite of the large exports of timber from Western Australia, the condition of the trade is not in as flourishing a state as might be desired. It is satisfactory, however, to note that the study of forestry is receiving considerable support now that the necessity for it has been fully recognised throughout the Commonwealth.

Contractors' Carts.

THE attention of contractors should be drawn to the very drastic clause inserted by the Lords' Committee in the Bill of the Piccadilly and City Railway, at the instance of the City Corporation, to prevent the use of carts which allow material to fall in the roadway. The clause gives the Commissioner of Police power to seize not only the cart, but the horses also, and on proof of the facts before a Court of Summary Jurisdiction confers powers for the sale of the cart and horses, and for the application of the proceeds to the Police Superannuation Fund. This robust remedy has a mediæval character quite in keeping with the older traditions of the City.

Electric Theory.

THE electrotonic theory of electricity on which Professor Fleming lectured at the Royal Institution explains very clearly the causes of many electric phenomena which are quite inexplicable by the older theories. Whether the theory is true or not, it has advanced our knowledge of the subject, and has guided several physicists to important practical results. The original phenomenon whose study led Professor J. J. Thomson to work out his theory of electrons was one which to most people would appear to be of very trifling importance. It had been observed that when an electroscope was charged with negative electricity then the gold leaves rapidly converged when a ray of light especially ultra violet light fell on it. On the Thomson theory streams of radiant matter consisting of negatively charged corpuscles are supposed to leave the gold leaves under the action of the light, and on this hypothesis it has been calculated that the mass of each of these corpuscles must not be greater than the five hundredth part of the hydrogen atom. Granting this, the explanation of many of the mysterious actions of Röntgen rays, Becquerel rays, &c., is easy. The chemical atom consists of a nucleus covered with negative "ions" or electrons in a state of unstable equilibrium; these ions can diffuse through the interstices between the molecules of matter, and it is their flow that constitutes a current of electricity. According to modern theory a current of electricity consists of a flow of material particles, a flow which is rapid in conductors owing to the arrangement of the molecules being such that the ions can flow easily between the interstices of the molecules. When conductors are heated the increased vibration of the molecules obstructs the flow of the ions and hence the resistance of conductors increases with the temperature. Professor Fleming also pointed out that at the absolute zero of temperature it would follow that the resistance of conductors would be zero, a result which he and Professor Dewar had shown several years ago had been indicated by their experiments at low temperatures. Auroræ are probably due to the streams of ions given off by the sun when spots appear on its surface. In cathode ray experiments streams of luminous rays spiral round the lines of magnetic force in rarefied air. Hence we would expect the auroral arch in the upper regions of the atmosphere to spiral round the magnetic pole.

Restoration in Venice.

VENICE has had but few public monuments added during the nineteenth century to those which form the crumbling evidence of her republican greatness. It is now proposed, however, to complete the old church of the Foundling Hospital which stands on the Riva degli Schiavoni, as it has stood since 1754, its front of time-stained brickwork and the stumps of four columns, the base of a design which was never carried out, affording a characteristic example of Venetian decay. Twenty thousand francs have recently been bequeathed by a certain Gaetano Florentini to provide a new front, and for this purpose a competition was held, in which there was only one design submitted! The author of this unique design, Signor Pio Agazzi, has adopted the style of the neighbouring church of S. Zaccaria, and consequently the original design of Giorgio Massari, commenced in 1754, of which the lower portion remains, will never be carried out. Considering the small amount of money available, and the pretentiousness of the modern design, the intention is merely to provide a plaster frontispiece for the old church.

Mr. Byam Shaw's Exhibition.

AT Messrs. Dowdeswell's gallery is a collection of small paintings by Mr. Byam Shaw, under the title "Sermons in Stones and Good in Everything"; paintings with a moral meaning, and each illustrating, though rather obscurely in some cases, a sentence from the book of Ecclesiastes. These are in fact all pictures with a moral, and rather give one the idea that they have been suggested by the work in the same field of Miss Fortescue-Brickdale. We must confess that in many of them the moral meaning seems more important than the artistic result; but there are some powerful things among them. No. 11, though we do not exactly read the moral conveyed, is a fine study of three figures; No. 16 also shows much power of expression in the head of the man; No. 24 is very effective as a piece of colour. The colouring in nearly all is very strong; sometimes rather harsh and crude. It is a collection which is interesting but, from the artistic point of view, unequal.

The Dutch Gallery, Brook-street.

AT Messrs. Wisselingh's gallery is a small collection of paintings some of which are sketches too crude to be of much interest; but there are some things of considerable beauty. Among these are various paintings by M. Fantin-Latour—a large still-life work of great beauty of colour and breadth of style, "Un Coin de Table," and some small and slight sketches of flowers and fruit which are perfect in colour. Among several landscapes by Mr. Mark Fisher is an exquisite little moonlight scene; Herr Israels' comparatively large picture "The Little Nurse," is an important work, but does not show the artist quite at his best. Mr. Furse's fine sketch for a spandrel painting for the decoration of the Liverpool Town Hall is another attraction of the collection, which is well worth a visit, though we cannot admire everything in it.

Stage Gothic at Westminster Abbey.

WE certainly have the most wonderful official faculty in this country of doing the wrong thing in matters of architectural taste and propriety. A large entrance hall or vestibule was needed in front of Westminster Abbey for the purposes of the Coronation ceremony; and instead of making it an artistic but obviously temporary pavilion in front of the Abbey and having no architectural connexion with it, a sham Gothic structure has been carried out, with battlements and traceried windows painted to resemble stone, to look as if the architecture of the Jerusalem Chamber had been carried on across the west front as a kind of narthex. This must be the Office of Works; it is a kind of proceeding which would be exactly in accordance with their usual perceptions of architectural fitness. And this is praised in the leading newspaper as an example of good taste! In these matters England seems perfectly hopeless.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE fifteenth general meeting (business) of the session 1901-1902 was held on Monday, June 9, 1902, Mr. Wm. Emerson, President, in the chair.

The decease was announced of Mr. Coutts Stone, Fellow, elected 1857. A vote of condolence with the relatives of the deceased was passed, and ordered to be entered on the minutes of the meeting. Mr. Alex. Graham, in making the announcement, stated that Mr. Stone was the father-in-law of their respected President, Mr. Wm. Emerson.

The minutes of the general meeting (ordinary), held on Monday, May 26, 1902, were confirmed.

The Report of the scrutineers appointed by the annual general meeting to direct the election of the Council, Standing Committees,

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&c., for the year of office 1902-3, was read, and the following declared duly elected :—

President.—Mr. Aston Webb, A.R.A., F.S.A.

Honorary Secretary.—Mr. Alexander Graham, F.S.A.

Vice-Presidents. — Messrs. John Belcher, A.R.A ; T. E. Collcutt ; A. Darbyshire, F.S.A. (President Manchester Society) ; John Slater.

Members of Council.—Messrs. F. T. Baggallay ; G. F. Bodley, R.A., F.S.A. ; J. J. Burnet, A.R.S.A. ; W. D. Caröe, F.S.A. ; W. M. Fawcett, F.S.A. ; Ernest George ; J. S. Gibson ; J. A. Gotch, F.S.A. ; G. E. Grayson ; E. A. Gruning ; E. T. Hall ; E. W. Mountford ; Professor Beresford Pite ; G. H. Fellowes Prynne ; W. H. Seth-Smith ; R. Phenè Spiers, F.S.A. ; Leonard Stokes ; Paul Waterhouse.

Associate Members of Council.—R. S. Balfour, H. V. Lanchester, W. J. N. Millard, E. W. Wimperis.

Representatives of Allied Societies.—Messrs. G. C. Ashlin, R.H.A. (Royal Institute of the Architects of Ireland) ; H. K. Bromhead (Glasgow Institute of Architects) ; F. Caws (Northern Architectural Association) ; C. H. Channon (York Architectural Society) ; E. W. M. Corbett (Cardiff, S. Wales, and Monmouthshire Society) ; A. Harrison (Birmingham Architectural Association) ; H. G. Luff (Devon and Exeter Architectural Society) ; A. Wakerley (Leicester and Leicestershire Society of Architects) ; Butler Wilson (Leeds and Yorkshire Architectural Society).

Representative of the Architectural Association (London).—Mr. H. T. Hare.

Auditors (1902-1903).—Messrs. Louis Ambler and H. S East.

STANDING COMMITTEES 1902-1903.

Art Standing Committee.—Fellows : Messrs. J. Macvicar Anderson ; J. J. Burnet, A.R.S.A. ; W. D. Caröe, F.S.A. ; T. E. Collcutt ; J. S. Gibson ; H. T. Hare ; E. W. Mountford ; A. N. Prentice ; G. H. Fellowes Prynne ; J. W. Simpson. Associates : Messrs. R. S. Balfour ; A. T. Bolton ; S. K. Greenslade ; J. J. Joass ; H. V. Lanchester ; E. W. Wimperis.

Literature Standing Committee.—Fellows : Messrs. John Bilson, F.S.A. ; A. W. S. Cross ; A. Graham, F.S.A. ; B. Ingelow ; W. A. Pite ; G. H. Fellowes Prynne ; R. Phenè Spiers, F.S.A. ; H. H. Statham ; C. H. Townsend ; Paul Waterhouse. Associates : Messrs. A. S. Flower, F.S.A. ; C. H. Reilly ; Professor R. Elsey Smith ; Leslie Waterhouse ; A. M. Watson ; Percy Scott Worthington.

Practice Standing Committee. — Fellows : Messrs. T. Batterbury ; S. F. Clarkson ; F. E. Eales ; E. Flint ; C. Harston ; G. Hubbard, F.S.A. ; J. D. Douglass ; W. Hilton Nash ; J. Osborne Smith ; E. Woodthorpe. Associates : Messrs. W. H. Atkin-Berry ; C. H. Brodie ; Max Clarke ; E. R. Hewitt ; H. H. Langston ; W. H. White.

Science Standing Committee. — Fellows : Messrs. T. Blashill ; F. R. Farrow ; J. S. Gibson ; F. Hooper ; W. E. Riley ; H. D. Searles-Wood ; A. Saxon Snell ; B. Tabberer ; E. Woodthorpe ; Keith D. Young. Associates : Messrs. S. B. Beale ; H. W. Burrows ; Max Clarke ; B. J. Dicksee ; E. R. Hewitt ; G. Pearson.

The following were elected as Fellows :— Herbert Phillips Fletcher [A. 1895], Assoc. M.Inst.C.E., F.S.I., of 29, New Bridge-street, E.C., and Anglebay, West Hampstead, N.W., proposed by Professor T. Roger Smith, E. B. l'Anson, and J. Douglas Mathews ; Cathcart William Methven, F.R.S.E., M.Inst.C.E., of Hampson's Buildings, Durban, Natal, nominated by the Council under Sections *c* and *d* of By-law 3 ; Frank Worthington Simon [Tite Prizeman 1887], of 16, Rutland-square, and 67, Great King-street, Edinburgh, proposed by John James Burnet, A.R.S.A., Huon A. Matear, and John Cotton.

Certain amendments and additions to the Institute Paper "Suggestions for the Conduct of Architectural Competitions," proposed by the Council, were discussed and agreed to as follows :—

The following paragraph to be inserted in Clause 1 :—

The selection of an assessor should be made with the greatest possible care, as the successful result of the competition will depend very largely upon his experience and ability.

Clause 4 to be amended so as to read as follows :—

4. The number, scale, and method of finishing of the required drawings should be distinctly set forth, and they should not be more in number, or to a larger scale, than necessary to clearly explain the design. If the assessor advises that perspective drawings are desirable it should be so stated ; and such drawings should be uniform in size, number, mode of colouring, or mounting.

The following to be added to Clause 12 :—

It is important that the award of the assessor should be adhered to, unless there is some valid objection to the employment of the author of the selected design to carry out the work, as to which the assessor is satisfied. The setting aside of the Assessor's award for any other reason constitutes a breach of faith on the part of the promoters.

The beginning of Clause 2 to read :—"The duty of assessors should be, *after conference with the promoters*" [the words in italics are new].

The Chairman announced that the annual dinner would take place on June 19, and that a number of very distinguished guests were expected. The next general meeting would be held on June 23, when the Royal Gold Medal would be presented to Mr. Thomas Edward Collcutt.

MAGAZINES AND REVIEWS.

THE *Art Journal* produces a "Coronation number," with a specially designed heraldic cover. The frontispiece is the fine etching of the interior of Westminster Abbey by Mr. Haig, which had already been sent to us as a separate work and was noticed in a recent issue of this journal. There is an article by Mr. Lionel Cust, "Surveyor of the King's Pictures and Works of Art," on "The King's Collection of Works of Art," many of them well known but here again illustrated ; one on "The King's Prints, Drawings, Miniatures and Gems," by Mr. Richard R. Holmes, the Librarian at Windsor Castle—among the illustrations is one of a magnificent cameo of the Emperor Claudius ; and one on "Unrecorded Armour and Arms in the European Armoury of Windsor Castle," by Mr. G. Francis Laking, Keeper of the King's Armoury, and which is very finely and fully illustrated. These articles, each written by the person in the best position to give accurate information, are of considerable value and interest. There are some illustrations also of former Coronation ceremonies, reproduced from old engravings. Portraits of the King and Queen of course find place in the number, which is a most successful one from this point of view.

The *Magazine of Art* opens with an illustrated article on the work of Mr. H. S. Tuke, "essentially a painter's painter," as the writer, Mr. Kains-Jackson, truly remarks. Mr. Tuke's pictures of his favourite subject of nude youths bathing are all admirable—one of the best is illustrated ; but we fear we cannot be persuaded to accept his "classical" nudes as worthy of their titles ; they are simply rather ordinary nude figures with a classical name. When gods and heroes are to be represented we want something more than that. The article on "A Spanish Sculptor," Señor Augustin Querol, introduces us to the work of an artist almost unknown in England. He is evidently a sculptor of great energy and vivacity of conception, but deficient in the sense of repose and beauty of line ; his sensational "Monument to Alphonso XII." might pass very well as a silver centre-piece on a small scale, but as a monument on a large scale it is bombastic. The figure or "Don Juan Tenorio" is very clever, but perhaps the best thing among the illustrations given is the head of "Tullia," a very characteristic conception, and quite sculpturesque in style. A very sympathetic article on Dalou is given by Professor Lantéri, and one by Mr. F. Hamilton Jackson on "The Metal-Work of an Architect and Designer," viz., Mr. T. R. Spence, who has done a great amount of metal-work design on a large scale and of very fine character. In these days when we hear so much about art being only the work of the craftsman, one is glad to find a writer frankly saying, as Mr. Jackson does, that "in metal more than in any other craft it is better for designer and craftsman to be separate" :—

"The noise and jar of the blows on the anvil are trying to the nerves of men of sensibility, and much use of the hammer tends to make the drawing of delicate curves a matter of great difficulty, as the hand is liable to shake and the fingers to lose that perfect control of the point which takes years to acquire and is so valuable to designer and draughtsman."

Quite true, we think ; and it requires some little independence to say so at present. An article on Mr. W. Telbin's sketches in tempera acquaints us with a side of this artist's work of which not much is generally known ; the illustrations from his landscape and sea studies in this medium are very interesting. The *Magazine of Art*, it will be observed, entirely ignores the special matter of public interest of this month ; the editor being of the opinion, apparently, that art may go its own way independent of coronations ; and we do not know but that this is the higher and more correct line for an artistic journal to take.

The *Architectural Record* (New York) contains an article on "An *Art Nouveau* Edifice in Paris," and on "Architectural Aberrations : No. 18, the Nassau-Beekman." The title "Architectural Aberrations" might much better be applied to the Paris building, one of those specimens of an architecture which looks as if everything about it had been half melted before being put up, so as to lose all sharpness and definition in a general rounding of all forms and serpentining of all angles. The building is the Humbert de Romans building, a kind of scholastic institution in Rue St. Didier, and the architect who is guilty of it is M. Hector Guimard, who has thus surrounded the early years of children with the architecture of bad dreams. We regret to see that the *Architectural Record* proposes to publish a series of illustrations of this "so-called new art," of which this is the first. The epithet "so-called" seems to imply that the editor is not very sympathetic towards the "new art" ; but if so, why start an expedition of illustrating it? If it is bad, every illustrated article on it only serves to familiarise people with it, and lessen the wholesome dislike to it. The American high building, the "Nassau-Beekman," which is called an "architectural aberration," is really a very ordinary affair, the sin of which appears to be that it is a conversion of an elevation representing originally a kind of brick quasi-Gothic architecture, which was then known as the Morse building, into a design more in keeping with the desires of the present day. Illustrations of the two phases of the building are given, but we do not know that one is either better or worse than the other, though it is evident that the transmogrification was not worth making. In contrast with these, it is refreshing to turn to the article on "A Villa at Capri," that built for himself by an American artist, Mr. Coleman, under the title of the "Villa Narcissus." This seems to be a house built or added to to indulge the owner's artistic fancy and to form a home for his art-treasures. But here the spirit of Italy seems to have presided over the details, which, though varied, have none of the unrest and distortion of the *art nouveau*. The illustrations of interiors in the house of Mr. H. W. Poor, of which Messrs. McKim, Mead, & White are the architects, convey the idea of a dwelling with a great variety of rich and fine interior details, all which is controlled by a sound and consistent artistic taste. The illustrations are given partly in relation to an article by Mr. Croly on "Rich Men and their Houses," a subject of more practical significance in America than in England, where we have so few rich men, or at all events so few who build houses. Mr. Croly seems to imply that what the rich American looks for in his costly home is not so much artistic quality in the abstract, of which he seldom professes to be a judge, as an atmosphere of the past brought round him. "His desire to be fortified in his purchases by the solid ramparts of a European reputation is the salient fact about his interest in plastic and decorative art," particularly in regard to the things with which he is surrounded at home :—

"The man who twenty-five years ago was perhaps a penniless office-boy eats his meat from a table at which the Bourbons may have dined, and toasts his feet at a fireplace that may have kept the Malatesta warm. It is a curious contrast—all the more so when one considers, not only the æsthetic contrast involved, but also the ecomic and moral contrast. The man sitting in that high-backed gilded French chair reading his morning paper may have a personal income much larger than that of any of the Italian potentates of the Renaissance he is paying for his chairs, his tapestries, and his fireplaces a sum that, had Lorenzo Medici paid them, would have made the Italian politically powerless ; and he is paying these sums for objects which in themselves he does not particularly value What he wants, as I have pointed out before, are the associations and the background He has more of the connoisseur's enthusiasm for the thing itself its exquisite proportions, its delicacy of colour or

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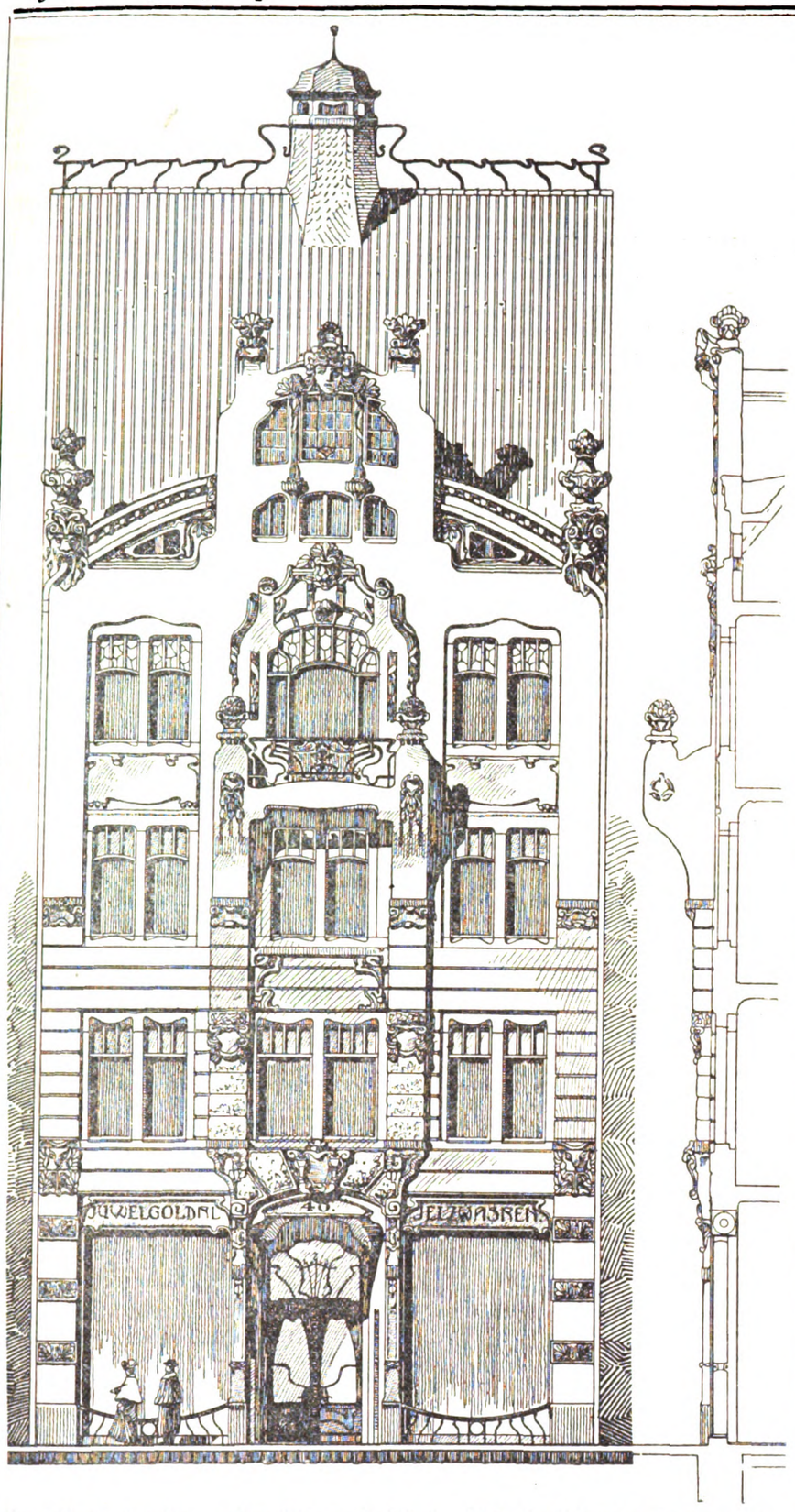

Street House, Dresden. Herr Thüme, Architect. (Reproduced from an Illustration in the "Architektonische Rundschau.")

its refinement of detail; and his self-distrust gives him the knowledge of his ignorance. Consequently he uses the same method to buy them that he would in the case of a mine, the value of which he was doubtful. Just as he hires an expert mining engineer to report on the value of the mine, so he hires the services of architects and decorators, who know the values of old tapestries and furniture; and he gives these experts commissions to buy the best things and plenty of them."

It is a curious and certainly not a very satisfactory trait in national life. The writer of the article only ventures to hope that the children of these purchasers of old things may acquire some individual taste of their own, and endeavour to impress their own character and taste on their houses, instead of merely purchasing or imitating old things that are warranted correct and orthodox.

But the most interesting article in the *Architectural Record* is that by Mr. Montgomery Schuyler on "The Art of City-Making," a subject to which the Americans are giving increasing attention. It is chiefly concerned, however, not with the general principle, but with the past and future application of it to Washington. It appears that there was a distinct method in the original laying-out of Washington, under the advice of one L'Enfant, who from his name one would judge to have been a Frenchman, and who seems at all events to have endeavoured to bring to the laying out of the capital of the States the ideas as to centralisation and axial arrangement of the principal streets and buildings to which the French pay so much attention. The following are the observations of L'Enfant on the margin of his plan for the general laying out of the city:—

"I. The positions for the different edifices, and for the several squares or areas of different shapes, as they are laid down, were first determined on the most advantageous ground, commanding the most extensive prospects, and the better susceptible of such improvements as either use or ornament may hereafter call for.

II. Lines or avenues of direct communication have been devised to connect the separate and most distant objects with the principal, and to preserve through the whole a reciprocity of sight at the same time. Attention has been paid to the passing of these leading avenues over the most favourable ground for prospect and convenience.

III. North and south lines, intersected by others running due east and west, make the distribution of the city into streets, squares, &c., and these have been so contrived as to meet at certain given points with those divergent avenues, so as to form on the spaces 'first determined' the different squares or areas

His system was that of diagonal avenues superposed on a rectangular street plan; the Congress House being considered as the most important point, and the centre of such a radiation of streets that no fewer than sixteen vistas converged upon it or were closed by it. The President's house was second in importance, and was the centre of another system of vistas. The original plan, though apparently retaining some of these initial features, has been much defaced and obscured by streets laid down with no reference to a general idea; and it appears to be an object now to revive and re-make some of the grand features of vista and effect which were originally intended. The most important point mentioned is that L'Enfant had kept a wide strip of ground, from the Congress House to the Washington Monument, and known subsequently in Washington as "the Reservation,' which was intended to be laid out as a grand avenue—a strip of land a mile and a half long and 1,600 ft. wide, the primary intention of which seems to have been forgotten and the land to some extent encroached upon. We gather from Mr. Schuyler's article that there is an intention to reclaim this land, still to a considerable extent open, and put it to the use for which it was originally intended. Other grand schemes for architectural vistas are described and illustrated, and if carried out ought to make Washington one of the stateliest cities in the world. Among them is a proposed Pantheon* to the founders of the Republic, to face the White House at a distance of about a mile; and a Lincoln monument, somewhat in the form of a classic temple, to be seen at the end of a vista of basins, fountains, and parterres, with a forest of trees on each side, and the Potomac seen in the rear. We hope these really fine and stately schemes will be carried out successfully; they are full of promise.

The latest issue of the *Architektonische Rundschau* contains examples, some of which we have already seen illustrated in the *Berliner Architekturwelt*, of the eccentricities into which modern German architecture is running. As one example we reproduce the front and section of a new street dwelling-house in Dresden, by Herr Thüme (the ground-floor is obviously a shop, but the whole is entitled "Wohn-haus"). To English tastes this is simply horrible (or we hope so), but apparently this kind of thing has a following in Germany. Among illustrations of a more sober school of architecture is the front elevation of the Land-und-Amstgericht at Magdeburg, by Herr Thoemer of Berlin—a design comparatively restrained but also very thin and wiry in style; and a church at Hainsburg, near Dresden, by Herr Reuter of Dresden, in Romanesque detail with a rather pretty spire in successive stages of wall and bulbous roofing, after the manner of the country, ending in a long spike with a weather-vane at the top. As usual, English architecture is entirely ignored; even the Westminster Cathedral does not seem to have penetrated to the knowledge of the *Rundschau*; but there is evidence, in some small illustrations in the letter-press, that the existence of America is recognised.

In the *Berliner Architekturwelt* the "Villa in Südende" by MM. Spalding and Grenander,

* "Panthéon," with the accent, if you please, so as to appear properly French! We print "Panthéon" in these pages when we specially refer to the building in Paris, because it is strictly correct in that case; but it seems rather absurd to carry the French accent across the Atlantic, in connexion with a word not originally French but Greek. Such is the desire of good Americans to Frenchify themselves, even in their architectural phraseology.

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of Berlin, is a sober-looking sensible country house design, with none of that gew-gaw work in barge-boards, &c., which generally makes both French and German "villas" so restless and uncomfortable in effect; over the interior details, unfortunately, is the trail of "l'art nouveau." Herr Hoffmann's "Gemeindeschule" in the Wicklefstrasse is also an admirable example of plain solid building, depending for its effect on massive walling, an effective grouping of windows, and the contrast of texture produced by treating part of the upper portion of the wall with a smooth cement face, a dentil cornice forming a base to this portion; though of the severest architectural treatment, it has not the depressing and prison-like effect of a typical French "Lycée." The "Lehrer Wohnhaus" (masters' or professors' house) in the Emdenerstrasse, by the same architect, has the same admirable qualities; two stories of massive rusticated masonry in the lower portion, contrasted by an upper story of pilasters and pedimented windows in rubbed ashlar, with delicately profiled balustrades, and widely-projecting bracketed eaves above. We wish there was more of this severe and carefully considered architecture to be found in the illustrations of German architectural publications. The same number includes a considerable variety of decorative design for furniture, metal-work, &c., all clever in a way, but *too* clever; all marked by the desire to do something unexpected and out-of-the-way.

The *Engineering Magazine* contains "A Comparison of Coal-Resources and Coal-Getting," by Mr. A. S. E. Ackermann, the comparison being between the conditions prevailing in the coalfields of Great Britain and the United States. It is pointed out that the extensive coalfields of America are "practically untouched," only the thick and upper seams being worked at present, and these to a large extent with little thought for future generations. The significant remark is made that in spite of the much easier natural conditions that hold in the United States, machinery is being used there to a very great and increasing extent, whereas in England, where coal-getting is more arduous, far less machinery is used. Now that labour representatives are publicly advising miners to withdraw their objections to the employment of machinery we may hope to find an increased use of mechanical appliances in this country. Many of the differences in practice to which Mr. Ackermann refers are unavoidable because of the different local conditions, but he is right in emphasising the superior facilities afforded for transport by American railways, where he says, "the 50-ton pressed steel car is a familiar and fine sight." Another article in the issue, by Signor Enrico Bignami, is descriptive of the Vevey-Mont Pélerin Funicular Electrical Railway, an undertaking which, owing to exceptional circumstances, demanded an unusual combination of power agencies, such as the gas generator and gas engine, electric-power transmission, the storage battery, and cable traction. Although the line is less than one mile in length, it possesses several interesting structural features, in addition to the varied mechanical and electrical equipment mentioned.

In *Feilden's Magazine* there is a useful article upon "Ventilation and Humidity in Mills and Factories," by Mr. H. R. Carter. The greater part of this article relates to artificial humidification as practised in textile industries, but some of the information incidentally given is worthy of notice by our readers. In referring to the vacuum and plenum methods of artificial ventilation, the author correctly approves the latter, of which the chief advantages are that draughts are less prevalent, and that the purity of air introduced can be better ensured. An article of considerable interest, on "Compressed Air and Bore Wells," by Mr. William H. Maxwell, deals with the use of compressed air in connexion with the Corporation Waterworks at Tunbridge Wells and other places. The system is one lending itself to almost indefinite extension, as a large number of wells within a considerable radius may be operated from a central plant. The machinery described is excellently illustrated by reproductions of working drawings. We cannot help thinking that the second part of this contribution on "bore wells" might have been treated more adequately in the form of a separate article. Although the subject is closely allied to that of the compressed air-lift, it seems somewhat lacking in sequency, and is of rather fragmentary character.

In the *Antiquary* Mr. Bailey's "Ramblings of an Antiquary" deal with Breadsall Manor-house, of which a sketch is given in its present state, and further illustrations of some heraldic carvings in the church, one of which we are sorry to learn has disappeared since the sketch was made. The Rev. Rosslyn Bruce writes "The Legend of the Coronation Stone," supplementing it with the geological opinion of Professor Geikie in favour of the stone being "from the Red sandstone districts of Eastern or Western Scotland," and at all events "almost certainly of Scottish origin," thus supporting on scientific grounds its claim to be the original coronation stone of Scone. Mr. W. B. Wallace contributes an interesting historical sketch of "The Fortunes of Cyrene."

In the *Century*, Mr. W. H. Pickering (assistant Professor of Astronomy at Harvard) writes an article on "The Canals in the Moon," of which we had not heard before, and of which no illustrations are forthcoming which are in any way comparable to the "canals" (so-called) of Mars. The object of the article seems to be to deprive the Mars "canals" of any possible connexion with life on the planet, by the argument that there are similar appearances in the moon, where we have long ago given up life. The article seems wrongheaded and perverse, and written rather with a view to discredit some popular conceptions than to serve the cause of scientific truth. The article on "A Great Civic Awakening in America" brings us again to the subject of the beautifying of towns and their environs which we have already referred to as being so much taken up in the United States; but we fear there is rather too much of an idea of manufacturing the picturesque on preconceived lines and by the operation of societies and institutions *ad hoc*; an enterprise which is rather apt to defeat its own ends. We have a picture of "An Artistic Hostelry presented to the Town of Templeton," and "A Manufacturing Plant, with Trees arranged for Picturesque Effect," &c. All this seems too self-conscious a system, and one which is rather likely to degenerate into a craze. The same number contains an article by Mr. F. W. Skinner on "Triumphs of American Bridge Building," with a number of photographs of large bridges in process of construction; it is a popular view of the subject, but may interest architects nevertheless.

Harper contains, under the title "Autobiography of the Stars," a paper on Harvard observations in telescopic photography of star spectra. The spectra given as illustrations are new, the substance of the article is mostly somewhat old—merely a popular outline of what most persons at all interested in astronomy are familiar with by this time.

Scribner, under "The Field of Art," contains an article on an exhibition of small bronzes by American sculptors, by "R. S." (Mr. Russell Sturgis, we presume) which is the occasion for some thoughtful criticism on the difference between the conditions of life-size sculpture and statuettes, especially to the effect that the nude becomes of less importance in miniature sculpture, while costumed figures can be tolerated which would hardly be tolerated in life-size sculpture; a position which is emphasised by some of the illustrations given.

The *Fortnightly Review* contains (and we regret to see it) an example of the current lunacy—for we can call it no less—about Rodin, in the shape of an exaggerated and highflown article by Mr. Arthur Symons, who, like some other poets and literary critics, seems to imagine that the faculty of literary expression, the capability of writing in an effective manner about art, gives them *ipso facto* the right to lay down the law upon art, and to regard their own rather hysterical fancies as facts. It is melancholy to find this kind of art-criticism (?) admitted into a review of the standing of the *Fortnightly*.

In the *National Review* Mr. A. J. Finberg's article under the title "Elementary Exercises at the R.A.," though certainly neither enthusiastic nor hysterical, is an example of the flippant order of literary criticism of painting, in which the main effort seems to be to hold painters and painting up to ridicule. Sir L. Alma-Tadema is described as nothing but a painter "writing a good hand." In any case, is that nothing? Remember the "O" of Giotto. But does it occur to a literary critic to realise what is the labour that has gone to achieving such a power of representation in painting, and (still more) what is the amount of study of the past which has been requisite to enable the painter to know his ancient Roman detail and personages in this way, and revive them for us? In a similar spirit he speaks of Mr. Orchardson's "Borgia" as if it were nothing but the adroit painting of glasses and table accessories, ignoring the real tragic power in the picture, the sinister effect of the whole scene, with the thick roof of foliage casting its shadow over the crime. Painters can very well afford to disregard this kind of criticism. The best painter is he who paints best.

The *Monthly Review* contains a prettily-written article on the fascinating subject of "Musical Instruments in Italian Pictures," by Mrs. Kemp-Welch, with some illustrations. It is not an article that proves anything on the subject of actual Renaissance instruments, and in fact we rather doubt whether the representations of instruments in early Renaissance pictures can be accepted as accurately representing the instruments of the period, though they may furnish hints. The interest of the subject is mainly picturesque; but, as the writer says, these representations of music-making angels seem to give us of the present day a faint echo from another world, "the murmuring of sweet music, like the murmuring of a sea-shell, telling us of a beautiful conception of life which has been and has passed away."

The *Pall Mall Magazine* is emphatically a Coronation number, and gives a good many interesting illustrations of old Coronation ceremonies and costumes, and an article on "The Crown as a Symbol," with drawings of some English crowns of different dates.

In the *Gentleman's Magazine* Mr. A. C. Coxhead gives some information on "A Forgotten Art Critic," John Williams, who wrote under the name of "Anthony Pasquin," at the latter end of the eighteenth and the beginning of the nineteenth century. Williams was a scurrilous and abusive critic, who would have been soon extinguished under actions for libel in the present day; but he certainly had perceptions, and appears to have at once recognised Turner, in his earlier exhibited works, as an exceptional artist. Some of the quotations from his critiques are curious reading now.

The *Revue Générale* contains, under the title "Un Pelerinage de Nature et d'Art," a short paper by M. Freson which may interest some of our readers; it is a visit to the scenes in which Beethoven composed or first imagined the Pastoral Symphony, in the neighbourhood of Heiligenstadt, and an attempt to identify the actual brook which suggested the second movement of the symphony.

The *Leisure Hour* gives an article on "The Lions of England" (heraldic lions) written by an architect, Mr. E. Hill, giving a good many characteristic examples of the heraldic lion from old sources.

ART TEACHING IN SECONDARY SCHOOLS.

THE following is extracted from the last issue of the regulations of the Board of Education in regard to Secondary Day Schools:—

"Schools of Art.

XXXVIII. A school of art is one in which instruction in art is carried on methodically for about forty weeks in the year.

The school year will be held to begin on August 1 and to terminate on the following July 31. Managers must keep a record of the students who join the school. They are responsible for the accuracy of the registration of the attendance of all students who receive instruction. For detailed rules see Supplementary Regulations.

The work of the school must be carried on under the recognised teachers in day and evening classes. The day classes must meet on at least two days a week for two hours at each meeting, and the evening classes must meet on at least three evenings a week for two hours at each meeting.

There must be a principal teacher holding an art master's certificate (I.). Specially qualified persons may be exceptionally recognised. The qualifications of other teachers must be submitted to the Board for their approval.

'In cases of the principal teacher's illness the Board may, under certain conditions, provide a substitute from the Royal College of Art.'

The rooms of a school of art must be approved by the Board and must be devoted wholly to art instruction. They should be well lighted for drawing from plants and the life,

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for painting and for modelling, and suited for elementary and other study and instruction in ornamental and decorative art. The school must be properly equipped for the work included in its curriculum. The managers must submit (on the prescribed form) the time-table and teaching staff for approval as soon as possible after August 1 and not later than September 1.

"It is advisable that a curriculum specially adapted to the needs of the locality should be framed and followed.

Note.—The Advisory Council for Art have drawn up specimen courses, which will be found in the Appendix to the Supplementary Regulations, and have indicated in the prospectus of the Royal College of Art suggestions of a manner in which various branches of study and work in art may be co-ordinated.

The Council consider that as a rule students at a School of Art should have passed through instruction corresponding with that of the primary course in drawing (pencil and brush work) and modelling, and be qualified for work in the secondary (*i.e.*) advanced course, the more efficient students taking work in further special courses."

THE LONDON COUNTY COUNCIL.

THE ordinary meeting of the London County Council—the first since the Whitsun tide holidays—was held at Spring-gardens, on Tuesday, Mr. J. M'Dougall, presiding.

Loans.—The following loans were, on the recommendation of the Finance Committee, granted:—1,250*l.* to Chelsea Borough Council, for paving works; 26,100*l.* to Hampstead Borough Council, for electric lighting and meters, and 1,710*l.* for works at the baths; 95,642*l.* to Stepney Borough Council for electric light installation, street lighting, and meters; 3,345*l.* to Battersea Borough Council for works at baths; 200,000*l.* to the London School Board for new schools; 2,900*l.* to Woolwich Guardians for furnishing children's homes; 12,800*l.* to St. Pancras Guardians for receiving home for children; 3,000*l.* to Stoke Newington Borough Council for electric light installation, street lighting, and meters; and 2,000*l.* to Marylebone Guardians for additional expenditure on workhouse.

Money Under Contracts.—The General Purposes Committee reported that the engineer had called their attention to the inconvenient operation of standing order 200 in the case of the contracts for machinery. By this order, sureties were required, but they recommended the adoption of a more simple and efficient course, namely:—

"That standing order No. 200 be amended by the addition of the following paragraph:—The foregoing system of payments shall not apply in the case of contracts for machinery, and in such cases payments shall be made as follows:—50 per cent. on delivery of the machinery, 25 per cent. after it has been erected, 15 per cent. after the trial or testing of the machinery, and the balance after the expiration of the prescribed period of maintenance."

This was agreed to.

Ranelagh Storm Relief Sewer.—The Main Drainage Committee reported that the soffit of the arch of the Ranelagh storm relief sewer was cracked for a length of about 400 ft. near the outlet into the river Thames, and that part of the crown had lifted. It was necessary that the cracked parts should be cut out and made good, and that additional concrete should be placed over the sewer in the shallow ground. The Engineer also suggested that a side-entrance should be built at the same time, with a view to providing better access and ventilation to the sewer. The cost of the work was estimated at 450*l.*, and as the amount was covered by the provision made in the estimates for the current financial year in respect of repairs to sewers, they recommended "That an expenditure of 450*l.* be sanctioned for the execution of repairs and the formation of a side-entrance to the Ranelagh storm relief sewer near the outlet into the river Thames, and that the work be carried out by the Works Department as a jobbing work."

This was adopted.

The Works Department.—The Works Committee reported that they had considered as to the percentages to be added to the cost of estimated works executed by the Works Department and completed subsequent to March 31 last to cover general and establishment charges, and had come to the conclusion that the addition to the expenditure on wages and materials charged to each work of 1⅜ per cent. in respect of general charges, and 4¼ per cent. for establishment charges, would be sufficient to cover the expenses chargeable to the general and establishment charges accounts for the current financial year. They had accordingly adopted these percentages. The corresponding figures for the year 1901-2 were 1⅜ and 4¼ respectively. They would consider in October next whether it would be necessary to alter the percentages in consequence of the amount of work executed by the Department during the year being greater or less than was at present estimated. They had also considered as to reducing the percentages hitherto added to the cost of jobbing works to cover general, establishment and plant charges. These were as follows:—Use and waste of plant, 5 per cent.; general charges, 2½; establishment charges, 10; but as they might safely be reduced to 3, 2, and 8 respectively, they had reduced them accordingly as from April 1, 1902, except in the case of dangerous structure works, where the alteration took effect from June 1, 1902.

The same committee reported that the vote for general stores required for stock was nearly exhausted, and it was necessary for them to obtain forthwith a further vote of 2,000*l.* to cover future expenditure. The Council was doubtless aware that the cost of these stores was ultimately defrayed out of the votes for the works upon which they were used; but under the statute a vote for their cost must be passed by the Council upon an estimate submitted by the Finance Committee before they could be purchased, even though they might only remain in stock for one day. They recommended "that the estimate, amounting to 2,000*l.*, be approved, and that the Works Committee be authorised to purchase general stores at a cost not exceeding the amount of the estimate."

This was agreed to.

Deepening Wells.—The Asylums Committee reported that the Council on October 15 sanctioned the expenditure of 4,000*l.* for the deepening of the well at Colney Hatch Asylum in order to assure a sufficiency of water. They now report for the information of the Council that they invited tenders from the undermentioned firms, all of whom responded with the exception of Messrs Isler—Messrs. S. F. Baker & Sons, Mr. R. D. Batchelor, Messrs. T. Docwra & Sons, Messrs. C. Isler & Son, Messrs. T. Tilley & Sons. They accepted the tender of Messrs. T. Tilley & Sons for this work on a schedule of prices, it being the lowest. They had considered it desirable, in order to prevent the possibility of percolation, to fix additional cast-iron cylinders in the well in connexion with the deepening, and they had accordingly invited tenders for this work. A provision of 2,000*l.* had been made in the estimate for the money bill for this year, and subject to the necessary expenditure being sanctioned, they had accepted the tender of Messrs. Tilley & Sons for that part of the lining to be carried up to within 10 ft. of the surface, their tender (987*l.* 10s.) being the lowest in this case also. For a distance of 15 ft. below the surface the work would be executed by the Committee's staff. It was probable that considerable rearrangement would have to be effected in the vicinity of the well near the surface—shutting off existing drains and constructing the glazed brickwork above the cast-iron lining. No estimate could be formed of the cost of this, but provision was included therefore in the sum of 2,000*l.* now asked for. They recommended—"That the estimate of 2,000*l.* submitted by the Finance Committee be approved."

This was adopted.

Hanwell Asylum.—The Asylums Committee reported that they had had under consideration the question of centralising the boiler plant for supplying the energy required for power and heat at the main asylum buildings. "The matter," they said, "has been brought to our notice recently, as some of the existing boilers will shortly require renewal owing to their age, and as centralisation seemed to promise economy both in working and coal consumption, we directed the Asylums Engineer and Resident Engineer to prepare a scheme before undertaking the renewals referred to. If centralisation is not carried out, the estimated expenditure for renewals during the next three years is 3,600*l.* in respect of five steam and three hot-water boilers. The large number of separate stokeholds under the existing arrangements require the presence of stokers at all parts of the asylum buildings, and this causes considerable complication and difficulty in arranging the mealtimes and periods of rest for the men. At the present time twenty boilers, with twenty-two furnaces in twelve different stokeholds, are used for this work, and the staff of stokers employed averages nine throughout the year. The scheme prepared by the engineers provides for the use of only two of the existing boilers, and for the laying down of three new boilers of the Lancashire type, each 22 ft. long by 7 ft. 6 in. diameter, and capable of working at a pressure of 100 lbs. to the square inch—a total of five boilers with ten furnaces, for the working of which a staff of five men would be sufficient. A saving of about 300*l.* per annum in wages would result from the reduction of staff, and, at present prices, an annual reduction of probably 300*l.* would also be effected in the coal bill. The warming of the temporary buildings will still be carried out by the independent system of boilers put down in 1897, but the steam required for all the main connected buildings will be obtained from the boilers included in this scheme.

The approximate cost of the whole work, including buildings, boilers, and fittings, is 10,250*l.*, and the whole undertaking would probably take three years to carry out, but its execution would create but little disturbance in the buildings occupied by patients.

A first provision of 6,650*l.* has been included in the estimate for the Money Bill. It is necessary, however, to have drawings and bills of quantities prepared before an estimate of cost can be submitted to the Council, and for this a preliminary sum of 500*l.* will be required. We recommend 'that the estimate of 500*l.* submitted by the Finance Committee be approved.'"

This was adopted.

District Surveyors.—The Building Act Committee recommended the appointment of Mr. Percy Hunter as District Surveyor for Lambeth (South), Mr. Clarence T. Coggin for Lambeth (Central) and Battersea (North), Mr. O. C. Hills for Hackney (North-East), and Mr. A. H. W. Glasson for Lower Norwood. This was agreed to.

New Fire Float.—The Fire Brigade Committee reported that the Council having decided that tenders shall be invited by public advertisement for the construction of a second self-propelling fire float, the Chief Officer suggests that a naval architect should be employed to prepare the necessary design, specifications, and quantities, and to supervise the construction of the vessel. It may be mentioned that when tenders were invited for the float now known as the *Alpha*, there was supplied to each firm a drawing and an outline specification prepared by the Chief Officer, and that the Council paid the sum of 20*l.* to each firm (with the exception of the firm whose tender was accepted) who submitted detailed drawings and specification of the craft. It is suggested that if the course now proposed be followed, not only will tenderers know exactly what is expected of them, but that the Council will be fully protected in the event of the work being entrusted to a firm which has no experience in the construction of a vessel of the type in question. It is desirable that the construction of the vessel should be carefully supervised, and the chief officer has no staff for the purpose, and cannot afford the time to personally attend to the work. Two naval architects have given quotations. Mr. F. J. Trewent offers to furnish the design and full specification and plans, and to supervise the vessel under construction for a fee of 225 guineas, if the order be placed in the London district, the actual amount of travelling expenses whilst surveying to be added in the event of the order being placed outside such district. Mr. J. H. Biles' quotation for the same work is 5 per cent. of the contract price. We recommend:—

"That Mr. F. J. Trewent be employed, in consideration of the payment of a fee of 225 guineas."

This was adopted.

Electric Generating Station at Greenwich.—The Highways Committee reported having had under consideration the question of the manner in which water required for feeding the boilers of the electricity generating station to be erected at Greenwich may best be obtained. The cost of obtaining the water from the available public supply when the station is finally completed would be between 5,500*l.* and 6,000*l.* a year, and it had been suggested

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that, in order to avoid the necessity for this large expenditure, surface condensers should be used at the station, and water obtained by means of a well to be sunk on the site. Should this course be adopted, it was anticipated that the annual cost of providing water for the feeding of the boilers would not exceed 300*l.*, but it would be also necessary to provide, at a cost estimated at about 300*l.* per annum, a large amount of water for the general purposes of the station, so that the total annual cost for water would be about 600*l.* They had obtained prices from four firms experienced in boring work, and, assuming that the boring would be 300 ft. deep, these prices, which would be less should suitable water be found at a higher level, worked out as follows :—Messrs. Le Grand & Sutcliffe, 310*l.* for 8½ in. bore-hole ; Messrs. Merryweather & Sons, 395*l.* for 9 in. bore-hole ; Messrs. C. Isler & Co., 545*l.*, for 10-in. bore-hole ; Messrs. Dowcra & Co., 592*l.* for 9-in. bore-hole.

The Committee recommended that Messrs. Le Grand & Sutcliffe carry out the work, and this was agreed to.

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—The concluding meeting of the session was held on June 4, Dr. W. de Gray Birch, Hon. Treasurer, in the chair. The Rev. C. H. Evelyn-White produced some antiquities for exhibition, and made the following remarks upon them :—"The ancient Aldreth bridge that formerly spanned the water of the old West river, connecting Cambridge with the Isle of Ely, is being rebuilt after a period of long decay which led to ultimate extinction. The excavations have brought to light the piles upon which the original bridge was probably built, with ponderous pieces of undressed timber and two immense oak beams upon which the structure was mainly carried. The much-corroded blade of a short iron sword (certainly not later than Norman date), an adze, and other like implements have been found 4 or 5 ft. below the surface of the river bank by the site of the bridge." Mr. White exhibited oxidised portions of a dagger, with part of the wood handle adhering, and what appears to be an awl or "pricker" encased in iron (which may belong to the Anglo-Saxon period), two horseshoes (Norman), one fancifully scalloped, the shoes being considerably narrower on the one side than on the other. Fragments of ironwork used in the construction of an early bridge were also shown. Of the animal remains that have been found, Mr. White exhibited some remarkably fine specimens, including the tusk of a boar, and teeth—possibly of some extinct species—so blackened by contact with the fen peat as to resemble jet. Some examples of extinct fresh water shells, which were found in abundance, were also shown, together with some interesting fragments of Roman-British and later pottery. The Aldreth bridge is famed in history by Hereward's resistance to the Conqueror, and by the passage of King Stephen, who assisted the Bishop of Ely when he espoused the cause of Matilda. The Rev. H. J. D. Astley exhibited some flint chippings and pieces of bone, hollowed out, from the caves of La Madeleine, France ; also some good specimens of the crown and half crown pieces of William III., and a book dated 1723, "Memoirs of the Antiquities of Great Britain," with interesting engravings. A paper was contributed by the Rev. H. J. Dukinfield Astley upon "Tree Worship : Its Ancient Rites and Modern Survivals, particularly in the British Islands." The writer dealt very extensively with the subject, which, indeed, is a very wide one, covering a large field of argument. He, however, co-ordinated the various branches, and from customs still surviving within our islands—although in a mutilated fashion—endeavoured to deduce the origin and meaning of "tree worship" in the past. The researches of Mannhardt, Bottisher, Professor Tylor, Mr. Arthur Evans, Dr. Phene, and others whose writings were referred to, have produced a vast store of facts from all parts of the world to prove the universal prevalence of "tree worship" amongst primitive peoples in all ages. In Ireland sacred trees are met with in many localities, and are of a variety of species. The mountain ash is in that country popularly supposed to possess a peculiar virtue against the attacks of fairies, witches, or other malign influences ; while to cut down a whitethorn tree is considered exceedingly unlucky, and "Don't tamper with the lone bush" is a rustic warning common everywhere in remote parts of Ireland to-day. Mr. Astley concluded a very interesting paper with an earnest plea for the establishment of an "Arbor Day" as an annual festival, national and universal, for the planting of trees, and suggested that the day of the Coronation of King Edward VII. would be a most suitable date, and he commended the idea to the already existing "Arbor Day Society." Trees are no longer worshipped, and we do not want the Pagan Associations which seem to be revived in the new national festival of similar character in Italy, but it is certainly necessary to do something to prevent further denudation of our woods and forests, and to maintain the beauty of our English countryside, while the establishment of an annual "Festival of the Trees" would be a source of innocent enjoyment and do something to mitigate the dullness of English twentieth century country village life. In the discussion which followed the paper, Mr. Gould, Mr. Compton, Rev. C. H. Evelyn-White, Mr. Williams, Mr. C. R. B. Barrett, Mr. Lyttleton, and others took part. Mr. Worsfold mentioned that trees were worshipped in Brittany as late as the seventeenth century, and now in Devonshire the people invoke blessings upon the apple trees.

ROYAL ARCHÆOLOGICAL INSTITUTE.—General meeting, Wednesday, June 4, Sir Henry H. Howorth, President, in the chair. Mr. Kennard exhibited two bone implements found lately at London-wall, and possibly designed for polishing bronze needles. Mr. J. T. Robins exhibited a Roman urn made of marble, of unknown origin, bearing the following inscription : — "DIS . MANIBVS . QVINTI . FABI . FELIC . CONS." Mr. Herbert Jones showed a quantity of pottery, &c., from Greenwich Park. He explained that traces of Roman occupation having been discovered in Greenwich Park early in the present year, the permission of the Commissioners of Works and Public Buildings was obtained to make a further search. A good deal of work has been done there during the last three months, resulting, in the discovery of the remains of a building, unfortunately in a very imperfect state. Parts of three concrete floors were unearthed at a depth of about 2 ft. under the surface, but only one block of walling. This is built of ragstone set with wide joints in white mortar. Only the first of the floors found had any tesseræ remaining, the upper surface of the others was quite destroyed, but was probably of Opus signinum. Many antiquities were discovered : about 400 coins, one of Marc Antony, the remainder ranging from Claudius to Honorius, a coin of Constantine being of great rarity. The right arm of a statue, probably of a female, in oolite, also some fragments of marble, with inscribed letters, certainly of two, and probably of three, dates ; the head of a small ivory figurine, holding a shield aloft ; mouldings in oolite and sandstone, besides large masses of roofing material, wall plaster, floor concrete, and the usual Roman débris, including oyster-shells. The excavations are for the present suspended, but everything found *in situ* is left open (railed round) for public inspection, and it is intended to recommence excavations in the autumn. Dr. Robert Munro read a paper on the "Domestication of the Horse in Prehistoric Times." Dr. Garson, Mr. Green, and Mr. Hilton took part in the discussions on the papers.

DURHAM AND NORTHUMBERLAND ARCHÆOLOGICAL SOCIETY.—A large number of members attended the first out-door excursion of the season of the Architectural and Archæological Society of Durham and Northumberland in the neighbourhood of Darlington on the 5th inst. The party visited Eryholme, Sockburn, Dinsdale, and Haughton-le-Skerne under the guidance of the President, the Rev. Canon Greenwell. The features of Eryholme Church, situate nearly opposite Hurworth, on the Yorkshire side of the river Tees, were described by Mr. Hodges, who expressed the wish that the party had seen the church before it was restored. It was Norman, except the chancel and porch. No Norman windows now remained. The visitors drove through the Tees at Neasham Ford to Sockburn Hall, the features of which Canon Greenwell described. He said that from its name and other causes he deemed it to have been a fortified place. There were remains of pre-Conquest times. There were numerous remains of things which had stood in the cemetery, the sepulchral crosses and covers of graves being exceedingly interesting. In 883 Guthred, King of Northumberland, gave Sockburn to St. Cuthbert, who had been instrumental in saving him from slavery. It remained in the hands of the Church until the times of Bishop Flamberd, who, probably about 1,100, gave it to Roger de Conyers, whose descendants held it for some centuries, and who, though so numerous at one time, had become extinct. The gift was made on condition that a falchion was presented to each new bishop. There was an ancient falchion at the hall, but that was not of that period, but later. The estate was given in consideration, it was said, of Conyers killing the great wyvern, or "worm" which devastated the country and killed man, woman, and child. The fashion by which the estate was held was presented first at Neasham Ford, where the Bishop entered the diocese, and later at Croft Bridge, the Bishop handing it back again. The falchion was handed round for examination by those present. Mr. Knowles put the date of the weapon at about 1200, there being few like examples in Europe. The party afterwards drove to Dinsdale Church, and to Haughton-le-Skerne.—*Darlington and Stockton Times.*

EAST HERTS ARCHÆOLOGICAL SOCIETY.—Several members of this Society visited some interesting buildings in the Stanstead-Gilston district on the 5th inst. According to the *Herts and Essex Observer*, the first place inspected was St. Margaretsbury. The church there was described by Mr. Septimus Croft, who remarked that the building as it now stands consists of a chancel and nave of equal width, and is said to be but one aisle of a much larger structure, which was a collegiate priory, probably dating from the latter part of the fourteenth century. He pointed out that the large bays had been filled up and gothic windows inserted. The marks of the openings of the bays could be seen from both inside and outside. The existing walls were no doubt part of the original structure, and the rough-hewn king-post beams were also part of the old building. The east window, of the Gothic Decorated period, had often been very much admired for its tracery, but the coloured glass put in some sixty years ago by the village glazier was decidedly inferior. The stone brackets and niches on each side were also probably of the earliest date. There were several memorial stones on the floor of the church. The party then drove to Rye House, where Mr. R. T. Andrews read a paper on the history of the house and manor, and in another communication the same author dealt with the "Great Bed of Ware." The next place visited was Stanstead Abbotts. The church is built in the Early English style, and contains its original high pews, which with those at Hexton are the only ones in the county. There is also a fine Late Tudor porch, and the churchyard is interesting as having been formerly a Roman burial place. The Rev. J. W. Lewis, describing some of the features of the church and parish, said the latter was called Stanstead Abbotts on account of its connexion with the Abbey of Waltham. A church existed at that spot as early as the year 1100, and it was granted to the Priory of Merton, in Surrey. The present building, dedicated to St. James, consisted of a chancel, nave, chapel on the north and square embattled tower. The nave and chancel were said to have been erected in 1350 or 1400, and the tower about a century later. The junction between the nave and chancel did not appear on the outside, but inside there were remains of the screen in one of the pews, the remains of a rood loft, and other indications of the dividing point. The font was of two dates. The chapel was built in 1577 by Edward Baesh, and in its east window were the arms of Queen Elizabeth. The advowson of the church passed from Merton to the Crown, and subsequently to Edward Baesh, at last coming into the hands of the present patron. In regard to the brasses in the church Mr. W. F. Andrews called attention to one on which the figures of a man and his wife were shown. The man was holding his wife's right hand, the left hand of each being held up in the attitude of affection. The only other instance in the county where a man was shown holding his wife's hand was at Great Berkhampstead. The date of the brass he was now describing was supposed to be 1540, but it was not known to whose memory it was fixed, as the inscription was gone. Another brass portrayed a man wearing a long legal robe. His name was

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William Saxaye, of Gray's Inn, gentleman, and he died at twenty-eight years of age in the year 1581. Another brass found buried beneath the floor of the aisle in 1899 showed a man in armour of the latter part of the fifteenth century. The probable date was about 1480. At the foot of the figure was an animal with the gills and teeth of a fish, the body and tail of a dog, and claws of a dragon. The inscription, unfortunately, was missing. Hunsdon Church was afterwards visited, and Mrs. J. E. Morris, of Bishop's Stortford, contributed an interesting description of the building. She said there were records to show that there was a church there in 1291, together with a rectory. In that year an inquisition was made by Pope Gregory IV., and it was found that the value of the rectory was 12 marcs per annum, the tithes being worth 24s. In the time of Henry VIII. it was rated at 12*l.*, in 1650 at 75*l.*, and thirty years ago the living was worth 280*l.* with a house. Roger de Waveney, in the time of William II. or Henry I., gave the church and that of Stanstead Abbott to the Priory of Merton in Surrey, in whose gift it remained until the Dissolution, when it passed to the Crown. Queen Elizabeth bestowed it upon her kinsman, Sir Henry Cary, since which time it had remained attached to the Manor of Hunsdon. The church consisted of a chancel and nave, an embattled tower containing a peal of eight bells; a chapel on the north side, now containing the organ, and also used as a vestry; and a mortuary chapel, built by Sir John Cary, on the south. From the style of the architecture the main building appeared to have been erected about the end of the fifteenth century, and Sir John Cary's chapel about the year 1600. Taking the various details of the church, Mrs. Morris said the east window of the chancel was Perpendicular, and filled with modern stained glass in memory of Felix Calvert, C.B., and N. R. Calvert, M.A., the latter of whom held the living from 1832-45. The recess in the north wall was probably an Easter sepulchre, with a later inscription. Mr. W. F. Andrews described the brasses in the church. The party subsequently drove to Gilston Church, a history of which was given by Mr. C. E. Johnston, and returned to Hertford in the evening.

COMPETITIONS.

CEMETERY CHAPEL, AUDENSHAW.—In the competition for chapel, registrar's house, shelter, and lavatories for the Audenshaw Cemetery, the District Council have awarded the first premium to Messrs. T. George & Son, Old-square, Ashton-under-Lyne, and the second to Messrs. Hepworth & Wilkinson, of Brighouse. Fourteen sets of drawings were submitted in the competition. The chapel, which is designed in the Gothic style, will be carried out in Huddersfield stone, with Westmoreland green slates.

THE ANNUAL REPORT OF THE PATENT OFFICE: 1901.

IN his Report for the year 1901 the Comptroller-General of Patents, Designs, and Trade Marks sets forth that the receipts from patents fees were 210,187*l.*, as compared with 204,140*l.* in 1900, being an increase of 6,047*l.*; from designs fees 3,432*l.*, an increase of 338*l.*; and from trade-marks fees 10,506*l.*, a decrease of 493*l.* The receipts from the sale of official publications (which are paid over to the Stationery Office) were 8,205*l.*, an increase of 346*l.* Thus the total receipts amount to 232,331*l.*, as compared with 226,091*l.* in the preceding twelve months—an increase of 6,240*l.* Since the whole expenditure, which includes 22,497*l.* upon structural works, 63,638*l.* in salaries to an effective staff of 318 persons, 4,412*l.* for pensions (non-effective list), 23,920*l.* for printing, and 2,400*l.* for stationery, books, and bookbinding for the Free Library, amounts to 125,040*l.*, as compared with 120,667*l.* in 1900, the surplus of receipts above payments is 107,291*l.*, showing an increase of 1,867*l.* In the period under review the new buildings, which, with the Free Library, were opened to the public in last January, were finished by Messrs Perry & Co., contractors, after designs prepared at the Office of Works; the only portion of the old offices is that on the north side of Quality-court, Chancery-lane, having a Classic façade, in Portland stone, designed, it appears, by Sir William Chambers, and in that case being his last work in London: that block is also marked for demolition to make way for the completion of the new offices. The new Patent Office buildings, their site, and equipment (6,800*l.*), have cost a sum estimated at 163,750*l.*, and about 159,000*l.* of that amount had been expended by the end of last year.

During the twelve months 26,777 applications were made for patents, as compared with 23,924 in the preceding year, 25,800 in 1899, 27,650 in 1898, and 30,952 in 1897. The number of applications lodged with "provisional" specifications was 20,816—an increase of 2,697. The number lodged with "completed" specifications was 5,961—an increase of 156, and the highest total under that head received hitherto in any one year. The aggregate of specifications deposited was 34,399, which is an increase of 3,187, or 10·2 per cent.

Of those applications there came from England and Wales 16,088; the United States, 3,246; Germany, 2,844; Scotland, 1,320; France, 948; Austria, 389; Ireland, 371; Belgium, 199; Canada, 195; Switzerland, 154; Sweden, 104; and Russia, 102. No other country contributed as many as 100. About 2·3 per cent. were made by women inventors, who sent about 150 connected with articles of dress, and twenty in respect of cookery and domestic economy. The figures testify to a large increase as regards the United Kingdom, Belgium, Canada, New South Wales, South Africa (Natal and Cape Colony excepted); but a slight decrease is apparent in respect of the United States, France, Germany, Russia, Victoria, New Zealand, Norway, South Australia, Western Australia, Switzerland, and Denmark. The current patents were lessened in the course of the year to the extent of 1,132, but patents were sealed upon 53·4 per cent. of the applications lodged in 1900, an unusually high percentage.

Turning to particular trades and industries the Comptroller-General states that whereas he finds evidence of a considerable revival of inventive activity in both cycles and motor-cars during the second half of the year, the textile industries, upon the whole, present a marked falling-off. A similar reduction is manifest in the case of automatical and non-automatical couplings, acetylene generators, and incandescent lamps; whilst for lace and lace-making, only three specifications were filed. On the other hand all the classes relating to electricity (galvanic batteries excepted) evince an advance, the most striking group being that which comprises switches, couplings, cut-outs, and cognate mechanism. All these classes, indeed, are generally at a higher point than any they have attained before, and amongst others which are now at their maximum we may cite those for steam engines, steam generators, furnaces and kilns, printing, lifting, railways, glass, and philosophical instruments; moreover, the inventions relating to blast and cupola furnaces are more than thrice as numerous as they were in 1900. The classes (there are 146 in all) that belong to the building and kindred trades are so many that a full analysis of the respective figures would make too great a demand upon our space. We will mention briefly that there is an increase over those for 1899 of "accepted" specifications for buildings, chimneys, fencing, electricity, gas distribution, hydraulic engineering and machinery, roads, ventilation, stoves, iron, glass, hand-tools, nails, and a few other heads, but a decrease on the side of closets, cements, locks and fastenings, mining, drains, cooking, fire-extinction, heating, hinges, stone, paints, &c.

As happened in 1900, the trend of invention has been largely directed towards electrical traction; motor-cars—more especially cars propelled with oil-motors—evince a great advance. Amongst other applications, within our own more immediate province, that have obviously been prompted or suggested by late events, are projects for obviating the vibration from "tube" railways. On January 1 last came into operation an Act, with new rules, that gave effect to recommendations made by a Committee of the Board of Trade for extending under certain conditions from seven to twelve months the statutory period for seeking protection under existing international conventions. The more important questions of novelty and priority of invention, as well as the difficult matter of the granting of licences for the working of patents, to which we adverted *passim* as having been reported upon by that Committee, still await determination by legislative enactment.

COMMONS AND FOOTPATHS PRESERVATION SOCIETY.

A MEETING of the Executive Committee of the Commons Preservation Society was held at 25 Victoria-street, Westminster, on Tuesday, the Right Hon. G. J. Shaw Lefevre presiding.

It was reported that during the current session the Society had been able to secure the insertion of satisfactory clauses in upwards of thirty Railway, Water, and other Bills, with the result that over 2,000 acres of common land had been saved from absorption. The committee resolved to strenuously oppose the Swansea Corporation Bill, now before the House of Lords, on the ground that it involves an evasion of the Commons Acts, since, under it, the Corporation seek power to utilise for building and other purposes 48 acres of commonable lands known as Graig-Trewyddfa, situate in the borough. The proposed purchase as a park of a tract of forest land, 859 acres in extent, formerly part of Hainault Forest, Essex, and lying in the parishes of Lambourne and Chigwell, was further considered. Mr. E. N. Buxton stated that applications for grants were before the Essex County Council, the City Corporation, the Woodford Urban District Council, the Romford Urban District Council, and other Local Authorities. Seven thousand five hundred pounds had already been promised or received out of the minimum sum of 27,000*l.* which was needed to complete the scheme. A vote of thanks to Mr. Buxton for his efforts in the matter was accorded on the motion of Lord Thring, and it was determined to issue an appeal to members of the society and others for aid in carrying out, as a permanent memorial of the Coronation, a scheme which the Committee unanimously felt was deserving of the assistance of all open space supporters. It was pointed out that the land is within twelve miles of the Bank of England, and that it is offered to the public at a far cheaper rate than that paid for any other metropolitan open space. The Secretary stated that considerable indignation had arisen owing to the fact that seven alleged public rights of way in the parishes of Hoo, Friendsbury, and Cobling, Kent, had been obstructed on land owned by the Admiralty. The Society resolved to co-operate with the Local Authorities in obtaining the removal of the obstructions in the event of sufficient evidence as to the public nature of the paths being forthcoming.

It was also determined to assist in securing the protection of rights of way at Leagrave (Beds), Saddleworth (Yorks), and elsewhere. Approval was given to a petition from the society to the House of Commons, praying to be heard by counsel against amendments being allowed to the New Forest (Sale of Lands for Public Purposes) Bill. As its suggestions had been adopted in framing the Bill, the society had informed the Government that while it would not object to the Bill in its present form, it would vigorously oppose any proposal for the extension of power authorising the alienation of Forest Lands. It was resolved to co-operate with the Metropolitan Public Gardens Association and the other Open Space Societies in taking such steps as may be necessary to secure the better protection of Disused Burial Grounds.

BOOKS RECEIVED.

PAINTING AND DECORATING. By Walter Pearce. (C. Griffin & Co.)

CONGRESS OF FRENCH ARCHITECTS.—We defer our report of the Paris Architectural Congress till next week, not having space for the whole in this week's issue.

FIRE IN CHATHAM DOCKYARD.—A destructive fire occurred in Chatham Dockyard on the 6th inst., and before the outbreak was extinguished the mould loft, together with the valuable contents, was practically destroyed. The floor of the loft, on which the full-sized section of every ship built in the yard was "laid-off," was nearly 300 ft. in length by 68 ft. in width, and at each end there were large offices affording accommodation for a staff of 150. Apart from the burning of the building, a very serious loss is involved in the destruction of the whole of the valuable plans of the latest types of battleships and cruisers, together with nearly the whole of the records for many years past.

THE PARISH CHURCH, NORTHORPE, KIRTON-IN-LINDSEY.—The Ecclesiastical Commissioners have undertaken to carry out, at an estimated cost of nearly 400*l.*, the repair of the chancel of the parish church of St. John the Baptist, Northorpe, Lincolnshire, of which the general fabric has fallen into a dilapidated condition. In a report made by Mr. Hodgson Fowler, it is calculated that a further sum of 1,000*l.* should be expended upon the rest of the structure, and an appeal is made for contributions to that amount. The arcades and a doorway in the chancel are of the eleventh century period, the clearstory, the embattled western tower, and the east window are in the Perpendicular style. The south door is distinguished by some beautiful scroll wood-carving with a border of foliage, which, it is believed, was executed in or about 1370, and the church presents many interesting features that illustrate successive changes of style in architecture.

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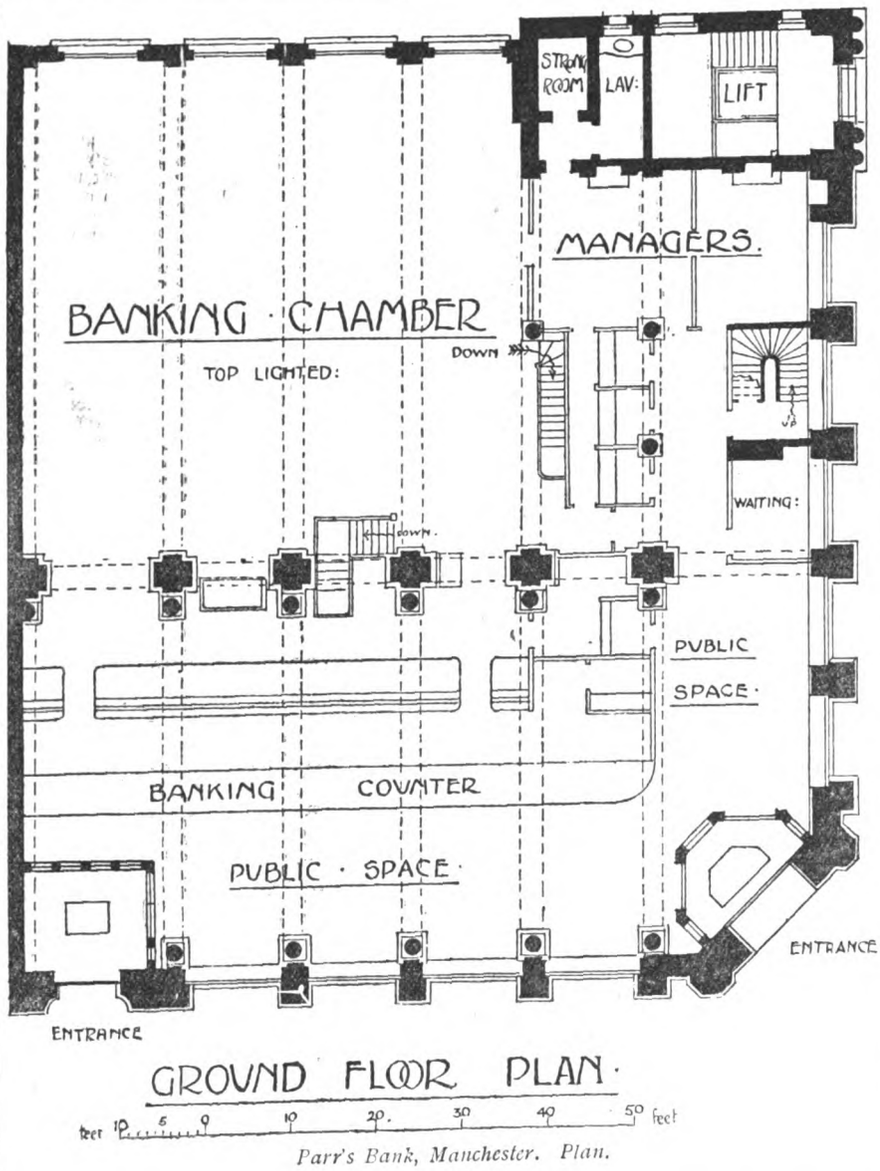

Parr's Bank, Manchester. Plan.

Illustrations.

PARR'S BANK, MANCHESTER.

THIS bank is in course of erection on a site in Spring-gardens and York-street The whole of the ground floor, 25 ft. in height, is occupied by the Banking Company. This chamber is roofed in with a large domed top-light. The whole of the banking portion is lined with Spanish, French, and Italian marbles, large detached monolith columns of "ground antique" marble forming special features. The large windows to the ground floor are made of bronze framing. The upper floors of the building are arranged for offices for letting purposes.

The exterior is built of red stone, with the exception of a polished grey granite plinth and a main entrance of unpolished granite. A dome surmounts the roof at the corner; this and the lantern above it are covered with copper. The whole of the basement is used by the bank, large strong-room accommodation being provided.

The builders are Messrs. Neill & Sons, Manchester, and the architects Messrs. Charles Heathcote & Sons, Manchester.

HOUSE, WEST GREEN, WINCHFIELD.

THESE two drawings of one of Mr. Ernest Newton's characteristically quiet but picturesque dwelling-houses are exhibited at present at the Royal Academy.

The plan (see p 593) shows both the general arrangement of the rooms, and also that of the immediate surroundings of the house, but not the aspect; we have great difficulty in persuading architects to put a north point on their plans, though aspect is so essential an element (or shou'd be) in house-planning.

PUBLIC LIBRARY, KINGSTON-ON-THAMES.

THIS design, by Mr. A. Cox, was placed first in the recent limited competition, by the assessor, Mr. Basil Champneys.

The conditions required that the principal entrance should be in the Fairfield-road, and a separate entrance for boys in the Fairfield West. Supervision from the staff enclosure in the lending library, and a general directness of approach to the various public rooms, were also required. Skylights were to be avoided as much as possible, and the rooms treated as small halls sufficiently lofty to take galleries to be erected at some future time.

A residence for the librarian was also to be provided. Owing to the site being isolated, the four elevations had to be of equally good character, and although future extension was asked for, the present building was to be complete in itself.

The estimated cost is 6,000*l.*

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE following applications as reported upon by the Building Act Committee were dealt with at Tuesday's meeting of the London County Council. Unless otherwise stated consent was given. The name of the applicant appears between parentheses :—

Deptford.—Rescission of resolution of the Council of December 17, 1901, sanctioning the retention of a wood and glass covered way and greenhouse at the side of No. 39, Lewisham High-road, New Cross.

Islington, West.—Permitting the retention of certain structures upon the west side of Paradise-passage, Islington.

Clapham.—Variation of resolution of the Council of February 18, 1902, sanctioning the erection of a detached house on the north side of Poynder's-road, Clapham, by the addition after the words "not to erect any building" of the words "other than such structures to be used for gardening purposes, as the Council may from time to time approve."

Lewisham.—Variation of resolution of the Council of April 22, 1902, sanctioning the erection of a wood and glass porch at the entrance to the Swiss Cottage public-house, Stanstead-road, Forest Hill, by the omission of the words "that the whole of the exposed wood work be constructed in oak, teak, walnut, or mahogany."

Lines of Frontage and Projections.

Lewisham.—Two wood and slate pents at the front and side entrances respectively of a dwelling-house on the north side of Codrington Hill, Lewisham, at the corner of an unnamed street leading to Brockley rise, April 3, 1902 (Mr. J. Taylor).

Woolwich.—Two-story additions in front of a house known as The Cedars, and of Nos. 1 and 2, Rose Cottages, Station-road, Abbey-wood, Plumstead (Mr. A. W. Martin for Mr. A. Martin).

Chelsea.—A theatre building on the northern side of King's-road, Chelsea, at the corner of Sydney-street (Messrs. Wylson & Long).

Greenwich.—One-story shops on part of the forecourts of Nos. 76 and 78, London-street, Greenwich, to the line shown upon the plan dated April 19 (Mr. C. Reilly on behalf of the Worshipful Company of Drapers).

Hampstead.—A three-story bay-window at No. 31, Steele's-road, Hampstead (Mr. C. J. Strachan).

Hampstead.—A timber-framed porch at the entrance to a house to be known as "Wadham Lodge," in course of erection on the north side of Wadham-gardens, Hampstead (Mr. A. F. Faulkner).

Hampstead.—Two bay-windows in front of a dwelling house, to be known as "Wadham Lodge," in course of erection on the north side of Wadham-gardens, Hampstead (Mr. A. F. Faulkner).

Lambeth, North.—Wood and tile pents over the entrances to three dwelling-houses on the south side of Ufford-street, Lambeth, at the corner of Webber-street (Messrs. Clutton on behalf of the Ecclesiastical Commissioners).

Norwood.—An addition to the Norwood Technical Institute, Knight's Hill-road, West Norwood, to abut upon Chapel-road (Mr. P. L. Waterhouse).

Paddington, South.—An iron and glass shelter on part of the forecourt of No. 7, Bayswater-hill, Paddington (Messrs. Peirson & Co. on behalf of Mr. W. P. Bullivant).

Southwark, West.—The retention of a one-story transformer chamber on the forecourt of No. 91, Blackfriars-road, Southwark (London Electric Supply Corporation, Limited).

Finsbury, East.—An iron and glass shelter in front of the porch at the entrance to Cocker's Hotel, Nos. 18 to 21, Charterhouse-square, Finsbury (Mr. E. Haslehurst).—Refusal.

Greenwich.—Two houses on the western side of St. John's Park-road, Blackheath (Mr. A. Levett).—Refusal.

Kensington, South.—An iron and glass covered way at the entrance to Bolton Mansions Hotel No. 13, Bolton-gardens West, Old Brompton-road, Kensington (Messrs. Harrods, Limited).—Refusal.

Lewisham.—One-story shops on the forecourts of, 4 and 6, Ravensbourne-road, Catford (Mr. G. B. Gillard).—Refusal.

Paddington, North.—A one-story shop on the forecourt of 5, High-road, Kilburn (Mrs. P. Hoc).—Refusal.

St. George, Hanover-square—A stone balcony at the first-floor level in front of No. 11, Clarges-street, Piccadilly (Mr. M. E. Collins).—Refusal.

St. George, Hanover-square.—An iron and glass verandah over the portico at the entrance to No. 46, Eaton-square, St. George, Hanover-square (Messrs. R. Slaughter & Sons on behalf of Lieut.-Colonel E. Tufnell, M.P.).—Refusal.

Whitechapel.—A projecting pier and shop front and of a two-story oriel window in front of No. 61, High-street, Whitechapel (Messrs. N. S. Joseph & Son & Smithem).—Refusal.

Width of Way.

Bethnal Green, North-East.—Two two-story cottages on the north side of Globe-passage, Pritchard's-road, Bethnal Green, with the external walls of such cottages at less than the prescribed distance from the centre of the roadway of the street (Mr. J. H. T. Keeves).

Rotherhithe.—A cottage building in connexion with the new Congregational church and schools, Queen Elizabeth-street, Bermondsey, with the external walls of such building at less than the prescribed distance from the centre of the roadway of Boss-street (Mr. J. Wills).

Rotherhithe.—A two-story building on the west side of New Church-street, Rotherhithe, at the corner of Channel-row, with the external walls of such building at less than the prescribed distance from the respective centres of the roadways of those streets (Mr. F. G. Peskett).—Refusal.

Rotherhithe.—A building at No. 670, Rotherhithe-street, Rotherhithe, with the external walls at less than the prescribed distance from the centre of the roadway of the street (Mr. C. H. Flack).—Refusal.

Space at Rear.

Norwood.—The retention and completion of five coach-houses and stables at the rear of the buildings

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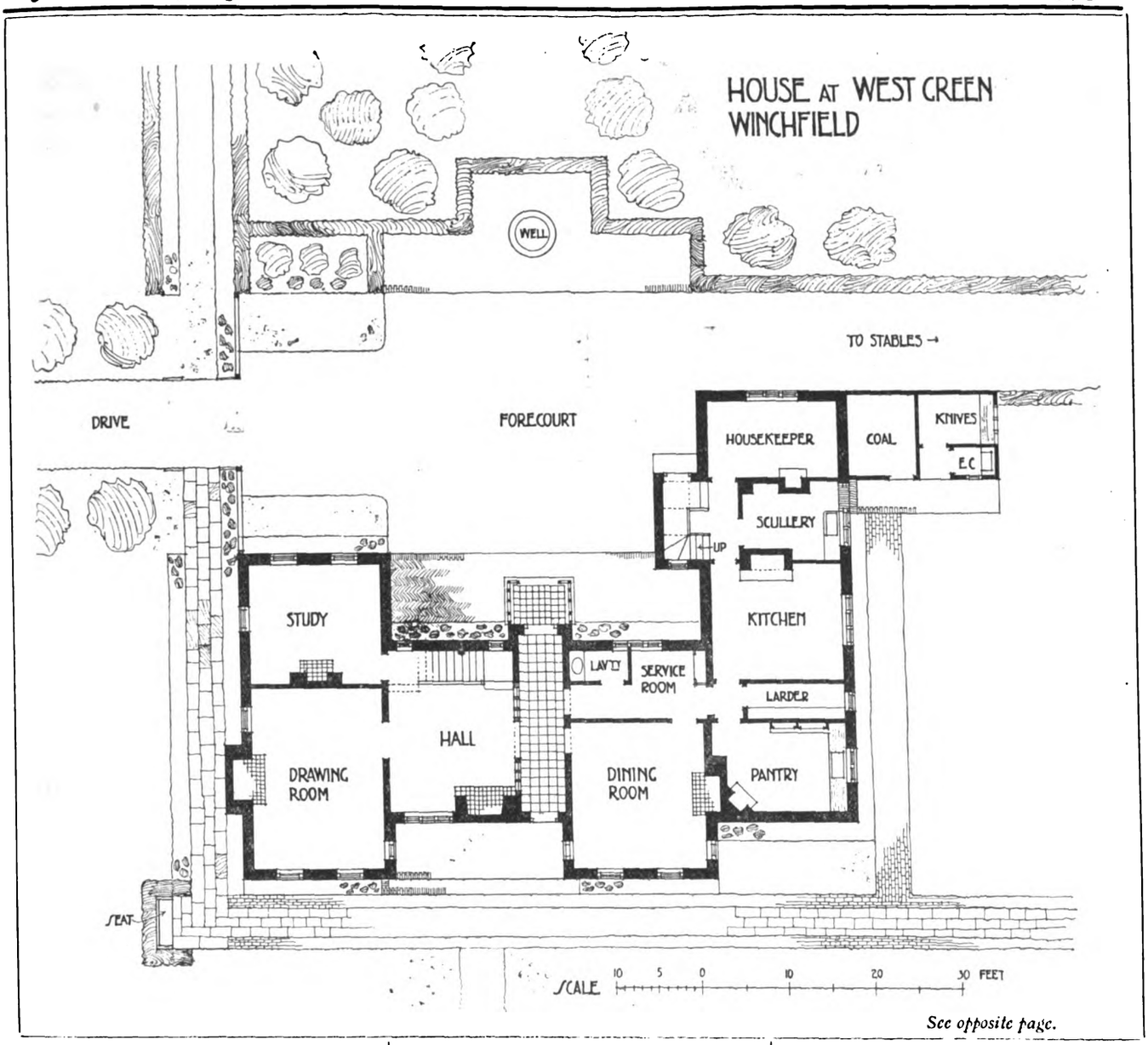

See opposite page.

on the west side of Knight's-hill-road, Norwood, northward of Thornlaw-road, such coach-houses and stables being without an open space at the rear (Mr. H. Bignold).

Width of Way, Line of Frontage and Projections.

Marylebone, West.—A one-story oriel-window at the ground floor level at the rear of No. 53, Montagu-square, St. Marylebone, to abut upon Montagu-mews West (Messrs. Hudson & Hunt).

Paddington, South.—A one-story building in the area to No. 8, Gloucester-square, Paddington, with the external walls at less than the prescribed distance from the centre of the roadway of the street (Mr. R. S. Buckeridge).—Refusal.

Formation of Streets.

Dulwich.—A new street for carriage traffic, to lead from Lytcott-grove to Colwell-road, East Dulwich (Mr. G. Bransom, and that the name Playfield-crescent be approved for the new street.

Lewisham.—Two new streets for carriage traffic to lead from Perry-rise to Wynell-road, Lewisham (the Worshipful Company of Leather Sellers).—Refusal.

Norwood.—Three new streets for carriage traffic to lead from Elmwood-road to Herne-hill, Dulwich (Mr. H. G. Smallman).—Refusal.

Line of Frontage, Cubical Extent and Omission of Concrete over Site.

Fulham.—The erection at the Fulham Steel Works, on the south-east side of Townmead-road, Fulham, of two girder and boiler shops, without a layer of concrete over the site and each to exceed 250,000 but not 450,000 cubic ft. in extent, and also the erection of a template shop to an advanced line of frontage (Messrs. Mayoh & Haley).

Buildings for the Supply of Electricity.

St. Pancras, East.—An addition to the generating station and works on the north side of Pratt-street, St. Pancras, and also in accordance with Section 203, the erection of such addition as shown upon the plans.

Cubical Extent, Construction of Building, and Omission of Concrete over Site.

Poplar.—A one-story brick and iron boiler shop, at London-yard, Manchester-road, Poplar, without a layer of concrete over the site (Sir W. Arrol & Co., Ltd.)

Dwelling-houses on Low-lying Land.

Camberwell, North.—Two buildings on low-lying land situate on the north side of Notley-street, Camberwell (Mr. H. L. Upshaw) the licence to contain the following conditions:—(1) that the site of the building be covered with a layer of Portland cement concrete; (2) that the level of the lowest floors be not less than +8·75 Ordnance datum, as shown on the plan which accompanied the application (3) that no basements be constructed; (4) that the details of the drainage be approved (if not already sanctioned) by the Borough Council before the erection of the buildings is commenced; (5) that the responsibility for floodings rest with the owner of the houses; (6) that if the said application or plan be hereafter found to be incorrect in any particular, the said licence shall be null and void.

Woolwich.—To convert into six shops four houses known as "The Cedars," Wood-villa, and Nos. 1 & 2, Rose Cottages, Station-road, Abbey Wood (Mr. A. W. Martin) the licence to contain the following conditions—that the level of the shop floors be +9·58 Ordnance datum, and that of the floors of the back additions + 8·50; that the level of the shop floors and of the floors of the back additions of the premises known as Nos. 1 & 2, Rose cottages, be + 8·50 Ordnance datum; that the levels of all connexions with the house drains, such as closets, sinks, gullies and rainwater-down-pipes be kept up to + 8·50 Ordnance datum; that no basements be constructed; that a layer of Portland cement concrete, 6 in. in depth, be placed over the site.

Residential Flats at Hampstead.

Hampstead.—That the resolution of December 10, sanctioning to the erection of four blocks of residential flats and the formation of a carriage-drive on the west side of West-end-lane, Hampstead, be varied by the omission of condition (*a*) which prohibits the erection of gates, and of the words "except as regards the erection of gates" in line 24.

Lines of Frontage and Projections.

Strand.—Wood and glass inclosure at the sides of a porch at the entrance to No. 11, St. James's-square, St. James's (Messrs G. Trollope & Sons).

Hammersmith.—An extension of the periods within which the erection of an addition to No. 180, King-street West, Hammersmith, to abut upon Dallihg-road, was required to be commenced and completed, from November 1, 1898, that the addition for a distance of 36 ft. from No. 180, King-street, be completed to a height of two stories above the ground level, and the whole of the land coloured blue upon the approved plan be dedicated to and left open for the use of the public during the year 1902; that the whole of the addition be completed within eight years from November 1, 1898.

Battersea.†—A one-story addition at the rear of No. 80, St. John's-road, Battersea, to abut upon Aliewal-road (Mr. W. H. Boney).

Holborn.—Two projecting wooden hoods over the entrances to No. 47, Bedford-row, Holborn (Mr. H. M. Wakley).

Lewisham.—Two houses, with one-story shops in front, on the site of Gloucester House, on the east side of Rushey Green, Catford (Messrs. Norfolk & Prior).

St. George, Hanover-square.—The retention of two projecting shop fronts at Nos. 38 and 39, South Molton-street, St. George, Hanover-square (Mr R. M. Roe).

St. George, Hanover-square.—To retain a projecting sign in front of 7, Wood's-mews, Park-lane, St. George, Hanover-square, extending beyond the general line of buildings in the street.

Woolwich.—An extension of the periods within which the erection of eighteen houses on the north side of Bexley-road, Eltham, eastward of Eldersle-road, was required to be commenced and completed.

Wandsworth.—Buildings, with shops on the ground floor, on the east side of Balham High-road, and of the erection of buildings with projecting one-story shops on the west side of Bedford Hill-road Balham (Mr. P. P. Taylor).

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Marylebone, East.—Retention of an entrance doorway at the angle of premises known as Nos. 328 and 330, Oxford-street, and Nos. 1 and 2, Vere-street, St. Marylebone (Mr. J. Macvicar Anderson).

Lewisham.—A house on the west side of Perry-rise, Lewisham, to abut upon Queenswood-road (Messrs. Eastman Bros.).—Refusal.

St. George, Hanover-square.—Three oriel windows, at the first, second, and third floor levels, in front of No. 5, Stafford-street, Westminster (Messrs. J. T. Wimperis & Arber).—Refusal.

Width of Way.

Greenwich.—Two-story cottages on the north side of Trevithick-street, Watergate-street, Deptford, with the external walls of such buildings at less than the prescribed distance from the centre of the roadway of the street (Mr. D. Young).

City.—Re-building of Nos. 166, 167, & 168, Fleet-street, City, with the external walls of the new building at less than the prescribed distance from the centre of the roadway of Johnson's-court (Messrs. Still, Wheat, & Luker).

Camberwell, North.—Retention of a one-story building at the rear of No. 119, Camberwell-road, Camberwell, with the forecourt boundary at less than the prescribed distance from the centre of the roadway of Goodyear-place (Mr. W. Simmonds).

Rotherhithe.—Three houses on the south-east side of Manor-lane, Rotherhithe, with the forecourt boundary at less than the prescribed distance from the centre of the roadway of the street (Messrs. Stock, Page, & Stock).

Limehouse.—Permission to retain a one-story stable building on the south side of Ropemaker's-fields, Limehouse, at the corner of Thomas-rents with the external wall of such stable at less than the prescribed distance from the respective centres of the roadways of Ropemaker's-fields and Thomas-rents.—Refusal.

Space at Rear.

Islington, East.—Deviations from the plan certified by the District Surveyor, under such section of the Act, so far as relates to the proposed rebuilding of the Hen and Chickens public-house, and Nos. 128 and 130, Canonbury-road, Islington (Mr. W. A. Aickman).

Lambeth, North.—Deviations from the plan certified by the District Surveyor, under such section of the Act, so far as relates to the proposed re-building of No. 1, Gloucester-street, Lambeth, at the corner of Kinaston-place (Mr. J. W. Jacomb Hood).

Lewisham.—A modification of the provisions of Section 41 (1) (vi.) with regard to open spaces about buildings, so far as relates to the proposed erection of two dwelling-houses on the west side of Porthcawe road, Lewisham, northward of No. 36, with an irregular open space at the rear (Mr. W. R. Quested).

Wandsworth.—A modification of the provisions of Part V. of the London Building Act, 1894, as to the extension above the diagonal line directed by Section 41 of that Act to be drawn so far as relates to the proposed erection of additions at the rear of No. 59, Balham High-road (Messrs. Hovenden & Barber).—Refusal.

Width of Way and Lines of Frontage.

Camberwell, North.—A mission church and hall on the site of 45, 47, and 49, Brisbane-street, Camberwell, with the external walls and boundary fence at less than the prescribed distance from the centre of the roadway of Brisbane-street (Mr. R. J. Lovell).

Paddington North †—A block of residential flats, with one-story shops in front, on the site of Nos. 212 to 220 (even numbers only, inclusive), Harrow-road, Paddington, with the external walls at less than the prescribed distance from the respective centres of the roadway of Westbury-road and Ranelagh-road (Messrs. Palgrave & Co.).—Refusal.

Width of Way and Construction.

Paddington, South.—An external iron staircase and landing in front of No. 7, Polygon-mews South, Porchester-place, Edgware-road, Padddington, at less than the prescribed distance from the centre of the roadway of the street (Mr. T. Shaw).—Refusal.

Wandsworth.—The formation or laying out of two new streets for carriage traffic on the Chadwick House Estate, Balham High-road (Mr. R. H. Miller).

Greenwich.—The formation or laying out of a new street for carriage traffic, to lead from Church-lane to Lansdowne-road, Charlton (Mr. E. E. Wood).—Refusal.

Lewisham.—The formation or laying out of new streets for carriage traffic on the east side of Crofton-park-road, Lewisham (Mr. J. W. Webb).—Refusal.

Buildings for the Supply of Electricity.

Lambeth, North.—The construction of two ventilating shafts at the generating-station, No. 85, Commercial-road, Lambeth (Mr. W. B. Pinhey).

Fulham.—A two-story addition, to be used as a rectifier building, on the south-west side of the engine-room at the generating station on the east side of Townmead-road, Fulham (Mr. F. G. Minter). Refusal.

Means of Escape from the Top of High Buildings.

Strand.—On the fifth floor of Nos. 45 and 46, Leicester-square, Soho (the upper surface of which floor is above 60 ft. from the street level) for the persons dwelling or employed therein (Messrs. Wimperis & East).

Cubical Extent.

Woolwich.—The alteration of a building on the west side of Henley-road, North Woolwich, such building exceeding in extent 250,000, but not 450,000 cubic feet, and being used only for the purposes of the manufacture of telephone cables (Messrs. Ardron & Dawson).

*** *The recommendations marked † are contrary to the views of the local authorities.*

Correspondence.

QUEEN VICTORIA-STREET FIRE.

SIR,—The sad loss of life at the General Electric Co.'s premises in Queen Victoria-street claims public attention in more than an ordinary manner.

It is notorious that many office and warehouse buildings must necessarily be used temporarily for manufacturing purposes, and that individual rooms or floors have frequently to serve as workshops.

Legislation, as it stands to-day, gives the public authorities considerable control over specific classes of buildings erected for specific purposes, but there is little or no control exercised as to the use of buildings or parts of buildings for purposes other than those for which they were originally intended. It is in such buildings that the congregation of a large number of workers becomes exceedingly perilous and the sad loss of life on this and other occasions only too clearly shows the absolute necessity for greater severity in controlling the use to which such buildings are put.

The serious loss of life on this occasion, following so shortly upon a series of deaths in buildings partially used as business premises and partially used as tenements (we should here particularly refer to the fires at Hackney and St. Lukes), makes it evident that revision in the interest of human safety is required in more than one direction, *i.e.*, especially in shops with dwellings above. Combined with this we have a number of large fires in which there has been no loss of life but in which a vast quantity of property has been destroyed, as, for instance, in the Cripplegate and the Barbican, and the Dock centres.

Our committee wish to urge most emphatically that fire preventive legislation requires revision, and that to make it effective, it must be of a retrospective character.

At the same time we should like to point out the personal responsibility which rests with the owners of the building and the employer of labour in seeing to the safety of the staff, and that this responsibility should be recognised and clearly defined by law.

It is not the intention of the committee at short notice to define what are the reasonable requirements to limit loss of life, but it is the opinion of the committee that a ready and easy means of escape should be provided from the upper part of *every* building, in the County of London, both new and old.—On behalf of Fire Prevention Committee,

EDWIN O. SACHS, Chairman.
ELLIS MARSLAND, Hon. Secretary.

THE DORMITORY, WESTMINSTER SCHOOL.

SIR,—In his highly interesting Report published in your number of June 7, Mr. Stratton says :—

"A dormitory . . . . once stood upon or near to the site of the present building. Of this nothing remains. Nor have we been able to find any trace of it or reference to it, except in certain entries of the Chapter House records."

The old dormitory, known as the "Long Room," stood on the green in Dean's-yard, formerly called "The Elms." It had been the monks' granary—a long, fourteenth-century, building, supported by arches, and having a large tower, afterwards the under-master's house. The adjacent bakehouse, brewhouse, the ox-stall, and the barn near the mill-dam (Great College-street) completed the group. The granary was taken for the school dormitory during the deanship (1560-1) of Bill, who furnished it for the scholars' use, or that of his successor, Goodman 1561-1601), who established the school sanatorium at Chiswick. Several views may be seen in the Crace collection and at the Guildhall Library, amongst them being Basire's engraving, after J. Carter, which shows also part of the crypt and the tower as in 1758, another drawing by Carter, an engraving by W. Angus, after W. Courtenay, 1760, and others.

If Bath stone was adopted (1720) for the later building, we there have an early instance of the employment in London of that stone, which, it is said, was first used (in London) by Gibbs for the great quadrangle of St. Bartholomew's Hospital, begun in June, 1730, and refaced by Hardwick.

D-M.

SYMBOLISM OF CHURCH ORNAMENTS.

SIR,—I have read with much interest your report of the discussion on "The Origin and Symbolism of Church Ornaments," in last week's *Builder*. Much of the argument seems to be based on a text of scripture not quoted—"Howbeit, that was not first which is spiritual, but that which is natural; and *afterward* that which is spiritual."

In further reply to a question of the Rev. E. W. Hines, I may say that in the parish church of St. Mary, Moulsoe, Bucks, is a reredos of mine (still far from complete) of oak, in the central portion of which is a carved figure of our Lord as priest "reigning from the tree," robed and crowned; carved under my direction by Mr. N. Hitch, of Vauxhall. The example at Bathwick quoted was, I believe, that which led my client to adopt the subject for his own church. Examples of it abroad are far from uncommon, and, if my memory serves me aright, there is, or was, an early one of Byzantine character, of great beauty, in St. Sernin, at Toulouse.

E. SWINFEN HARRIS, F.R.I.B.A.

HOLBORN BATHS.

SIR,—In your notice of the new Holborn Baths on page 567 of the last number of the *Builder* you mention, with disapproval, "the dark mass formed by the fronts of the dressing boxes" Everyone (including Messrs. Clarkson, the architects) will, we are sure, agree with your remarks, but we should like to be allowed to point out that the dark mass will be "light and bright toned" in a little time.

The Japanese lacquer, used for the dressing boxes at the Holborn Baths, and now being largely used elsewhere, has very peculiar properties.

The last of the three coats put on at Holborn left the woodwork quite black, almost as if ebonised; and you saw some of it in that state on the opening day.

Already the blackness has gone off largely, as the result of the influence of light. If you (or any of your readers interested in the matter) will look at the lacquer at Holborn after a month has elapsed you will find the result a bright-toned light red. The lacquer will not change again much after that, and any change in it will be in the direction of brightness.

RHUS & Co.

The Student's Column.

PART III.—PRIVATE SEWAGE DISPOSAL.

CHAPTER 23.—DISPOSAL ON LAND (*continued*).

SUB-IRRIGATION.—This method of disposal may be regarded as a modified form of broad irrigation. The principal feature is the discharge of the sewage a few inches below the surface of the ground instead of over the surface. The advantage of this arrangement is that the sewage is not exposed to view; ponding is also avoided, and a nuisance is not so easily created. On the other hand, the sewage is not likely to be so thoroughly purified, as bacterial activity decreases from the surface of the soil downwards.

The system was originally devised by the Rev. J. M. Moule—better known as the inventor of an earth-closet—but was improved by the late Mr. Rogers Field, who adopted it for the sewage of schools and other buildings. It has also been adopted in America by the late Colonel G. E. Waring and others.

The sewage should first pass through a settling tank, in which the heavy solids are deposited, and the coarse matters (such as paper and straw) retained. A certain amount of grease will also be collected in the floating scum. From this chamber the sewage passes into a larger tank, where it is stored for a period varying from twelve to twenty-four hours, or even longer. Unless the sewage must be pumped to a higher level, an automatic siphon may be fixed to come into action when the tank is full and to discharge the sewage into the main drain leading to the irrigation areas. Fig. 95 shows a pair of tanks, differing only in detail from the

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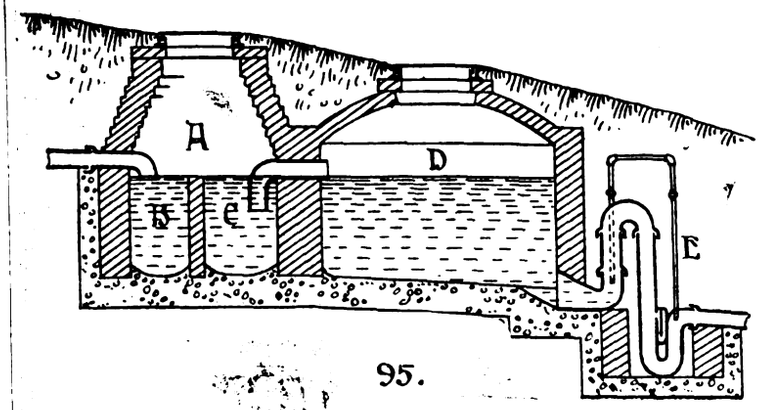

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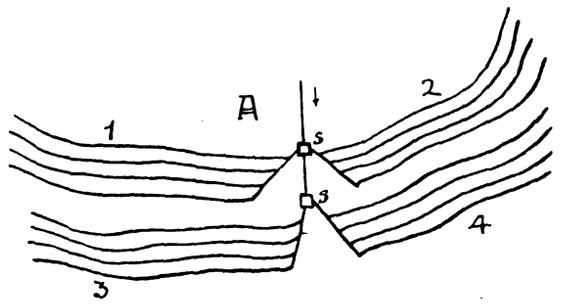

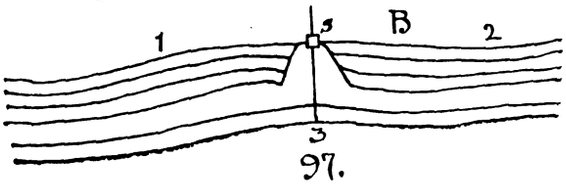

97.

Illustrations to Student's Column.

arrangement recommended by Colonel Waring. The inlet to the settling-chamber A dips slightly below the level of the overflow, so that the sewage is diverted downwards; deep trapping may lead to the accumulation of grease at the mouth of the drain. A screen wall divides the settling-chamber into two parts, B and C, the first of which retains the heavy solids, while the second serves as a scum-chamber for the collection of grease, &c. The overflow dips deeply into the second chamber, so that the scum is not carried forward into the storage-tank D. An automatic siphon E comes into action when the sewage reaches a certain level, and continues in action until nearly all the contents are discharged. The siphon is sometimes placed within the tank, but in this position it becomes foul. In the illustration it is shown outside the tank, but it may with advantage be placed in a manhole so as to be easily accessible for repairs.

The size of the main tank will depend upon the amount of the sewage and the desired interval between the discharges. It cannot be too often insisted upon that rainwater should be excluded as much as possible from the sewage-drains when a private system of purification has to be adopted.

The sludge and scum accumulating in the settling chamber must be removed when necessary, and can be most conveniently got rid of by digging it into cultivated land. The sedimentation of the sewage in tanks is essential to the success of sub-irrigation, as otherwise the absorption drains are soon choked with sludge.

The arrangement of tanks shown in the illustration is not the best. Undoubtedly bacteria will be at work breaking up the sewage, but the tanks are not proportioned in such a manner as to give thoroughly satisfactory results. The first tank B is really a grit chamber. The second compartment is of the nature of a septic tank with a continuous flow through it, but its capacity is too small to allow great changes to take place in the sewage. These changes will however, be continued during the filling of the large tank, but it is obvious that the last portions of the sewage to enter the tank will be discharged by the siphon in the state in which they leave the scum-chamber C. This subject will be more fully discussed in a later chapter.

Open tanks are sometimes used, but ought to be covered with iron grates or screens to prevent leaves from entering the tanks and passing to the absorption-drains.

From the discharging tank D the sewage passes along the outfall drain to the sub-irrigation areas, of which at least three ought to be provided. These areas must be well dug over to a depth of ten or twelve inches or more, and carefully graded. At a depth of nine or ten inches from the surface, earthenware channels (fig. 96) must be laid with open joints and a very slight fall (say, 1 in 400 to 1 in 600); on these channels, agricultural drain-pipes, 2 in. in diameter and in 1-ft. lengths, are laid with the joints open about a quarter of an inch. Above the joints, small segmental caps (with a larger radius than the exterior of the pipes) are placed to prevent the soil falling through the joints, while still allowing the sewage to escape. If a greater fall than 1 in 400 is given to the absorption-drains the sewage will accumulate at the ends of the drains, and may burst through to the surface of the ground.

The absorption drains may be laid from 3 ft. to 6 ft. apart. The total length in each area must be regulated by the amount of discharge from the tank and the nature of the soil. Colonel Waring recommends 1 ft. of 2-in. absorption-drain for each gallon of sewage discharged, if the soil is reasonably porous, and at least 3 ft. if the ground is impervious clay. Rather more than 7 ft. of 2-in. pipe will be required to contain a gallon, but the sewage, of course, escapes through the open joints of the drains into the channels and grounds during the period of discharge, and consequently a lower basis of calculation may be adopted. The sewage ought not to enter the absorption-drains at a high velocity; to prevent this the last 20 ft. or 30 ft. of the main drain from the tank may be laid with a fall of about 1 in 300. The absorption-drains must, of course, have their inverts level with the inverts of the mains.

The irrigation areas may be arranged in a variety of ways, according to the configuration of the ground. Two methods are shown in fig. 97, that at A having four areas and that at B having three. The sewage can be diverted at the points marked *s* into the different groups of absorption-drains. The areas must be irrigated in turn, so to admit of one discharge in any area being absorbed and purified, and the ground well aërated before another dose is applied. A longer rest may be given to each area as required, by applying the sewage alternately to the other areas. Rows of vegetables may be planted between the drains, and the sewage will be to a large extent absorbed by their roots, or grass may be grown over the whole area.

If the drains become choked with sludge, a period of rest must be allowed, when a great part of the sludge will disappear through the action of bacteria and other organic life. In some cases, however, it will be necessary to take up the pipes, and relay them after removing the deposits. This is not a very laborious operation, as the pipes are so near the surface.

At the Lawrenceville School for Boys, New Jersey, sub-irrigation was adopted for the sewage, the rainwater being excluded from the sewage-drains. The scheme was designed for the sewage from 400 persons, and a large tank was constructed and divided longitudinally into six compartments. Three compartments were used at a time, the sewage travelling slowly forward in the first compartment, overflowing by a dipped pipe to the second, flowing back along this and overflowing to the third, and then passing along to the overflow into the discharge tank. Each compartment is 60 ft. long, about 3 ft. wide, and 4 ft. deep. The discharge tank is 25 ft. in diameter and 8 ft. deep, and from this it was intended to pump the sewage about twice a week into the irrigation areas. These consisted of 1¾ acres of ground, in which about 600 ft. of 4-in. main pipes and 20,000 ft. of 2-in. absorption drains were laid. The latter were about 8 in. below the surface and 5 ft. apart, and had an inclination of 1 in 100 to 1 in 130. In practice this inclination was found to be excessive. The scheme appears to have worked well for some time, but the irrigation area proved inadequate after some years, during which the flow of sewage gradually increased from 6,000 to 20,000 gallons a day. It must be said that the ground was not of a suitable character. On account of the proximity of a brook the underdrains were laid at an average depth of about 3 ft. only, and in some places were only 2 ft. deep. The ground was of a porous nature, and much of the sewage therefore passed directly to the underdrains, very little purification being effected.

Sub-irrigation has never been adopted on a large scale in this country, but it has proved useful for private sewage-disposal where the irrigated areas are near buildings.

Intermittent Downward Filtration.

This method of disposal, brought into prominance by Mr. Bailey Denton, has been very widely adopted in this country, sometimes successfully and sometimes not. If the ground is of a porous character, and in such a situation that it can be underdrained at a depth of 5 or 6 ft., good results will be obtained under careful management. If, however, the ground consists largely of clay, or if the underdrains cannot be laid at a greater depth than 3 ft., failure is almost certain to follow.

The different results obtained by this method of land treatment may be conveniently illustrated by means of two examples, of which particulars are given in the recently-issued appendices to vol. iii. of the Interim Report of the Royal Commission on Sewage-disposal. The schemes were designed by one engineer. In both cases the sewage was about 1¼ millions of gallons per day, and included trade refuse as well as domestic sewage. The population in each case was about 30,000. No storage tanks were used. In the one case the sewage was treated on 55 acres of land, and the Inspectors reported the effluents to be unsatisfactory on twenty-six occasions in a period of less than two years, and at no time was the effluent found to be satisfactory. In the other case the farm was laid out as to 61 acres for filtration, and as to 12 acres for broad irrigation. The Inspectors' reports for the same period were—satisfactory, 25; unsatisfactory, 0. The slight difference in the area of the land does not account for the great difference in the amount of purification.

Very similar comparisons might be made between broad irrigation schemes, the fact being that the character of the land vitally affects the results. Careless management may also render even a good scheme unsatisfactory.

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GENERAL BUILDING NEWS.

THE GRANGER PULPIT, GLASGOW CATHEDRAL.—The first step in the furnishing of the nave of Glasgow Cathedral was taken last month when the Granger pulpit, a memorial gift commemorating the late Rev. William Granger, M.A., was placed in position. It consists of an octagonal oak base of open work with traceried panels, on which rests the pulpit proper, also octagonal, ornamented with traceried panels, all of different design and crowned with a carved cope. This is further enriched with a series of carved panels round its base, with shields bearing the symbols of the Twelve Apostles. To the pulpit is fitted a stair with open traceried balusters finished with a pedestal, the carved top of which tells the story of St. Mungo, and also bears the arms of the Church. The style is the Scottish variation of the French Flamboyant, which harmonises well with the rood-screen and other old work in the nave. The pulpit-stair partially encircles the second pillar of the north aisle of the nave. The architect is Mr. P. Macgregor Chalmers, of Glasgow, the joiner Mr. James Grant, and the carver Mr. John Crawford.

NEW CHURCH, HORNINGLOW.—A new church is about to be built at Horninglow, near Burton-upon-Trent, at a cost of from 13,000*l.* to 14,000*l.*, the gift of Lord Burton. The plans and designs will be prepared by, it is stated, Mr. G. F. Bodley.

SCHOOL BUILDINGS, LINLITHGOW.—At a meeting of the Linlithgow School Board, held on the 5th inst., plans for the proposed new elementary school, in place of the Burgh School, which was recently destroyed by fire, were submitted. Mr. William M. Scott, of Linlithgow, was appointed architect. The estimated cost of the building is 5,900*l.*

CHURCH INSTITUTE, LEADGATE, NEWCASTLE-ON-TYNE.—On the 5th inst. the new church institute for the parish of St. Ives, Leadgate, was opened. Its cost is estimated at 1,100*l.* The architect was Mr. J. E. Parker, of Blackhill and Newcastle.

HOSPITAL, EAST BOLDON, SOUTH SHIELDS.—This hospital was opened on the 4th inst. It stands on a site of 5½ acres, about 3 acres of which have been enclosed. The buildings consist of an administrative block, comprising rooms for the use of the medical officer, the matron, and the remainder of the staff, with kitchen and store accommodation. This block is more than sufficient to meet the present requirements, and it has been built with a view to meeting future extensions of the wards. In addition, a caretaker's lodge has been provided in front of the building. The ward block comprises a large ward and a small ward, to admit of classification, and a convalescent room above the nurses' duty-room, bathroom, and lavatory. This ward will accommodate twelve patients, and will generally be used for scarlet fever cases. The isolation block consists of three wards, one of three beds and two wards of one bed each, with duty-room, bathrooms, &c. It is intended for typhoid fever cases, in which classification can also be effected. This block can be duplicated when necessary. The ward blocks are all furnished with glass verandahs in the front, having a south-east aspect, for the use of convalescents. The discharging block comprises a room for undressing on leaving the ward, bathroom, and room for dressing before the patients leave the institution. In the laundry block there is a laundry and ironing-room. The mortuary and ambulance-house are also comprised in this block, and in the rear of the building stables and offices are provided. The flooring of the different buildings has been executed in Terrazzo paving Telephone communication is provided between the various blocks. The whole of the buildings is illuminated by gas. The drainage is carried to a filtration bed at the back of the site. The total cost, including site, erection of buildings, laying out of grounds, making roads, fencing, &c., is about 8,800*l.* The total available accommodation at present is sixteen beds, and these can be increased by duplicating the isolation block and also by the erection of additional wards in front of the existing ward-blocks. The architect was Mr. J. H. Morton, of South Shields. The building contractor was Mr. W. D. Allison, of Whitburn.

CHAPEL, WEST CHEVINGTON, NEWCASTLE-ON-TYNE.—The foundation-stones of a Wesleyan chapel and schools at Red Row, West Chevington, were laid on the 7th inst. The buildings will be erected of local bricks with Accrington red pressed facings, and comprise a chapel, 45 ft. by 27 ft. inside, capable of seating 220 people, and a Sunday school to accommodate 150 children, with two vestries in addition. The seats, rostrum, and other fittings are to be executed in pitch-pine, and the building is to be heated by slow combustion stoves. The builders are Messrs. R. & G Brown, of Amble, and the architect is Mr. J. Walton Taylor, of Newcastle.

NEW BANK BUILDINGS, DOUGLAS, ISLE OF MAN.—New banking premises, forming the chief offices of the Isle of Man Banking Co., in Douglas, are now completed. The site of the building is at the corner of Athol-street and Prospect-hill. The masonry is of light grey granite from Aberdeen. The building is designed in the style of the Italian Renaissance. The length of the façade to Athol-street is 80 ft., and to Prospect-hill 60 ft., and the height of the building, from the pavement at the corner to the top of the granite front, is 55 ft. The first stage of the wall is constructed of large blocks of granite, the jointing being emphasised by bevelled edges. This rustication continues up to the sills of the first-floor windows, where there is a moulded cornice projecting over an enriched frieze. The windows on the ground floor are arched with massive keystones, and each window is surmounted by a square panel of polished granite. Above the ground floor piers or buttresses rise up between the windows for two stories, and are crowned with a cornice. The windows between the piers have curved pediments and polished panels of light rose granite. The façade is further embellished by medallions of polished granite on the face of the piers. The frieze under the main cornice is ornamented by carvings cut out of the granite. The upper finish of the façade consists of balustrading in granite. The entrance to the banking premises is in the corner between the two streets, and consists of a wide doorway with rusticated columns and carved pediment. The ancient arms of the Kings of Man are engraved in polished granite in the centre panel over the pediment. The corner of the building is treated in a circular form above the ground floor, the cornice being supported on four Ionic columns with moulded bases and carved capitals. The entrance door gives access to a circular vestibule paved with black and white marble, and having the walls entirely of polished rose granite. The ceiling is dome-shaped, of richly modelled and decorated plaster. Passing through the vestibule, the banking-hall is reached through mahogany and glass doors. This chamber measures 50 ft. by 38 ft., and is 25 ft. high in the centre. The walls are lined with marble, the architraves and pediments of the doors being of Pavonazza, and the walls of Norwegian marble. Four columns of Pavonazza marble support the central dome, which is of stained glass and modelled plaster-work. Local colour is given to the dome by views of places of interest on the island, and these views are representative of each town in which the bank has a branch. The side walls have eight pilasters of marble opposite the four centre columns. The floor of the banking-hall is of squares of black and white marble. A door in the centre of the banking-hall leads to the directors' room, which faces Athol-street. This room has a ceiling of panelled oak, and there is a high dado, also of oak panels. The manager's room measures 24 ft. by 16 ft., and also faces Athol-street, and has a door from the directors' room as well as from the banking-hall. This room has a high dado of mahogany. The secretary's room is situated at the end of the banking-hall, behind the manager's room, and it has communication with both. The room measures 14 ft. by 12 ft., and is panelled in mahogany. A window of plate glass, let into the wall, affords a complete view of the public office, enabling the secretary, without leaving his room, to supervise the working of the office. The secretary's room communicates with a strong-room. The rooms facing Prospect-hill consist of a waiting-room, stationery-room, and clerk's cloak-room. The basement floor consists of steel-lined strong-rooms, book-safes, and plate-room; also heating-chamber, coal-cellar, and two lavatories and water-closets. This floor is lighted by the plentiful use of prismatic pavement lights from the St. Pancras Ironworks. The warming of the premises is by means of open fireplaces in all the rooms except the banking-hall, which is provided with hot-water radiators. The counters and screens are designed in the Italian Renaissance style, in keeping with the rest of the building. A hydraulic lift connects the banking-hall with the book-safes in the basement floor. The upper floors of the building are arranged as offices, along with a dwelling-house for the bank's caretaker. The entrance to these floors is from Prospect-hill. The builder was Mr. R. F. Douglas, of Brunswick-street, Douglas, assisted by the following firms:—Messrs. Skelly & Caren, masons; Messrs. Christian & Faragher, plasterers; Mr. R W. Creer, marble mason; Messrs. Sherwood & Co., plumbers; Mr. Robert Knox, ironwork; Mr. E. Henry, painter; and Messrs. E. Wade & Sons, ornamental plaster-work. The granite facings were supplied and dressed by Mr. John Morgan, builder, Aberdeen. The glass and leaded lights are by Messrs. Williams & Watson, Liverpool; and the strong-room and safes are by Messrs. Milner, Ltd., Liverpool. The hydraulic lift was furnished by Messrs. Pickering & Sons, Stockton-on-Tees. Mr. A. Marshall Mackenzie, of Aberdeen, was the architect.

NEW PARISH CHURCH, ABERDEEN.—The corner-stone of the new Parish Church for Greyfriars, Aberdeen, which church is to take the place of the pre-Reformation building that has to be removed for the extension of the buildings of Marischal College, was laid on the 7th inst. The new edifice is built of almost pure white granite, and will, when completed, cost 10,000*l.*, which is exclusive of the price paid for the site—another 11,000*l.*—making in all 21,000*l.* A tower, in the English Perpendicular style of architecture, rises to a height of 150 ft. at the west end, and forms the main entrance to the church. Accommodation has been provided for 800, and underneath the church is a number of halls. The transomed window, with its tracery, has been successfully transferred from the old to the new church, and will be filled with stained glass, as will also be the six aisle windows. The architect is Mr. Marshall Mackenzie, of Aberdeen.

CATHEDRAL RESTORATION, CHICHESTER.—The cost of rebuilding the north-west tower was 8,205*l.* 17*s.* 1*d.* The restoration committee have since received 2,000*l.* in answer to another appeal, and have decided that the repair of the campanile shall be the next work undertaken. Mr. Somers Clarke has been appointed consulting architect.

WESLEYAN CHURCH AND SCHOOLS, AMBLE.—The foundation stones of the Red Row Wesleyan Church, Amble, were laid on the 7th inst. A school building will be erected in connexion, and both will be built of local bricks, with Accrington red pressed facings, and comprise a chapel 45 ft. by 27 ft. inside, capable of seating 220 people, and a Sunday School to accommodate 150 children, with two vestries in addition. The seats, rostrum, and other fittings are to be executed in pitch pine, and the building is to be heated by slow combustion stoves. The buildings are to be carried out in a simple treatment of late Gothic architecture, and will cost 1,200*l.*, which, with the site included, will bring the total outlay to 1,300*l.* Messrs. B. and G. Brown, of Amble, are the builders, and Mr. J. Walton Taylor, of Newcastle, the architect

NEW WESLEYAN CHURCH, ERDINGTON, BIRMINGHAM.—On the 4th inst. the new Wesleyan church in Station-road, Erdington, was formally opened. It is built in front of the old one, which will henceforth be used as a school. The design is Early English Gothic, and consists of nave and aisles divided off with granite columns and moulded arches. The present accommodation of the church is for 650 persons, but the intention is ultimately to provide for 850. Provision has been made in the design for the future addition of a tower with spire, together with transepts. The cost of the buildings, inclusive of lighting, warming, and ventilating, is 3,500*l.* Messrs. Ewen Harper & Brother, Birmingham, were the architects.

HOSPITAL, MONIFIETH, DUNDEE, N.B.—This building, now in course of erection, will be built of stone, finished with cement (rough cast) and free-stone dressings. The roof will be covered with red tiling. The interior hospital is on the corridor principle, with an administrative block in the centre. To the east and west of the administrative block are the male and female wards, containing two beds each, with their respective bathrooms and lavatories The building has been so designed that future requirements can easily be met, as, by a re-arrangement, twice the accommodation at present afforded can be obtained. The administrative block is sufficiently large to suit an extended hospital. In addition to the wards, there are on the ground floor the matron's room, operating-room, drug store, and dining-room, while on the first floor there are the matron's, nurses', and servants' bedrooms and bath-room. Kitchen, laundry, and washhouse accommodation are provided at the back, with a small mortuary. The contractors are as follow:—Mason, James Scott, Broughty Ferry; joiner, D. P. How & Son; plumber, David Brown; plasterer, Alexander M'Ritchie; tile work, James Laburn & Sons; glazier, Donald & Smith—all of Dundee. The plans have been prepared by Mr. James Findlay, architect, Albert-square, of that city.

NOTRE DAME TRAINING COLLEGE, LIVERPOOL—The extensions of this building consist of two blocks, one in course of erection, and fronting Mount Pleasant, and which is expected to be finished in about a month; and the other facing Hope-street, the building of which is to be commenced in the early autumn. Both blocks will be used for increasing the accommodation of the Training College. The building facing Mount Pleasant consists of three stories, the main staircase, which will serve the whole of the extension, being placed in the centre of the front. On the ground floor, the space on each side of this staircase will be devoted to a science lecture-room and a music-room; on the first floor, to a series of class-rooms; and on the second floor, to two art-rooms. The corresponding rooms at the back looking into the college grounds will be used for a technical-room (in the basement), a laboratory, and two lecture-halls, one above the other, each with an area of over 1,900 ft. The second block, extending along Hope-street, will contain a recreation hall, 91 ft. long and 32 ft. wide. Above this will be a dormitory of equal size, whilst in the basement and the attic story additional storage in particular connexion with these two rooms will be obtained. On each floor this block will be connected with that facing Mount Pleasant but further facilities of exit will probably be provided in case of panic. An additional fireproof staircase has been designed at the end of the hall, which will extend the full height of the building from the basement to the attic. Messrs. Pugin & Pugin, of London and Liverpool, are the architects. The contractors are Messrs. Jones & Sons, of Pleasant-street, Liverpool.

NEW ROMAN CATHOLIC CHURCH, LOWESTOFT.—This church in Gordon-road, Lowestoft, was formally opened on the 5th inst. It is built of red brick relieved by Costessey ware. It is in the Perpendicular Gothic style. When completed the

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square tower will be 120 ft. high. The length of the building is 115 ft., and its width 53 ft. The interior consists of a centre nave 24 ft. wide and 52 ft. high, and two aisles 13 ft. 6 in. wide. Over the entrance door is the organ gallery, which is approached from the tower. The seating accommodation is arranged for 600 persons, but there is room for 200 more. A notable feature is the polished granite columns of the arcading. The sanctuary end is apse-shaped, and lit by five windows. The arch is bold in construction, with richly-carved caps. On either side is a chapel 13 ft. 6 in. by 15 ft., with a rose window. The sanctuary has a handsome reredos and altar, formed of Caen stone, and embellished by various mantles, while alabaster has been effectively utilised. The tabernacle is encased in the latter material. The lower panels of the reredos contain carved devices from the Litany of Our Lady. In the upper panels there are various pieces of statuary. St. Michael and St. Raphael standing on the left and right respectively. The centre is a canopy over the Benediction throne, enriched with marble shaftings. The centre of the altar is a panel representing the Nativity, and on either side is an angel in an attitude of adoration. The floor of the chapels and sanctuary are laid with Roman marble mosaic, which is also used in the altar steps. These are relieved by white marble risers and nosings. In Our Lady's chapel is a statue of Our Lady and Child. The ceiling of the church is formed in panel work of plaster with wood mouldings to allow for decorations. The whole of the carving and statuary has been done by Mr. Wall, of Cheltenham. The building will be lighted by electricity and warmed by radiators, the work being carried out by Messrs Waller & Smith, of Lowestoft. The Acme Flooring Company, of London, laid the wood-block flooring. The windows of the church are executed in cathedral glass by Messrs. Wever, of Norwich. The builders are Messrs. Hawes & Sons, of Norwich; and the architects are Messrs. G. & R. Baines, of Clement's Inn, Strand, and F. W. Richards, of Lowestoft.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, MALAHIDE, DUBLIN.—Mr. J. H. Swiney, M.Inst.C.E., has prepared a scheme for the supply of water to the town of Malahide. In his statement he remarks that the source of supply is at Westreave, some six miles to the west of the town, and consists of a large stream with three feeders, and is 200 ft. above the sea level. The average rainfall is 25 in., and the catchment area 350 acres. He calculated the daily discharge at 109,370 gallons, sufficient to provide for 200,000 persons. He estimated the total cost of lands and works, contingencies, and professional fees at 8,734*l*. He had previously—in 1895—recommended another and a cheaper scheme, one to cost about 5,000*l*, but this scheme had been rejected. He was opposed to a quarry hole scheme. His estimate included compensation to the Swords millers who used the water of the Westreave streams. Samples of the water had not been analysed, and no provision was made in his scheme for filtration.

MANCHESTER WATER SUPPLY.—The Manchester Waterworks Committee, at their meeting on the 5th inst., reported that the stock of water at present on hand is equal to a supply for 111 days, based upon an estimated average daily consumption of 32,000,000 gallons, as compared with a ninety-nine days' supply this time last year, when the estimated daily consumption was 35,000,000 gallons. It is computed that there are now 4,203,000,000 gallons of water in the reservoirs, as compared with 4,050,000,000 gallons this time last year. In these circumstances the Committee view with comparative equanimity the prospects of the coming summer and the demands likely to be made upon their resources. They do not anticipate that any difficulty will arise in regard to the supply. The laying of the pipes on the southern erection of the Thirlmere Aqueduct has been proceeding for some weeks, and it was reported that satisfactory progress was being made. The contractor for the northern section is making arrangements to at once commence work on that section.—*Manchester Guardian.*

MOURNE WATERWORKS EXTENSION, BELFAST.—Sir A. R. Binnie has reported to the Belfast Water Commissioners on the subject of the construction of Brackenagh Tunnel, on the following points on which his opinion has been requested, namely:—Is the construction of the remaining 168 yards of the small tunnel reasonably possible with the use of compressed air, a shield, and other usual and necessary appliances? To this he had no hesitation in stating that, from his experience of work of a much more dangerous and difficult character, that, with reasonable skill and precaution and proper organisation, there should be no difficulty in carrying out the work to a successful termination; and if proper precautions were taken and energy applied in the construction of the work, it should proceed at the rate of about 10 ft. a day. The other point was as to whether in his procedure the contractor acted with reasonable prudence and skill, having regard to the procedure usual in tunnel work of this class in soft ground? On this point his opinion was very decided, and was to the effect that, since the contractors had commenced the cast-iron lined portion of the tunnel without the use of a shield, they had been incurring a great risk and danger in their procedure. It was clear, from your resolution of November 7, that the payment of a sum of 2,640*l*. was then made clearly on the condition that the cast-iron portion of the work should be carried on in compressed air and by means of a shield, the cast-iron plates being properly grouted up as the work proceeded. The difficulties and delays which had occurred since January last, and the dangers which had been run, had been entirely due to the contractors endeavouring to carry on the work without a shield, and without backing up the plates with grout under pressure, as was clearly anticipated in the Board's resolution of November 7 last. As to the future, he heard from Mr. Macassey that they had engaged an inspector skilled in this class of work. He had also, in conversation with Messrs. Fisher & Le Fanu, given them the best advice in his power as to the details in procedure, and he felt pretty confident that if the work was carried on with ordinary prudence and no unforeseen difficulties arise, it should be completed in a manner satisfactory both to themselves and the engineer.—*Belfast Evening Telegraph.*

FOREIGN.

RUSSIA.—It is announced that the railway extension from Kushk to Chahid Dukhteran on the Afghan frontier has now been finished. This extension is chiefly for military strategic purposes.——New sources of petroleum have been tapped in Bokhara, and it is anticipated that considerable expense will be saved in Central Asia by distributing the oil from that centre instead of from Baku, as at present.——The granite industry of Finland is growing, and the authorities at Helsingfors are encouraging the introduction of foreign capital for the working of some quarries at Hango and other places on the Gulf of Finland.

INDIA.—The local authorities of Rangoon have adopted the main details of a scheme by Mr. G. C. Buchanan, for the improvement of the Rangoon port trust properties, involving an expenditure of nearly a crore of rupees.——Improvements on a large scale are about to be undertaken in Ootacamund, and include the rearrangement of the drainage, a sewage farm, electric lighting, improvement of the lake, and the purchase and destruction of insanitary tenements.——New staff quarters for the traffic department are to be erected at Lahore, at a cost of 206,367 rupees.——New shipping offices are to be erected near the docks, Kidderpore, for the accommodation of native seamen.——The Government grant for the extension of railways in Burmah has been considerably curtailed, and it is anticipated that the only construction to be continued this year will be on the Bassein-Henzada line, and a few miles to Lasio.——The River Steam Navigation Company are about to open several stations for goods traffic on the Dhalleshewary service, in Eastern Bengal.——The Straits Legislative Council have unanimously passed a Bill for the introduction of electric tramways in Singapore.——The newly-executed Madura-Pamban branch of the South Indian Railway is ready, and has been recommended by the senior Government inspector for opening for traffic. The length of the line is about ninety miles.——The palace at Mysore is to be reconstructed at a cost of Rs. 2,492,092.——The new institute for the railway employés, at Karachi, is now practically completed.——The sanitary condition of the city of Ahmednagar is to be improved, and a scheme, the execution of which will cost 2½ lakhs of rupees, has been approved.

UNITED STATES.—The Legislature of Maryland has adopted a plan for adding to the State-house at Annapolis, which is far too small to accommodate State business. The addition is to be about twice as large as the original building, but arranged to harmonise with it.——The New York superintendent of buildings has stopped work on the new hotel for the Astor estate, on the ground that wood was being used in finishing, which, while intended to be fire-proof, as the law of New York requires in all buildings more than 150 ft. high, is not satisfactorily so. Under the circumstances, American architects are inquiring of the superintendent what in his opinion is an absolutely efficient process for fire-proofing timber.

MISCELLANEOUS.

PROPERTY SALES.—The remaining portions of the Duke of Beaufort's estates in Monmouthshire were disposed of two weeks ago by the sale of properties in the Chepstow, Newport, and Usk districts, for a total sum exceeding 12,000*l*. In many instances, as on the previous occasions, the tenants purchased their own holdings. The Duke withdrew from the sale the Grosmont Town Hall, built in 1832, and conveyed it freely to the Parish Council. He also gave to the trustees the Gilgal Chapel at Llanvaches, one of the earliest homes of Welsh Nonconformity. Wentwood Forest, 2,244 acres, reputedly the largest wood in England and affording fine views of the valleys of the Usk and Wye and the Severn estuary, was withdrawn at 7,500*l*.—the timber, valued at 11,824*l*. excepted, but an offer has since been received by the auctioneer, Mr. Henry Jonas, of Messrs. Driver, Jonas, & Co., who also, after a bid of 400*l*., withdrew a frontage of some 1,700 yards to the Usk at St. Julian's, Newport. The lordship of Llantilio-Grossenny, with the ruins of White Castle, realised 500*l*., and 250*l*. were taken for Grosmont Castle with the Manor of Three Castles. The two castles played their part in the border warfare of the Marches. The latter, measuring 110 ft. by 70 ft., is commonly identified with Rosslyn, or the Castle of the Red Rose, the residence of the Earls and Dukes of Lancaster when Grosmont was a town of considerable extent and importance. White, or rather Llantilio, Castle, a stately ruin on an eminence near the river Trothy, and encompassed with a deep moat, was rebuilt, it is believed, *temp.* Stephen, having been bestowed by William I. upon his follower, Brian, Earl of Hereford. Skenfreth (on the right bank of the Monmow), Grosmont, and White Castles, forming a triangular group in the northern part of the county, were dismantled by Edward IV., before Monmouthshire had been taken out of Wales. Most of the properties—which include Monmouth, Chepstow, Raglan, and Usk Castles, Tintern, and Troy House, or Mitchell Troy (Trothy), the Duke's Seat, and attributed to Inigo Jones—that have been dispersed by sale during the past two years came to the house of Somerset in virtue of their descent from John of Gaunt, and William, Herbert of Raglan, Chepstow, and Gower, Earl of Pembroke, whose daughter Elizabeth married Sir Charles Somerset, first Earl of Worcester.—The Abbey, at Sutton Courteney, Berkshire, has been placed in the market; the house, which was originally built in the fourteenth century and still retains many of its pristine features, is situated on the Thames, near Abingdon, and originally formed a hospital appertaining to the Benedictine Abbey in that town.—The Duke of Argyll is about to dispose of Tiree Island, which extends over 21,750 acres, and yields a rent-roll of about 4,600*l*. per annum. The island has belonged to the Campbells from a very remote period.—After trial by Mr. Under-Sheriff Burchell and a special jury at the Sheriff's Court, Red Lion-square, a verdict by consent was accepted on behalf of the trustees of the Boys' Parochial Charity School, Lambeth, who thereby agreed to take 17,000*l*. from the London and South-Western Railway Co., who scheduled the site and buildings for the widening of their line between Waterloo terminus and Clapham Junction.—A few weeks ago were sold for 6,100*l*. the premises latterly known as the Eagle iron foundry, which mark the site of the old Bear Garden at Bankside, Southwark, where bear and bull baiting and other brutal sports were held until the closing years of the seventeenth century.

BOOK SALES.—Amongst the works contained in the late William Twopeny's library dispersed at Sotheby's a few days ago were the following:—Billing's "Baronial Antiquities of Scotland," four volumes, 1845-52, 11*l*. 10s.; Viollet-le-Duc's "Dictionnaire de l'Architecture," ten volumes, 1858-68, 10*l*.; Ackermann's "Microcosm of London," three volumes, 1808-10, 16*l*. 15s.; the Burlington Fine Arts Club "Catalogues of Enamels, Steel and Iron-work, and Silversmith's Work," three volumes, 1897-1901, 22*l*. 13s.; Dugdale's "Monasticon," eight volumes, 1840, 15*l*.; and Burton's "Leicestershire," 1622, 9*l*. 5s. Another collection comprised Malton's "City of Dublin," 1792, 17*l*.; Nayler's "Coronation of King George IV.," 1839, 10*l*. 10s.; Sheraton's "Cabinet Maker," 1791-3, 8*l*. 15s.; and Chippendale's "Cabinet Maker," 1754, 8*l*. 12s. 6d.

THE ALMSHOUSES, UTTOXETER.—Mr. E. Forshaw has been appointed architect for the restoration and re-instatement of the almshouses in Carter-street, which were built for poor widows on the foundation of Katharine Mastergent by her will, dated March 20, 1646. The charity was augmented in terms of the will, dated March 23, 1720, of John Wright.

CORONATION DECORATIONS.—We hear that Mr. Bodley has agreed to prepare a scheme for the proposed decoration of the Royal Institute premises in Conduit-street, and that the designs for the decoration of London Bridge and its approaches have been entrusted by the Corporation to Mr. George H. Birch. Mr. Birch's designs comprise two triumphal arches, bedecked with garlands, and lines of columns and masts upon the parapets to be connected by floral festoons and hangings, and carrying trophies of arms, gilded lions rampant, and other appropriate emblems; the prevalent colours will be red and white, as on the City heraldical shield. Mr. J. T. Micklethwaite prepared the designs for the copes, the frontal of the high altar, and the pall of Edward the Confessor's shrine, that will be used during the ceremony in the Abbey, and are being made by needlewomen at Messrs. Watts & Co.'s works, Baker-street.

EXHIBITION OF ENGRAVING AND ETCHING.—The Board of Education have decided, at the suggestion of the Council of the Society of Arts, to hold during the early part of next year an exhibition of engraving and etching in the Victoria and Albert Museum, South Kensington. The exhibition will consist of examples of copper and steel engraving, including line, mezzotint, and stipple (plain and

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coloured), aquatint and etching. The Board are being assisted in the selection and arrangement by an influential committee, which held its first meeting at South Kensington on the 4th inst.

ST. MARY MAGDALENE CHURCH, MUNSTER-SQUARE, N.W.—A scheme drawn up by Mr. Micklethwaite gives estimates of sums that might be spent in improvements of the church by the erection of a chancel-screen with loft (1,000*l.*), side screens (800*l.* each) returned stalls, a south-side altar, re-arrangement of the steps, and new ventilation, electrical lighting, repair of the organ, &c. (1,400*l.*) The church, illustrated in the *Builder* of July 28, and (the sedilia) August 11, 1855, was erected in 1849-52 after R. Cromwell Carpenter's plans and designs for 500 sittings, and completed, except as regards the tower and spire, with the north aisle and its crypt and mortuary by R. Herbert Carpenter and B. Ingelow, 1883-4, in memory of the late Rev. E. Stuart who had built the nave, chancel, and south aisle. The seven lights of the east window are filled with glass by Hardman from a design by A. W. Pugin; the west window, by J. R. Clayton, forms a memorial, set up *e curis* Beresford Hope, of R. C. Carpenter, the architect, who died in 1855. Butterfield made the designs for the Resurrection and Pentecost windows (Messrs. Clayton & Bell) in memory of the late Baron Alderson. The fabric has been further adorned from time to time with decoration in polycrome by Messrs. Crace, and with coloured glass in the side windows of the two aisles, severally by Messrs. Lavers & Barraud, Clayton & Bell, and Heaton & Butler, and in the large five-light window at the east end of the south aisle with one on the south side of the sanctuary by Hardman. The organ (1852) is by Gray & Davison.

WINCHESTER COLLEGE PROJECTS.—At a meeting of Wykehamists recently held in the Temple at Winchester College, it was resolved to perpetuate in a tangible form the memory of former students who have died in South Africa, and a committee was appointed to invite subscriptions and carry out the scheme. Matters have now so far advanced that it has been determined the memorial shall take the form of a new Commoners' gate, to replace the existing plain structure in Kingsgate-street, opposite the end af St. Michael's-passage. A number of architects (old Wykehamists) have been invited to submit plans. It is also announced that an important block of buildings in connexion with the College is about to be erected, for the purposes of a school of music, laboratory, and science department. The actual site has not been definitely decided on, but the plans of Messrs. Cancellor & Hill, architects, of Winchester, have been accepted.

PRINCE CHRISTIAN VICTOR MEMORIAL.—Mr. Goscombe John, A.R.A., has been entrusted with the work of executing the statue of the late Major Prince Christian Victor, who died in South Africa during the war. The statue, which is to represent the late Prince in khaki, will be erected on a site near the Hundred Steps of Windsor Castle, at the foot of the main thoroughfare leading through the town to the Castle. Mr. A. Nutt, architect at Windsor Castle, has been entrusted with the erection of the canopy to receive the statue.—*Daily Chronicle.*

LEGAL.

DISPUTE BETWEEN CONTRACTOR AND THE LEEDS CORPORATION.

THE case of Cross (trading as Cross & Cross) *v.* the Corporation of Leeds came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, on the 2nd and 3rd insts., on the appeal of the defendants from an order of Mr. Justice Bucknill in Chambers, affirming a decision of the Master, and refusing to refer the question in dispute to arbitration. The action was brought under a contract between the plaintiff and the Leeds Corporation for the construction of works in connexion with the extension of the Corporation markets. The defendants alleged excessive delay on the part of the contractor, but the plaintiff's answer to this was that there was delay on the part of the defendants themselves in delivering the plans. It appeared that there was a clause in the agreement providing that all disputes should be referred to the arbitration of Mr. Houston, the City Engineer, but in view of a letter written by that gentleman to the effect that the plaintiff's claim was outrageous the plaintiff contended that the City Engineer was not competent to try the case fairly. Mr. Justice Bucknill took this view, and refused to refer the case to arbitration. Hence the present appeal.

It was contended on behalf of the defendants (appellants) that the agreement between the parties having stipulated that all questions should be referred to the arbitration of the City Engineer this case ought to be arbitrated upon by him, he certainly having been guilty of no misconduct in his capacity as arbitrator, whatever he might have stated in his capacity as City Engineer.

At the conclusion of the arguments their lordships held that there was no reason to suppose that the City Engineer would not try the case fairly between the parties, and allowed the appeal.

Mr. Lawson Walton, K.C., and Mr. Montagu Shearman appeared for the appellants; and Mr. Lawrance, K.C., and Mr. Willis for the respondent.

IS A LADDER SCAFFOLDING?

POINT UNDER THE WORKMEN'S COMPENSATION ACT.

IN the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Romer, on the 6th inst., the hearing of the case of Marshall *v.* Rudeforth concluded on an appeal by the plaintiff, the workman, from the refusal of the County Court Judge of Scarborough to make an award in his favour in an arbitration under the Workmen's Compensation Act, 1897.

It appeared that the plaintiff was employed by the defendant in executing repairs to the roof of a house which exceeded 30 ft. in height. To enable the plaintiff to get on the roof from the street a ladder was placed against the house, one end of it resting on the ground and the other against the parapet at the top of the house. The plaintiff, while carrying slates up the ladder, slipped, fell, and was injured. It was admitted that the defendant was the "undertaker" within Section 7 of the Act. The learned County Court Judge, however, held that the ladder was not scaffolding within the meaning of Section 7, Sub-section 1, and, therefore, the plaintiff was not at the time of the accident employed on, in, or about a building exceeding 30 ft. in height which was being repaired by means of scaffolding, and that, therefore, the Act did not apply.

Mr. Longstaffe, on behalf of appellant, argued that a ladder was scaffolding, it being a ready-made contrivance with two uprights and crosspieces, and it was being used for the repair of the house.

Without calling upon Mr. Ruegg, K.C., for the respondent, the court dismissed the appeal, the Master of the Rolls observing that as the County Court Judge had found as a fact that the ladder was not a "scaffolding," unless this court could say, as a matter of law, that a ladder so used must be a scaffolding they could not interfere. After the recent decisions in the House of Lords he confessed that he was unable now to give a definition of the word "scaffolding" in terms which would necessarily exclude a ladder. But that was a different thing from saying that the word "scaffolding" necessarily, as a matter of law, included a ladder, and, therefore, he could not say that the learned County Court Judge might not find without misdirecting himself that the ladder was not a scaffolding.

The Lords Justices concurred.

IMPORTANT POINT UNDER THE WORKMEN'S COMPENSATION ACT, 1897.

THE case of Elizabeth Hill *v.* The Norfolk Cold Storage & Ice Manufacturing Co., Limited, came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy on the 9th inst., on the appeal of the defendants from an award of the County Court Judge of Great Yarmouth sitting as arbitrator under the provisions of the Workmen's Compensation Act, 1897. The plaintiff, a widow, claimed compensation for the loss of her husband who was killed by an accident in the course of his employment with the defendants. The defence was that the accident did not occur "on, in, or about" a factory, and that if it did the factory was not at the time in the "occupation" of the defendant's. The learned County Court Judge decided both points in favour of the plaintiff and awarded her 150*l.* compensation. Hence the present appeal.

Mr. J. B. Matthews appeared for the appellants; and Mr. Hextall for the respondent.

Mr. Matthews said that the principal question which this court would have to consider was whether the place where the accident occurred and which was undoubtedly by way of becoming a factory, was a factory within the meaning of the Act at the material time. The defendants had constructed a building at Yarmouth, one half of which was to be used for the manufacture of ice and the other half as a cold store. One side of the building fronted on a quay alongside an arm of the sea, while the other side faced a road, on the opposite side of which was a railway. At the time of the accident the building was being used by the contractors for the purpose of testing the ice manufacturing machinery which they had put in. By the terms of the agreement the defendants were under contract to deliver any chloride of calcium which was required in the course of the testing. The chloride of calcium, which was contained in drums, was brought to the works by rail, and the deceased workman was one of the men engaged by the defendants to take the drums from the railway-truck to the building. He was paid 1s. for the job. One of the drums on being rolled from the truck fell on the man, killing him. It was argued before the County Court Judge that not only the ice-manufacturing portion of the building was a factory, but that the whole, being under one roof, was a factory. The accident happened outside the cold store. He contended that that part of the building was not a factory. There was no interna communication between the two portions of th building, the only connexion being a shoot through which the ice would be pushed when manufactured, and at the time of the accident that shoot had not been opened.

The Master of the Rolls said that a warehouse was considered to be a factory for the purposes of the Act. Why was not this cold store a warehouse?

Mr. Matthews said it was not a warehouse for the same reason that the ice-manufacturing portion of the building was not a factory—it was not yet in use. His submission was that the manufacturing portion of the building did not become a factory, or the cold store a warehouse, till business was begun by the defendants. This did not occur till some time after the accident.

Mr. Hextall, for the respondent, submitted that there was ample evidence before the learned County Court Judge to justify him in his conclusion that the place where this accident occurred was a factory.

The Master of the Rolls, in giving judgment, said the question to be decided was whether the learned County Court Judge had drawn the proper inference from the facts. Mr. Matthews had argued that this building, which was ultimately to be used as a factory, was not in point of law a factory at the time because it was not being carried on for the purposes of gain, but was being used by the contractors for experimental purposes. Whether or not that contention was right it was not now necessary to decide, because he thought the case could be disposed of otherwise. A warehouse was one of those places which under the Act was to be considered a factory, and, in his opinion, that part of the building in question to be used as a cold store answered the description of a warehouse. There was evidence to show that the defendants at the time of the accident were the occupiers of that warehouse, because they were supplying the chloride of calcium necessary for testing the machinery; and further, he thought, there was evidence, if such evidence were necessary to bring the case within the Act, that the building was at the time of the accident being used as a warehouse. That being so, the County Court Judge was justified in holding that the accident happened "on, in, or about" a factory of which the defendants were the occupiers. The appeal would be dismissed, with costs.

The Lords Justices concurred.

WEST-END BUILDING DISPUTE.

MR. JUSTICE BYRNE, in the Chancery Division, on the 10th inst., delivered a considered judgment in the case of Kolckmann *v.* The Berkeley Hotels, Ltd.

This was an action by the plaintiff claiming an injunction to restrain the defendant company from erecting any staging, staircase, or other erection on or overhanging the plaintiff's premises, No. 3, Berkeley-street, Piccadilly, and from suffering any such staging or erection, recently erected, to remain on or overhanging the plaintiff's premises, and from obstructing the access of light and air to the skylight and windows of the plaintiff's premises, and also to restrain the defendants from trespassing on the plaintiff's premises.

The plaintiff's case was that on March 18 last he purchased from the defendant company the lease of No. 3, Berkeley-street, for a term of about sixty-three years for a sum of 6,000*l.*, there being a covenant by the defendant company, who owned the adjoining premises, that the company would not object to the plaintiff raising the roof of No. 3, Berkeley-street, and thus doing away with one of the small windows in the wall of the defendant company's hotel. The plaintiff alleged that since the date of the execution of the assignment defendants had trespassed upon his property, and had erected a staging and staircase partly overhanging and partly resting upon the plaintiff's property, and had thus completely blocked up and obstructed the lantern skylight affording access of light and air to the property, and had broken the glass thereof, and had erected the staircase complained of, which not only darkened or obstructed the light to the windows at the rear of the plaintiff's property, but to so overhang the same as to prevent the plaintiff from raising the roof as provided by the agreement. It appeared that the staircase had been erected for the purpose of affording the residents at the hotel a means of escape in the event of fire, and the bottom landing or staircase rested upon, and was built into the wall immediately under, a window on the half-landing between the first and second floors at the rear of the plaintiff's house, from which there would be no means of egress except through the window of the plaintiff's house.

The defendants alleged that they were compelled to erect a fire escape for the hotel by the order of the London County Council, and that the plaintiff in the course of negotiations for his lease was informed of the proposed means of escape and the manner in which it was proposed that the staircase should be constructed: that tracings of plans of the proposed work were submitted to the plaintiff and approved by him and signed by his authorised agent prior to the completion of the purchase: that the defendants completed on the faith that the plaintiff had assented to the staircase being constructed in the manner shown on the plans and that if the plaintiff had not given such assent the

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defendants would not have completed. Alternatively the defendants relied on the Statute of Frauds, and to the fact that the plaintiff, after being aware of the construction of the staircase, had stood by and permitted the defendants to expend large sums of money thereon. In consequence of this delay, the defendants alleged that it was too late for the plaintiff to assert the claim made in the action.

Mr. Levett, K.C., and Mr. A. Beddall appeared for the plaintiff; and Mr Rowden, K.C., and Mr. J. Austin Cartmell for the defendant company.

His lordship concluded the hearing of the evidence on the 7th inst., when he said he would take time to consider his judgment.

His lordship, in giving judgment, after stating the facts, said it was clearly proved by the evidence which had been called before him that the staircase complained of was so erected as to seriously interfere with the access of light to the plaintiff's premises, and if it were allowed to remain the value of the house, No. 3, Berkeley-street, the subject matter of the transaction between the plaintiff and the defendant company, would be undoubtedly lessened. He was of opinion that the defendants, in the construction of the escape, which was in the nature of a spiral staircase, had committed an act of trespass on the plaintiff's premises. That being so, the question in the case turned upon whether the plaintiff's agent, viz., his solicitor, had authority to approve the plans submitted to him by the defendants in such a way as to bind his client to accept a property which would, in consequence of the erection in question, be considerably less valuable than the property he had agreed to purchase. He came to the conclusion that plaintiff's solicitor had no authority to bind his client in the way suggested by the defendants. The result of what the defendants had done was to encroach upon the plaintiff's property and alter the subject matter of the contract between the parties. His view was that the plaintiff was entitled to his injunction, which must be to prevent the continuance of the staircase in such a way as to rest upon or overhang the plaintiff's premises. As well as his lordship could make out, the operation of such an injunction carried away about one-half of the structure longitudinally. What he meant was that no part of the structure must remain on the plaintiff's premises, nor must it overhang his premises. With reference to the damages claimed, it had been put to him on behalf of the plaintiff that the plaintiff could not proceed with alterations to his property having regard to this litigation, and had thereby been kept out of the use of it for a certain period. He did not think that there was any necessity to have an inquiry as to damages as to that. He suggested that the learned counsel on both sides should attempt to agree to the amount of damages to which the plaintiff was entitled. They ought to agree upon some reasonable sum.

After Mr. Rowden and Mr. Levett had consulted together, it was announced that the damages had been agreed at the sum of 50*l*.

Mr. Rowden asked on behalf of the defendants that the operation of the injunction might be suspended to enable the defendant company to carry out the order of the Court.

After some discussion it was arranged that the defendant company should remove the bottom part of the escape and make good the damage to the plaintiff's skylight within ten days and remove the remainder within six weeks.

The plaintiffs were awarded the costs of the action.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

2,553.—ARC LAMPS AND THEIR FITTINGS: *A. Eckstein & A. E. Angold.*—An enclosed-arc clutch lamp comprises a series solenoid, resistances or choking coils, a central tube that connects upper and lower plates which sustain a dash-pot, &c.; two rods carry the clutch at its ends, one rod is held up with a spring on the lower plate, the other is joined with a vertical slot to a pin upon a regulation-lever which is fulcrumed on to the central tube; a weight and the piston of the dash-pot are carried by the other end of the lever, but are overbalanced by the weighted core of the solenoid, which reposes on a lever and under normal conditions in such a manner as to sufficiently balance the movable parts, otherwise a spring is interposed to arrest vibration from the core to the lever when alternating currents are used. In modified adaptations the cores and solenoids are replaced with electro-magnets and armatures, or the solenoid and dash-pot are inverted on the lower plate with the addition of a shunt solenoid and core. For the clutch confer No. 16,410 of 1899.

2,578.—JOINERS' CRAMPS: *F. E. Glover.*—The bars of two cramps are joined to constitute one long cramp, having adjustable jaws at each end. Collars unite the bars that carry the jaws. If the bars have ratchet-teeth the tops of the collars are serrated or are fitted with serrated pieces for engagement with teeth upon the bars by wedges. If the bars have holes a wedge is inserted in the collar and a pin is passed through two holes that coincide, and in the case of bars having a T-section a rib upon the collars will go between the vertical webs of the bars.

2,611.—GRATES AND DOORS FOR BRICK-KILNS, FURNACES, AND DOMESTIC FIREPLACES: *A. J. Twamley.*—The grates consist of louvre-like bars, mounted either in grooves in side-frames or adjustably upon end-pivots, and are kept in position and at the angle desired with projections. Inclined webs are cast upon the frame, which is cooled by means of an air-space between it and the brickwork. The doors, made of fireclay slabs or tiles, slide in grooved guides having projections that are built into the brickwork.

2,613.—CONSTRUCTION OF KILNS: *R. Snowdon.*—Two sets of openings are made in the permanent or temporary dividing walls between the chambers of a continuous or semi-continuous kiln. The upper openings can be closed during the heating process with bricks that rest upon ledges, and may be dislodged with a rod thrust through the firing-holes. The lower openings can be closed during the cooling process by dropping material in front of them, or with slabs or "quarls" shifted in turn—the shifting being facilitated by "cranking" the upper passages and thereby bringing the openings on the outer side nearer to one another. For a kiln having transverse arched chambers, whereof each is subdivided, the lower connecting-passages of the end-chambers are made in the end wall of the kiln, the upper connexions being fitted with plug-dampers, and closed during the course of charging.

2,617.—SPIGOT-AND-SOCKET AND OTHER PIPE-JOINTS: *A. Eadie and J. Tannahill.*—In order that the flanges may bear upon the shoulders of the collars, the inventors fashion collars at the ends of the tubes or pipes; by that means a spigot for the end of the one pipe is provided by the lower flange; the joint is to be made good by a tightening of the bolts.

2,628.—CRANES FOR HOISTING: *G. Russell.*—The invention relates more especially to cranes that give a large amount of clearance under the lower end of the jib, which is constructed triangle-wise and is pivoted to the apex of a three-sided frame. The jib-end is linked to a nut in engagement with a screw, and the out-reach of the jib is varied by turning the screw; the nut is also joined to a distance-link. Otherwise, by way of modifying the variable screw connexion between the carrying-frame and the jib-end, the nut may be secured on the latter, and the link between the nut and the jib-end will, in that form, be replaced with the screw.

2,653.—CLEANING OF DRAIN PIPES, &C.: *G. B. Wilson.*—For removing obstructive matter is devised a scoop or scraper pivoted at its one end and joined to a rod that extends either through or along a shaft to a handle; the blade can be set anglewise with the shaft by the working of the handle.

2,677.—IMPROVEMENTS IN CRUCIBLES: *A. A. Crosby.*—The perforated bottom of the crucible, which rests upon brackets within the furnace, constitutes a chamber into which a pipe conveys gaseous or liquid fuel, so as to furnish additional means of heating; in another shape a coil of pipes pierced on the lower side for the passage of the fuel is substituted for the perforated false bottom of the crucible, from which the molten metal can be drawn off through a tap-hole in the V-shaped base; or a vaporising-coil may be used as a supply-pipe and be passed through an aperture in the crucible directly to the gas chamber.

2,700.—BOLTS AND FASTENINGS FOR USE IN CASES OF EMERGENCY: *F. J. J. Gibbons.*—Recesses in the keeping-plate and the knob-end of a pressure-bar hold a pin that secures the plunger of the knob-end; the double-threaded screw of the plunger engages with a nut inserted through the door and held up on the inside with a box and on the outside with a plate; to a disc at the inner end of the nut are pivoted the ends of links whereof the opposite ends are joined to sliding bolts that fasten the door and are normally in the shot position, but the bolts will be withdrawn as the disc is turned when the plug is forced inwards by pushing the pressure-bar; thereupon a pivoted arm engages with a slot and the bar is locked to a cover-plate that closes the box, and the bolts are secured as withdrawn; the fastening, which is available for each of two double doors, can be worked from without.

2,728.—TILES FOR ROOFING PURPOSES: *W. B. Heap.*—To keep out rain and snow, and to prevent dislodgement of the tiles by wind, they are fashioned with raised edges and interlocking cross ribs besides the ordinary hanging-ribs; for adjustment of the tiles in their places their lower edges have V-shaped raised parts, and some of the ribs are notched in the middle that they may fit over the other ribs.

2,776.—ELECTRICAL FUSES: *Callender's Cable and Construction Co. and J. O. Callender.*—A cut-out especially intended for use in boxes under ground has contacts or pillars affixed upon the base, over which are slipped sleeves that are connected by a fuse which is put in a glass tube enclosed in a slotted ebonite casing for a handle, and which holds the sleeves.

2,792.—AN AUTOMATIC SPRINKLER-VALVE FOR EXTINCTION OF FIRE: *J. C. Merryweather and C. J. W. Jakeman.*—A spiral spring forces the valve upwards against its seating, its lower end being sustained with a bridge, of which the ends are carried by projections from two bent levers. The free ends of the levers are soldered on to the casing. As the heat melts the solder, the ends of the lever will turn outwards and the valve will descend.

2,842.—A VARNISH FOR EXPOSED WORK: *G. W. Flather.*—The inventor makes a varnish which he claims to be capable of resisting the action of the air, ammonia, and some acids, of a solution of amber in unboiled linseed oil at a temperature gradually increased to above 700 deg. F. The solution is thinned with the addition of turpentine when it has become cool.

2,860.—OVENS FOR BRICKS: *Baron V. Barreto.*—The ovens are for hardening bricks made of lime and sand by the action of steam. They are constructed of metallic plates, lined with brickwork, in the shape of a tunnel or arch, steam being admitted through perforated pipes laid along the floor. The trucks which carry the bricks run upon rails through the tunnel.

2,861.—PROCESS OF SLAKING LIME: *Baron V. Barreto.*—The lime is intended for use in making bricks of lime and sand. A rotary drum is charged with unslaked lime and sand. After an interval of rotation water is admitted through a pipe set axially with the drum, which is again turned on the shaft that carries mixing arms, which are caused to turn in the opposed direction. A steam pressure of from 40 lbs. to 50 lbs. on the square inch is generated by the slaking of the lime. When that pressure has been kept up during four minutes the steam is blown off through the pipe, and the material is taken out.

2,870. — IMPROVEMENTS IN PROTRACTORS: *R. W. W. Thom.*—The novelty of the invention is claimed as consisting of a glass disc set within a frame and on which the centre of the protractor is marked. The frame and disc are inserted in one leg of a parallel ruler.

2,889.—WATER SUPPLY FOR DOMESTIC PURPOSES: *W. Thomson.*—With the depression of the closet-seat a rod on the outside rises to rock a lever so as to open a valve in the supply-cock, together with the shutting of the discharge valve, whereupon the cistern is filled. After the discharge, the water flows through the top of a cup until a float shuts the opening. The remaining quantity of flush-water flows through apertures near the bottom of the cup. The pressure of water maintains a disc upon its seating within the subsidiary valve, the disc being fitted at the lower end of the valve-stem. The mode of packing the stem with a ring which is compressed by the water upon a cone-shaped washer, is described as being applicable for the valves of lavatory basins and similar fittings.

2,904.—BRICKS AND BLOCKS FOR BUILDERS' USE: *W. Wright.*—Ribs and recesses made upon the bricks are devised for holding the pointing-strips in position; in another form the bricks are made with coloured edges to represent pointing and have recessed bedding edges that will take the mortar, or with grooves for the pointing material. The strips may be inserted into recesses or be laid on the flat surfaces of the bricks.

2,948.—REPAIRING AND RESURFACING OF FLOORS: *F. B. Gardiner and W. H. K. Abbott.*—The portable machine has the shaft of its circular saw mounted upon the free end of a radial frame that rocks upon another shaft which enables one to lower the saw so as to cut the floor-boards whilst an adjustable gauge-plate regulates the depth of the cut; a toothed wheel, which is driven with a belt from a cranked pulley, drives the saw through an idle pinion, worm gearing communicates motion from the axis of the wheel to a shaft, and so, by bevel gearing, to carriage wheels on one axis of the frame; one wheel on the other axis is grooved for a guide-rail secured to the floor; for the saw may be substituted a smoothing or grooving plane.

3,029.—IMPROVEMENTS IN SANITARY FITTINGS AND APPLIANCES: *W. D. Cliff and E. F. Reynolds.*—The invention concerns the inlets, outlets, and overflows of lavatory basins, sinks, closets, baths, urinals, and so on; behind the openings of a sink or wash-basin overflow is placed a receiving vessel, shaped as a funnel, and having an access-hole above; in the undercut recess of the outlet is placed a metallic coupling-tube, to the flange of which the waste pipe is affixed. In another form the coupling-tube fits into an enlargement of the discharge outlet and is further secured with bolts. For a weir-overflow the inventors devise a screw or a hinge for securing the grating in its place over the receiving vessel.

3,101.—ORNAMENTAL WORK IN CEMENT, CONCRETE, ARTIFICIAL STONE, &C.: *F. Howett*—Inlaid ornamental designs are produced by laying patterns or designs of various materials upon the floor, wall, or other surface, and filling the spaces with concrete or some such plastic body. The method is described as being available for hearths, mantelpieces, shop fronts, steps, &c.

3,106.—A FLOORING CRAMP: *T. Potter.*—A cramp, devised for use in the fixing of floorboards that do not repose upon joists, consists of a lever, bifurcated or otherwise, to be turned upon a pivot-pin

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that passes through one of the holes in the fork of the lever and through one of a set of holes in a temporary joist, which is laid so as to abut against the wall or skirting, whilst a strut maintains the lever in place for the working.

MEETINGS.

SATURDAY, JUNE 14.

Incorporated Association of Municipal and County Engineers.—Midland District meeting, Wolverhampton. Assemble at Town Hall, 10.45 a.m.

Edinburgh Architectural Association. — Visit to St. Monan's Church, Fife.

St. Paul's Ecclesiological Society.—Visit to Langley and Upton.

Institute of Sanitary Engineers.—Provincial summer meeting, Buxton. Assemble at the Town Hall. 10.45 a.m.

MONDAY, JUNE 16.

Clerks of Works' Association.—Mr. A. Adams on "Brickmaking Ancient and Modern." Carpenters' Hall. 8 p.m.

TUESDAY, JUNE 17.

Palestine Exploration Fund.—Annual meeting at Royal Institution. 4 p.m.

Institution of Junior Engineers.—Visit to the Globe Rope Works, East Ferry-road, Millwall.

WEDNESDAY, JUNE 18.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting. 8 p.m.

THURSDAY, JUNE 19.

Royal Institute of British Architects. — Annual Dinner, Whitehall Rooms, Hôtel Métropole.

Society for the Encouragement of the Fine Arts.—Annual Dinner.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

May 20.—By R. DALTON & SON (at Carlisle).

Nether Denton, Cumberland.—Birch Cragg Farm, 83 a. 3 r. 1 p., f. £3,000

May 24.—By FULLER, MOON, & FULLER (on estate).

Purley, Surrey.—Brighton-rd., &c., 11 freehold building sites 4,299

May 27.—By KNOWLMAN & SONS (at Tiverton).

Holcombe Rogus, Devon.—Moiety of rectorial tithe rent charge of 107*l.* 10s. 2,000

By W. BROWN & Co. (at Thame).

Long Crendon, Bucks.—Bones Closes, 8 a., f..... 400
Five copyhold cottages and ½ a. 200
Great Milton, Oxon.—House and 44 a., f., y.r. 38*l.* 2s. 2d. 790

May 28.—By JAMES T. PEAT (at Redhill).

Burstow, Surrey.—Roundabout Farm, 53 a. 2 r. 16 p., f., y.r. 55*l.* 1,240

By KNOWLMAN & SONS (at Musbury).

Musbury, Devon.—Stedham's Orchard, f..... 78
Crossway House and May House, f. 780
Three houses, two cottages, and blacksmith's shop, f..... 578
Various enclosures, also two orchards, 36 a. 3 r. 8 p., f. (in lots) 3,103

By DRIVER, JONAS, & Co. (at Newport).

Llangstone, Mon. — 13 freehold cottages and 19 a. 1 r. 37 p., f. 519
Penhow, Mon.—Upper Home Farm, 48 a. 2 r. 21 p., f..... 560
Two enclosures, 1 a. 2 r. 10 p., f. 80
Round Wood, 8 a. 3 r. 38 p., f. 180
Four cottages, 5 a. 3 r. 24 p., f. 401
Two gdn. plots and orchard, 0 a. 1 r. 8 p., f. .. 145
Llanvaches, Mon.—Various enclosures, 38 a. 0 r. 3 p., f. 750
Eleven freehold cottages and 17 a. 1 r. 34 p. .. 814
Various enclosures, 19 a. 1 r. 33 p., f. 452
Llanvair Discoed, Mon.—Enclosures of land, 53 a. 2 r. 31 p., f. 445
Bicca Farm, 11 a. 1 r. 15 p., f. 170
Newchurch West, Mon.—Three cottages and 14 a. 1 r. 3 p., f. 405
A stock farm, with ruins of Cas Troggy Castle, 68 a. 0 r. 21 p., f. 800
Enclosure of land, 9 a. 1 r. 5 p., f. 125
Llangwm, Mon.—Enclosures of land, 32 a., f.... 281
Christchurch, Mon.—Frontage land to River Usk, 9 a. 3 r. 7 p., f. 500

By S. & G. KINGSTON (at March).

March, Cambs.—Top Hakes Farm, 163 a. 3 r. 22 p., f..... 5,400
Bottom Hakes Farm, 210 a. 3 r. 2 p., f..... 6,700

May 29.—By DRIVER, JONAS, & Co. (at Newport).

Usk, &c., Mon.—The Manors of Kilgoyan and Usk, with rents, fines, &c. 975
Trelleck, &c., Mon.—The Manors of Trelleck and Trelleck Grange, with rents, fines, &c. 375
Newchurch, &c., Mon.—The Manors of Strignil, otherwise Chepstow, and Port Casey, with rents, fines, &c. 425
Newport, &c., Mon.—The Manors of Newport and Caerleon, with privileges, rights, &c..... 400
Raglan, Mon.—The Manor of Raglan, with rents, fines, &c. 275
Llandilo Crossenny, &c., Mon.—The Manor of Llandilo Crossenny, with ruins of White Castle, with privileges, rights, &c. 500
Usk, Mon.—Impropriate tithes of 129*l.* 16s. 5d... 1,325
Impropriate tithes of 28*l.* 5s. 5d. 310
Grosmont, Mon.—The Manor of Three Castles, with Grosmont Castle, with privileges, rights, &c. £150
Llanishen, Mon.—Impropriate tithes of 96*l.* 11s. 7d. 825
Glascoed, Mon.—Impropriate tithes of 11*l.* 12s. 9d. 130
Dixton, Mon.—Impropriate tithes of 22*l.* 4s. 9d... 230
Newchurch, Mon.—Impropriate tithes of 34*l.*.... 280
Kemeys Inferior, Mon.—Impropriate tithes of 24*l.* 260
Magor, Mon.—Impropriate tithes of 37*l.* 6s. 8d... 450
Redwick, Mon.—Impropriate tithes of 14*l.* 10s. .. 150
Penhow, Mon.—Impropriate tithes of 10*l.* 7s. 110
Llanvaches.—Impropriate tithes of 21*l.* 18s. 2d. .. 235

By SIMMONS & SON (at Whitchurch).

Whitchurch, Hants.—Bere Hill Farm, 224 a. 0 r. 36 p., f., with fishing rights 6,800
Overton, Hants.—Winchester-st., house, shop, three cottages, and paddock, f., y.r. 24*l.* 13s. 4d. 480
Red Lion-lane, five freehold cottages..... 335

By R. DALTON & SON (at Cockermouth).

Embleton, &c., Cumberland.—The Close Estate, 146 a. 2 r. 14 p., f..... 5,000

By BAXTER, PAYNE, & LEPPER (at Bromley).

Bromley, Kent.—High-st., five freehold shop sites 4,230

By S. P. WALTER (at Maidstone).

Marden, Kent.—Underlin Green House and 1 a. 1 r. 2 p. f..... 440

By HUMBERT & FLINT (at Watford).

Harrow.—West-st., four freehold cottages, w.r. 7*2l.* 16s. 1,190
11, 12, 17, and 18, Nelson-rd., f., w.r. 62*l.* 8s. .. 850
Roxeth Lower-rd., 3 cottages, f., w.r. 46*l.* 16s... 690

By H. J. BLISS & SONS.

Forest Gate.—84, Forest-lane, f., y.r. 20*l.* 340
28, and 30, Stracey-rd., f., w.r. 46*l.* 16s. 540
6, Idmiston-rd., f., w.r. 23*l.* 8s. 280
Stratford.—47, 47a and 49, Leytonstone-rd. (S.), f., y.r. 97*l.* 16s. 1,740
Walthamstow.—39 and 41, Chestnut Walk, f., y.r. 50*l.* 905
Leyton.—1 to 7 (odd), Tyndall-rd., u.t. 82½ yrs., g.r. 20*l.*, w.r. 126*l.* 16s. 800
Tottenham.—39 and 40, Nursery-st., u.t. 64 yrs., g.r. 6*l.*, w.r. 37*l.* 14s. 270

By MARK LIELL & SON.

Mile End.—29, Lyall-rd. (S.), u.t. 47½ yrs., g.r. 7*l.*, y.r. 44*l.* 440
Forest Gate.—33, Godwin-rd., f., y.r. 28*l.* 480
77, Claremont-rd., u.t. 80 yrs., g.r. 8*l.* 16s., e.r. 50*l.* 465
Snaresbrook.—New Wanstead, "Dudley Lodge," f., p. 1,040

By STIMSON & SONS.

Walthamstow.—Copeland-rd., f.g.r. 12*l.*, reversion in 80 yrs. 295
Dulwich.—17, Crystal Palace-rd., f., y.r. 28*l.*.... 490
1, Gordon-ter., u.t. 82½ yrs., g.r. 4*l.*, w.r. 26*l.* .. 265
Peckham.—6 and 8, Rosemary-rd., u.t. 38½ yrs., g.r. 5*l.*, y.r. 39*l.* 2s. 305
Camberwell. — 147, New Church-rd., f., w.r. 20*l.* 16s. 245
Stockwell.—9 and 11, Broomgrove-rd., u.t. 78 yrs., g.r. 12*l.*, w.r. 54*l.* 12s. 215
Norwood.—2, Colby-rd., u.t. 64 yrs., g.r. 9*l.*, e.r. 45*l.* 240
Sydenham.—54, Kent House-rd., u.t. 64 yrs., g.r. 4*l.*, e.r. 35*l.* 185

By J. H. GOULD (at Reading).

Reading, Berks.—9, 11, 13, 44, 46, and 48, Somerset-place, and 16, 17, and 18, Warren-pl., u.t. 14 yrs., g.r. nil, w.r. 67*l.* 12s. 105
60 to 66 (even), Soho-st., f., w.r. 52*l.* 530

By W. T. BALLS (at Lowestoft).

Pakefield, &c., Suffolk.—Hubbard's Brick Works, area 27 a. 3 r. 15 p., f., with goodwill 3,750

By W. G. STANSFIELD & Co (at Bradford).

Bradford, Yorks.—Stanbury Moor (moorland), 1,000 acres, f. 9,000
26 and 28, Westgate (S.), f., y.r. 145*l.* 4,000

May 30.—By C. RAWLEY CROSS & Co.

Kensington.—26 and 27, Anley-rd., f., e.r. 80*l.*.... 965
13, Cromwell-gr., u.t. 74 yrs., g.r. 6*l.*, e.r. 55*l.* 520
Hammersmith.—2 and 4, Girdler's-rd., u.t. 63 yrs., g.r., &c., 28*l.* 10s., y.r. 130*l.* 1,100
Acton.—Acacia-rd., a plot of freehold building land 330

By C. W. DAVIES & SON.

Stoke Newington.—59, Park-st., u.t. 66½ yrs., g.r. 5*l.* 5s., e.r. 8*l.* 465
Wandsworth-road.—37 to 53 (odd), Pascal-st., u.t. 6½ yrs., g.r. 54*l.*, w.r. 256*l.* 165
Highbury.—23, Northolme-rd., u.t. 86 yrs., g.r. 8*l.* 10s., e.r. 55*l.* 550
Barnsbury.—4, Everilda-st., u.t. 38 yrs., g.r. 5*l.* 5s., y.r. 34*l.* 250

By DOLMAN & PEARCE.

Haverstock Hill.—No. 121, u.t. 24 yrs., g.r. 20*l.* 14s., subject to lives aged 62 and 52, p... 650

By FURBER, PRICE, & FURBER.

Southwark.—Tabard-st., f.g.r. 10*l.* 10s., reversion in 59 yrs. 250

By JONES, LANG & Co.

Mile End.—Cambridge-rd., the Oxford Arms, b.h., f., y.r. 47*l.* 1,570
1 and 2, Oxford-st., f., w.r. 65*l.* 745
Bethnal Green.—20, Buckhurst-st., c., w.r. 27*l.* 6s. 295
4 and 6, Northampton-st., c., w.r. 67*l.* 12s. 685

By RIDER & SONS.

Kensington.—41 to 47 (odd), Peel-st., f., w.r. 76*l.* 14s. 990
Notting Hill.—9 and 11, Princes-rd., u.t. 38 yrs., g.r. 16*l.*, y.r. 80*l.* 730

By H. W. SMITH.

Stepney.—34 to 52 (even), 35 to 43 (odd) Knott-st., f., w.r. 188*l.* 10s. 2,090

By D. S. STEPHENS.

Manor Park.—476 to 488 (even), High-st., f., w.r. 172*l.* 18s. 1,930
Millwall.—3 to 13 (odd), Havannah-st., u.t. 9 yrs., g.r. 16*l.*, w.r. 96*l.* 4s. £210

By TOWERS, ELLIS, & Co.

Hyde Park.—9, Cambridge-sq., and 4, Norfolk-Mews, u.t. 33½ yrs., g.r. 30*l.*, y.r. 250*l.*..... 2,825
116, Inverness-ter., u.t. 39½ yrs., g.r. 15*l.*, e.r. 130*l.* 1,475
Maida Hill.—46, blomfield-rd., u.t. 39½ yrs., g.r. 10*l.*, e.r. 70*l.* 585

By COOK & BIRMINGHAM (at Exeter).

Kennerleigh, Devon.—The Kennerleigh Manor Estate; also Higher amd Lower Woodbeer Farms, 652 a., f. (in one lot) 9,000

By DREWEATT & WATSON (at Newbury).

Newbury, Berks.—Donnington-rd., Marlborough House, f., p. 2,500
Donnington-rd., freehold building land, 1½ a. .. 500

May 31.—By BRUTON, KNOWLES, & Co. (at Gloucester).

Newent, Glos.—Carswalls Estate, 359 a. 3 r. 15 p., f. 5,000
Edenshill Estate, 98 a. 3 r. 18 p., f. 1,500
Cowmeadow, nine allotments, 10 a. 2 r. 18 p., f. 200
Upleadon, Glos.—Alfords Estate, 23 a. 0 r. 7 p., f. 600

By Messrs. SPELMAN (at Norwich).

Cossey, Norfolk.—Mill House and 4 a. 0 r. 35 p., f. 1,625
Piece of freehold pasture, 1 a. 2 r. 25 p. 140
Cossey Mills and 2 a. 3 r. 24 p., f. and c. 3,000
A small holding, 2 a. 2 r. 22 p., f. and c. 305
Various enclosures, 14 a. 1 r. 3 p., f. 620
Wensum Cottage, 2 cottages, and 1 a. 2 r. 8 p., f. 700
Two cottages and gardens, f. 135

June 2.—By ALLAN BOOTH.

Regent's Park.—105 and 127, Gloucester-rd., u.t. 50 yrs., g.r. 16*l.* 16s., y.r. 95*l.* 1,035
6, Fitzroy-rd., u.t. 49 yrs., g.r. 8*l.* 8s., y.r. 48*l.* 450
Holloway.—36 and 37, Penn-rd. Villas, u.t. 52 yrs., g.r. 19*l.*, y.r. 110*l.* 910
28, Hilldrop-rd., u.t. 60 yrs., g.r. 10*l.*, e.r. 80*l.* 630
56 to 66 (even), Anson-rd., u.t. 74 yrs., g.r. 30s., y.r. 420*l.* 5,000
16, Corporation-st., u.t. 58 yrs., g.r. 7*l.* 10s., e.r. 40*l.* 300
6, Hilldrop-cres., u.t. 46 yrs., g.r. 8*l.*, y.r. 70*l.*.. 600
Kentish Town.—41, Bartholomew-rd., u.t. 56 yrs., g.r. 8*l.*, y.r. 53*l.* 540
22, Clarence-rd., u.t. 28¾ yrs., g.r. 2*l.* 10s., y.r. 30*l.* 275
Broadstairs, Kent.—Crow Hill-rd., Crow Hill Cottage, f., p. 400

By C. BRIDGER & SON.

Liphook, Hants.—Liphook House and 4½ a., f., p. 3,150

By FAREBROTHER, ELLIS, & Co.

Windsor, Berks.—2, West View, u.t. 52½ yrs., g.r. 13*l.* 13s., y.r. 65*l.* 700

By J. HIBBARD & SONS.

Dalston.—51, Shrubland-grove, u.t. 44 yrs., g.r. 5*l.*, y.r. 30*l.* 340
Kennington.—37, Royal-rd., u.t. 19 yrs., g.r. 5*l.*, w.r. 41*l.* 12s. 180

By G. B. HILLIARD & SON.

Burnham-on-Crouch, Essex.—Enclosure of pasture, with sea-wall and foreshore, 7 a. 1 r. 35 p., f. 2,100
Main-st., a copyhold cottage and land 720

By PERCIVAL HODSON.

Camden Town.—63 and 64, Park-st. (S), u.t. 51 yrs., g.r. nil, y.r. 135*l.* 585
Hampstead-rd.—12, Ampthill-sq., u.t. 40¾ yrs., g.r. 12*l.*, y.r. 70*l.* 730
Kentish Town.—12 and 14, Patshull-rd., u.t. 58½ yrs., g.r. 6*l.*, y.r. 98*l.* 1,075
Holloway.—46 Hargrave Park, u.t. 64¼ yrs., g.r. 7*l.*, y.r. 36*l.* 360
45, Hargrave Park, u.t. 50 yrs., g.r. 8*l.* 8s., y.r. 45*l.* 390
68, Hilldrop-cres., u.t. 50¾ yrs., g.r. nil, e.r. 100*l.* 825
24, Hillmarton-rd., u.t. 54 yrs., g.r. 10*l.* 10s., e.r. 65*l.* 550
Notting Hill.—16, 17, and 18, Barandon-st. (S), u.t. 63 yrs., g.r. 25*l.*, y.r. 115*l.* 895
Norwood.—18 and 20, Victoria-rd. u.t. 53 yrs., g.r. 22*l.* 18s., y.r. 120*l.* 780

Messrs. KEMSLEY.

Upminster, Essex.—Main-rd., Freshfields and 1½ a., f., p. 1,235
Buckhurst Hill, Essex.—High-rd., Oakfield and 2 a. 0 r. 33 p., f., p. 4,750

By FRED VARLEY & SON.

Finsbury Park.—482, Seven Sisters-rd., u.t. 63 yrs., g.r. 21*l.*, p. 1,000

By W. N. WILLOUGHBY.

14, Coleridge-rd., u.t. 58 yrs., g.r. 9*l.*, y.r. 45*l.*. 400
Dulwich.—117, Croxted-rd., u.t. 61 yrs., g.r. 5*l.* 1s. 8d., e.r. 60*l.* 800

By T. WOODS.

Sutton, Middx.—Bath-rd., Sutton Cottage and 4¾ acres, f., y.r. 115*l.* 2,000

By PROTHEROE & MORRIS (on Estate).

Kingsdown Cliff, Kent.—Victoria-rd., &c., 112 plots of freehold building land (in lots) 1,351

June 3.—By DEBENHAM, TEWSON, & Co.

King's Cross.—210 to 234 (even), and 234a, Pentonville-rd., and 3 and 5, Winchester-st. (S), area 24,050 ft., f., e.r. 1,134*l.* 14s. 18,000
236, 238, and 240, Pentonville-rd., and 1 to 9 (odd), North-st. (S), area 5,160 ft., f., y.r. 331*l.* 5,250
Camden Town.—211, Camden-rd., u.t. 36½ yrs., g.r. 12*l.*, p. 600
41 and 43, Hampshire-st., u.t. 36½ yrs., g.r. nil, y.r. 82*l.* 500

By BOYTON, PEGRAM, & BUCKMASTER.

Fulham.—15 to 21 (odd), Greyhound-rd., u.t. 75½ yrs., g.r. 18*l.*, w.r. 145*l.* 12s. 700

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Brompton.—Sedlescombe-rd, i.g.r. 60*l.*, u.t. 97 yrs., g.r. 10*l.* £1,125

Battersea.—5 and 9, Boutflower-rd., u.t. 82 yrs., g.r. 19*l.*, y.r. 102*l.* 985

Surbiton, Surrey.—Ravenscar-rd., six plots of building land, f. 234

Cotterell-rd., two plots of building land, f. 132

By FIELD & SONS.

Croydon.—22 to 26, Station-rd. (S), u.t. 65 yrs., g.r. 31*l.* 10s., y.r. 149*l.* 10s. 1,400

By FRANK JOLLY & CO.

Hackney.—Church-path, Poole Villa and Herne Villa, with plot of land in rear, f., y.r. 97*l.* 16s. 1,190

Dalston.—82, Brougham-rd., u.t. 43½ yrs., g.r. 3*l.* 10s., w.r. 37*l.* 14s. 285

By BENJAMIN NORMAN.

Deptford.—172 to 192 (even), Church-st., u.t. 63½ yrs., g.r. 53*l.*, w.r. 335*l.* 8s. 2,060

By RAVENSHEAR & MASSY.

Ealing.—1 to 4, Green-view (S), f., y.r. 165*l.* 3,680

By JOSEPH STOWER.

Finchley.—Fortis Green, Moreton, f., y.r. 85*l.* .. 1,600

Bickley, Kent.—Southborough-rd., two plots of freehold building land 360

June 3.—By WESTON & SONS.

Stockwell.—16, Stansfield-rd., u.t. 68 yrs., g.r. 6*l.* 10s., y.r. 38*l.* 350

Brixton.—3 and 5, Western-rd., u.t. 60 yrs., g.r. 13*l.* 5s., y.r. 80*l.* 700

77, Elm-pk., u.t. 74 yrs., g.r. 5*l.* 10s., y.r. 34*l.* 370

6 and 7, Addison-pl., u.t. 18 yrs., g.r. 1*l.*, w.r. 83*l.* 4s. 350

Strathleven-rd., f.g.r.'s 184*l.*, reversion in 81 yrs. 4,300

Vidal-rd., f.g.r.'s 82*l.* 10s., reversion in 81 yrs. .. 1,930

Kildoran-rd., f.g.r.'s 45*l.* 10s., reversion in 81 yrs. 1 090

Lvham-rd., f.g.r.'s 64*l.*, reversion in 81 yrs. .. 1,530

By F. REBROTHER, ELLIS, & CO.

East Greenwich. — Blackwall-lane, waterside property, with erecting shop, &c., thareon; also 1 and 2, River Bank-cottages, area 4 a. 0 r. 20 p., u.t. 40½ yrs., g r. 50*l.*, p. 7,000

Harrow Weald, Middx.—Southfield Park and 36a. 0r. 1p., f., p. 8,100

Bloomsbury.—Upper St. Martin's-lane, &c., f.g.r. 50*l.*, reversion in 71 yrs. 1,460

11, Little St. Andrew-st., f., y.r. 75*l.* 1,810

7 to 10, Little St. Andrew-st. (S), area 2,060 ft., f., y.r. 240*l.* 6,280

Little St. Andrew-st., The Two Brewers p.-h., f., y.r. 84*l.* 4,000

3 and 4, Little St. Andrew-st. (S), f., y.r. 185*l.* 4,300

1, Little St. Andrew-st. and 20 and 20A, Little Earl-st. (S), area 1,065 ft., y.r. 115*l.* 3,600

21 and 22, Little Earl-st. (S), f., y.r. 160*l.* 4,450

Chiswick.—Rothschild-villas, f.g.r. 4*l.* 10s., reversion in 89 yrs. 110

Pimlico.—68, Ebury-st., u.t. 20¾ yrs., g.r. 7*l.*, y.r. 110*l.* 1,230

By JAMES HARRIS & SON (at Winchester).

Westmeon, Hants.—Court Farm and Marland's Farm, 598 a. 1 r. 24 p., f. (in one lot) 12,000

By DREWEATT & WATSON (at Newbury).

Highclere, Hants.—Freehold house and 3 a. 0 r. 8 p. 335

Freehold house, with outbuildings 220

By HUMBERT & FLINT (at Watford).

Watford, Herts.—211 and 211A, High-st. (S), f., p. 1,100

Clarendon-rd, three freehold building sites 1,549

Bushey, Herts.—Bourne Hall-rd., The Bungalow, f., y.r. 40*l.* 460

46 to 56 (even), Upper Paddock-rd., f., w.r. 69*l.* 11s. 610

Wembley, Middlesex.—Totnes-ter., f.g.r. 7*l.*, reversion in 72½ yrs. 170

By WALTON & LEE (at Buckingham).

Buckingham.—The Castle Fields Estate, 226 a., f. (in lots) 13,395

June 4.—By WYATT & SON (at Chichester).

West Ashling, Sussex.—Skinners Field, 7 a. 2 r. 19 p., f. 310

Enclosures of land, 7 a. 1 r. 20 p., f. 250

East Ashling, Sussex.—Woodend Field, &c., 10 a. 3 r. 7 p., f. 350

Enclosures of land, 47 a 0 r. 33 p., f. 1,410

Three cottages and 1 r. 20 p., f. 110

June 5.—By BROWETT & TAYLOR.

Hackney.—Graham-rd., f.g.r.'s 18*l.*, reversion in 55½ yrs. 515

Ellingfort-rd., f.g.r.'s 52*l.*, reversion in 50 yrs... 1,265

Ellingfort-rd., f.g.r. 46*l.*, reversion in 24 yrs. .. 1,300

Deptford.—Hale-st., f.g.r. 7*l.*, reversion in 17 yrs. 335

Hoxton.—Branch-pl., f.g.r. 10*l.*, reversion in 32 yrs. 235

Islington.—Ball's Pond-rd., f.g.r. 3*l.*, reversion in 18 yrs. 500

By B. BAILEY & CO.

Ilford, Essex.—1, 2, 3, and 16, Queen's-rd., u.t. 999 yrs., g.r. 21*l.*, y.r. 88*l.* 865

By HUMBERT & FLINT.

Abbots Langley, Herts.—Hunton Bridge, freehold building estate, 23 a. 3 r. 11 p. 1,685

Edgware, Middlesex.—High-st. (near), the infant board school premises and plot of land adjoining, f. 725

By C. C. & T. MOORE.

Victoria Park.—Cawley-rd., Inverugie House, u.t. 51½ yrs., g.r. 7*l.*, e.r. 55*l.* 415

Mile End.—16, Commodore-st., u.t. 68 yrs., g.r. nil, w.r 35*l.* 2s. 300

By NEWBON, EDWARDS, & SHEPHARD.

Holloway.—68, 76, 78, and 80, Mercers-rd., u.t. 65 yrs., g.r. 30*l.*, y.r. 178*l.* £2,075

Finsbury Park.—6, 30, and 35, Lancaster-rd., u.t. 74 yrs., g.r. 24*l.*, y.r. 133*l.* 1,350

7, Cornwall-rd., u.t. 74 yrs., g.r. 7*l.* 10s., q.r. 44*l.* 490

16, Connaught-rd., u.t. 74 yrs., g.r. 7*l.* 10s., y.r. 44*l.* 490

Canonbury.—48 and 50, Grosvenor-rd., u.t. 47¾ yrs., g.r. 16*l.* 16s., y.r. 109*l.* 1,000

57, Canonbury-pk. North, u.t. 34 yrs., g.r. 6*l.*, e.r. 60*l.* 500

112, St. Paul's-rd., u.t. 22½ yrs., g.r. 8*l.*, y.r. 8*l.*, y.r. 52*l.* 380

21 and 22, Alma-rd., u.t. 54 yrs., g.r. 8*l.* 10s., y.r. 66*l.* 625

Stoke Newington.—24, Newington-green, f., e.r. 48*l.* 800

Holloway.—66 and 68, Mayton-st., u.t. 58½ yrs., g.r. 10*l.* 10s., y.r. 63*l.* 645

6, Annesley-rd., u.t. 66½ yrs., g.r. 6*l.*, w.r. 52*l.* 235

Islington.—18, Northampton-st., u.t. 16 yrs., g.r. 5*l.*, y.r. 42*l.* 170

351 and 37, Gibson-sq., u.t. 25 yrs., g.r. 11*l.*, y.r. 105*l.* 700

By REYNOLDS & EASON.

Hyde Park.—58, Queen's Gate and 21, Queen's Gate Place Mews, f., p. 6,400

Commercial-rd. East.—32 and 34, Nelson-st., u.t. 8 yrs., g.r. 5*l.*, w.r. 93*l.* 12s. 145

King's Cross.—92, York-rd., u.t. 19 yrs., g.r. 10*l.*, y.r. 65*l.* 225

Dulwich.—19, 23 to 31 (odd), Park-rd., u.t. 62 yrs., g.r., &c., 35*l.* 2s., y.r. 178*l.* 1,260

By STIMSON & SONS.

Blackfriars.—9, Stamford-st. (offices), ., y.r. 75*l.* 1,300

Shoreditch.—3 and 7, Little Essex-st., u.t. 67 yrs., g.r. 9*l.* 10s., y.r. 74*l.* 705

Peckham.—33, Montpelier-rd., u.t. 57 yrs., g.r. 5*l.* 10s., w.r. 44*l.* 4s. 300

72, 74, and 76, Scylla-rd., f., w.r. 93*l.* 12s. 800

32, Tilson-rd., u.t. 60 yrs., g.r. nil, w.r. 41*l.* 12s. 250

Camberwell.—1 to 4, Muscatel-pl., f., w.r. 63*l.* 14s. 455

Old Kent-road.—34 and 36, Peckham Park-rd., u.t. 9 yrs., g.r. 4*l.* 4s., w.r. 80*l.* 12s. 185

Brixton.—22, Canterbury-rd., u.t. 46 yrs., g.r. 10*l.* 10s., y.r. 54*l.* 420

Lambeth.—20, 21, and 22, Murphy-st., u.t. 20 yrs., g r. 75*l.*, w.r. 141*l.* 16s. 240

Norwood.—38, Chestnut-rd., u.t. 68 yrs., g.r. 11*l.*, y.r. 50*l.* 380

By G. TROLLOPE & SONS.

Sutton Courtenay, Berks.—The Abbey and 4 a., f. 4,500

Sutton Field, enclosures of land, 31 a. 1 r. 20 p., f. 1,300

By THOMAS WRIGHT.

Beckenham, Kent.—62, Barnmead-rd., u.t. 73½ yrs., g.r. 5*l.* 15s., y.r. 35*l.* 410

June 6.—By C. GERRETT & CO.

Anerley.—37 to 41 (odd), Piquet-rd., u.t. 97 yrs., g.r. 6*l.*, e.r. 120*l.* 690

By J. W. MORLEY & CO.

City of London.—1, 2, and 3, Meeting House-court (S), f., y.r. 110*l.* 1,700

Turnham Green.—350, 352, 354, and 356, High-rd. (S), y.r. 125*l.*; also l.g.r. 7*l.* 12s., u.t. 14 yrs., g.r. 10*l.* 750

June 6.—By OGDEN, SONS, & OLLEY.

Wimbledon.—Vineyard Hill-rd., Woodford Lodge, f., p. 2,400

By G. W. & H. G. POTTER.

Hampstead.—East Heath, The Pryors and 1¾ a., f., p. 11,550

Kentish Town.—2, Courthope-rd. and 1, Estelle-rd, u.t. 65¾ and 74¾ yrs., g.r. 20*l.*, y.r. 160*l.* 16s. 1,360

By T. B. WESTACOTT.

Camden Town.—22, Eversholt-st., u.t. 41 yrs., g.r. 8*l.*, w.r. 123*l.* 10s. 765

By NORRIS, SON, & HADLEY.

Sevenoaks, Kent.—12, Bayham-rd., u.t. 74 yrs., g.r. 38*l.* 2s. 6d., y.r. 95*l.* 700

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; w.r. for weekly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.			
Hard Stocks	1 11 0	per 1,000	alongside, in river	
Rough Stocks and Grizzles	1 9 0	,,	,,	,,
Facing Stocks	2 12 0	,,	,,	,,
Shippers	2 5 0	,,	,,	,,
Flettons	1 8 0	,,	at railway depôt.	
Red Wire Cuts ..	1 12 0	,,	,,	,,
Best Fareham Red	3 12 0	,,	,,	,,
Best Red Pressed Ruabon Facing.	5 5 0	,,	,,	,,
Best Blue Pressed Staffordshire ..	4 6 6	,,	,,	,,
Do., Bullnose	4 11 0	,,	,,	,,

PRICES CURRENT (*Continued*).

BRICKS, &c.

	£ s. d.			
Best Stourbridge Fire Bricks	4 6 0	per 1,000	at railway depot.	
GLAZED BRICKS				
Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,,	,,
Headers	12 0 0	,,	,,	,,
Quoins, Bullnose, and Flats	17 0 0	,,	,,	,,
Double Stretchers	19 0 0	,,	,,	,,
Double Headers..	16 0 0	,,	,,	,,
One Side and two Ends	19 0 0	,,	,,	,,
Two Sides and one Ends	20 0 0	,,	,,	,,
Splays, Chamfered, Squints.....	20 0 0	,,	,,	,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,,	,,	,,
Quoins, Bullnose, and Flats	14 0 0	,,	,,	,,
Double Stretchers	15 0 0	,,	,,	,,
Double Headers..	14 0 0	,,	,,	,,
One Side and two Ends	15 0 0	,,	,,	,,
Two Sides and one End	15 0 0	,,	,,	,,
Splays, Chamfered, Squints.....	14 0 0	,,	,,	,,
Seconds Quality White and Dipped Salt Glazed....	2 0 0	less than best.		

	s. d.		
Thames and Pit Sand	7 3	per yard, delivered.	
Thames Ballast	6 0	,,	,,
Best Portland Cement	31 0	per ton, delivered.	
Best Ground Blue Lias Lime..	25 0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 10s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.			
Ancaster in blocks	1 11	per ft. cube, deld. rly. depot.		
Bath ,, ...	1 7	,,	,,	
Farleigh Down Bath ..	1 8	,,	,,	
Beer in blocks	1 6	,,	,,	
Grinshill ,, ...	1 10	,,	,,	
Brown Portland in blocks	2 2	,,	,,	
Darley Dale in blocks..	2 4	,,	,,	
Red Corsehill ,,	2 5	,,	,,	
Closeburn Red Freestone	2 3	,,	,,	
Red Mansfield ,,	2 4	,,	,,	
Hard York in blocks ..	2 10	,,	,,	
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt.		
,, ,, 6 in. Rubbed Ditto..	3 0	,,	,,	
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,	
,, ,, 2 in. self-faced Ditto	0 9½	,,	,,	
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube. deld. rly. depôt		
,, ,, ,, 6 in. sawn both sides landings	2 7	per ft. super. deld. rly. depôt.		
,, ,, ,, 3 in. do.	1 2½	,,	,,	

SLATES

in. in.	£ s. d.		
20×10 best blue Bangor..	12 0	per 1000 of 1200 at ry. dep.	
,, best seconds ,,	11 10 0	,,	,,
16× 8 best ,,	6 17 6	,,	,,
20×10 best blue Portmadoc	11 7 6	,,	,,
16×8 best blue Portmadoc	6 5 0	,,	,,
20×10 best Eureka unfading green....	13 10 0	,,	,,
16× 8 ,, ,,	7 10 0	,,	,,
20×10 permanent green	10 10 0	,,	,,
16×8 ,, ,,	6 0 0	,,	,,

TILES.

	s. d.		
Best plain red roofing tiles..41	6	per 1,000, at rly. depôt.	
Hip and valley tiles.... 3	7	per doz.	,, ,,
Best Broseley tiles 48	6	per 1,000	,, ,,
Hip and valley tiles.... 4	0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards) 57	6	per 1,000	,, ,,
Do. ornamental Do. 60	0	,,	,, ,,
Hip tiles 4	0	per doz.	,, ,,
Valley tiles 3		,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) . 50	9	per 1,000	,, ,,
Hip tiles 4	1	per doz.	,, ,,
Valley tiles..... 3	8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	14 10 0	16 0 0
Deals: best 3 by 9.....	13 10 0	15 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	10 10	11 10 0
Battens: best 2½ by 6 and 3 by 6 ...	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in. ...	8 10 0	9 10
2 in. by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0

[*See also page 603.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums	Designs to be delivered
*Southend (Eastern) Church Extension	The Committee	Not stated	Sep. 7
*Memorial to Queen Victoria at Allahabad	The Committee	2,000 Rupees	Nov. 1

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
House, Brigshaw-road, Allerton Bywater	Mr. G. Johnson	A. Hartley, Architect, Castleford	June 12
School, Starbeck, Yorks	.....	T. H. & F. Healey, Architects, 42, Tyrrel-street, Bradford	June 17
*Dwellings for Working Class	St. Pancras Borough Council	Keith D. Young, Architect, 17, Southampton-street, W.C.	do.
Cottages, Margaretting, Essex	.....	R. Mawhood, Architect, 2, Market-road, Chelmsford	do.
Four Houses, Beechwood-avenue, Pontefract	.....	W. Hurst, Architect, Pontefract	do.
Wesleyan Church and Schools, Petersfield	.....	Gordon & Gunton, Architects, Finsbury House, E.C.	do.
Additions to School, Pontyrhyl	Bettws School Board	D. Edmonds, Chapel Bach, near Bridgend	do.
Additions to Schools, Wyndham Row, Cumberland	Great Broughton School Board	W. G. Scott & Co., Architects, Workington	do.
Cast Iron Pipes, Warlingham, Surrey	Lunacy Visiting Committee	E. Mawdesley, Town Hall, Croydon	do.
Road Metal (1,000 tons)	Horsham U.D.C.	S. Mitchell, Council Offices, Horsham	do.
Additions, &c., to School, Cross Keys, Mon.	Risca School Board	E. H. Johnson, Architect, Risca, Mon.	do.
Road Materials	East Grinstead U.D.C.	R. Wilds, surveyor, Urban Council Offices, East Grinstead	June 18
Cemetery Chapels, Stourbridge-road	Dudley Corporation	J. Gammage, Borough Engineer, Town Hall, Dudley	do.
Two Cottages, Plawsworth	North-Eastern Railway Company.	W. Bell, Architect, Central Station, Newcastle-on-Tyne	do.
Banking Premises, Keswick	Carlisle & Cumberland Banking Co.	J. H. Martindale, Architect, Viaduct Chambers, Carlisle	do.
Shops and Warehouse, North-street, Leeds	Mr. J. Pickersgill	T. Winn & Sons, Architects, 92, Albion-street, Leeds	do.
Bridge Works, Hadham Bridge	Hertfordshire County Council	U. A. Smith, County Surveyor, 41, Parliament-street, S.W.	do.
Workhouse Infirmary, Hemsworth, near Wakefield	.....	T. H. Richardson, Architect, Hemsworth	do.
Additions, &c., to Schools, Old Hutton, Kendal	.....	J. Stalker, Architect, Kendal	June 19
Wesleyan Church, Netherfield, near Nottingham	.....	W. J. Morley & Son, Architects, 269, Swan-arcade, Bradford	do.
Extensions to Electricity Works, Valley-road	Bradford Corporation	Mawson & Hudson, Architects, 2, Exchange, Bradford	do.
Public Conveniences, South End Green	Hampstead Borough Council	O. E. Winter, Civil Engineer, Town Hall, Hampstead	do.
*Painting and Repairs, &c., at Infirmary	Fulham Guardians	Clerk, Guardians' Offices, Fulham Palace-road, S.W.	do.
*New Branch Library, West Ealing	Ealing Local Board	Council's Engineer, Town Hall, Ealing	do.
*Making-up Roads	do.	do.	do.
*Engine and Accumulator Rooms, Boiler Settings, &c.	Fulham Guardians	F. H. Medhurst, Engineer, 13, Victoria-street, S.W.	do.
*Public Conveniences, South End Green	Hampstead Borough Council	Borough Engineer, Town Hall, Hampstead, N.W.	do.
Road Metal, Pentre, Glam.	Rhondda U.D.C.	W. J. Jones, Engineer, Pentre, R.S.O.	do.
Granite Spalls (1,500 tons)	Brighton Town Council	F. J. C. May, Civil Engineer, Town Hall, Brighton	June 20
Drainage Works	Banff (N.B.) District Council	J. Barrow, Civil Engineer, 1, Bon Accord-street, Aberdeen	do.
*Supply of Granite Spalls	Brighton Borough Council	Council's Engineer, Town Hall, Brighton	do.
*Supply of Portland Cement	do.	do.	do.
Wesleyan Chapel, Albert-road	Widnes Corporation	C. W. D. Joynson, Architect, Wednesbury	do.
Renovation of Chapel, St. Just, Cornwall	.....	J. C. Maddern, Pendeen	do.
Five Houses, Shaw-street, Halifax	.....	C. F. L. Horsfall & Sons, Architects, Halifax	June 21
Street Works, Clifford-street, &c.	Levenshulme U.D.C.	J. Jepson, Surveyor, Tiviot Dale, Stockport	do.
Street Works, Daisy-street, &c.	Brighouse (Yorks) Corporation	Borough Engineer, Municipal Buildings, Brighouse	do.
Rebuilding Battery House, Portreath, Cornwall	.....	S. Hill, Architect, Green-lane, Redruth	do.
Church, Rendry, Pontardulais Wales	.....	W. Griffiths, Architect, Falcon Chambers, Llanelly	do.
Church, Grimethorpe Colliery, near Cudworth, York.	.....	C. H. Fowler, Architect, Durham	do.
Water Supply Works, Brookeborough	Lisnaskea (Ireland) R.D.C.	J. O'R. Hoey, Council Offices, Lisnaskea	do.
Steel Girder Bridge, near Ninewells Junction	Dundee Town Council	W. C. Mackison, Engineer, 21, Commercial-street, Dundee	do.
Sewerage Works	Pontrefract Town Council	B. Latham, Civil Engineer, Victoria Chambers, S.W.	do.
Extension of Business Premises, Primrose-place	Alloa (N.B.) Co-op. Soc. Ltd	J. Mitchell, Architect, Alloa	do.
Public Baths, Broad-lane, Bramley	Leeds Corporation	J. Lane Fox, Architect, 13, Park-square, Leeds	do.
Schools, Oak-lane	West Bromwich School Board	A. Long, Architect, 21, New-street, West Bromwich	June 20
*Converting Manor House, Lee, into Library	Lewisham Public Libraries Com.	Borough Surveyor, Town Hall, Catford	June 25
Gasworks Extensions	Sowerby Bridge (Yorks) Corprtn.	A. W. Bissell, Engineer, Gasworks, Sowerby Bridge	do.
Extension of Business Premises, Ynishir, Wales	.....	J. Rees, Architect, Pentre	do.
Fifty-eight Houses, Penydarren, Merthyr Tydfil	Brynglas Building Club	T. Roderick, Architect, Merthyr	do.
Flint Road Metal	Burgess Hill (Sussex) U.D.C.	A. F. Hardwick, Council Offices, Burgess Hill	do.
Road Works, Tramway Tracks, &c.	Farnworth U.D.C.	W. J. Lomax, Civil Engineer, 11, Foid-street, Bolton	do.
Tar Paving, &c., Dovercourt	Harwich School Board	G. D. Hugh-Jones, Harwich	do.
Sewerage Works, Reservoir-road, &c.	Kettering U.D.C.	J. Bond, Market-street, Kettering	do.
*Making-up Janet, &c., Roads	County Borough West Ham	Borough Engineer, Town Hall, West Ham, E.	June 24
*Galvanised Corrugated Iron Building, Loughboro' Jun.	London County Council	Architect's Department, 19, Charing Cross-road, S.W.	do.
*Watch Room at Council's Fire Station	Walthamstow U.D.C.	Council's Engineer, Town Hall, Walthamstow	do.
Granite (600 tons)	Braintree U.D.C.	H. H. Nankwell, Surveyor, Vestry Hall, Braintree	June 25
Granite Road Metal	Lewes Town Council	Borough Surveyor, Town Hall, Lewes	do.
*Extension of Town Hall	Southwark Borough Council	Council's Engineer, Vestry Hall, Borough-road, S.E.	do.
Harbour Works, &c., Pwllheli, Carnarvonshire	.....	W. T. Douglas, Engineer, 15, Victoria-street, S.W.	June 30
*Making-up Roads, &c.	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham, N.	July 1
*Broken Granite and Granite Chips	North Walsham U.D.C.	Council's Surveyor, North Walsham	July 2
*Twenty-five Houses in Barge House-road	Metropolitan Borough Woolwich	Borough Engineer, Maxey-road, Plumstead	July 3
*Electric Generating Station	Bexley U.D.C.	Morley & Dawbarn, 82, Victoria-street, S.W.	July 4
*New Coastguard Buildings, near Southminster	The Admiralty	Coastguard Stations, Bradwell and Burnham-on-Crouch	do.
*Cottages for Workmen	Cheshunt U.D.C.	Clerk's Office, Manor House, Cheshunt	July 9
*Drains and Sanitary Works, Newington Workhouse	Southwark Union	G. D. Stevenson, Architect, 13 & 14, King-street, E.C.	July 10
*Convalescent Hospital at Carshalton	Metropolitan Asylums Board	Treadwell & Marten, 2, Waterloo-place, Pall Mall, S.W.	July 16
*Stone Monument	Bucks War Memorial Committee	County Surveyor, County Hall, Aylesbury	July 19
Additions to 15 Houses, Sowerby Bridge, Yorks	.....	J. Crawshaw, Architect, Bradford	No date
*New Church and Schools, Petersfield	.....	W. C. Burley, 6, Station-road, Petersfield	do.
Villa, Sutton-in-Ashfield	.....	J. P. Addington, Architect, Sutton-in-Ashfield	do.
Farmhouse, Wernhir Farm, Little Mill, Mon.	.....	E. J. Williams, Architect, 31, High-street, Cardiff	do.
Two Cottages, Kirkby Mallory, Hinckley	.....	A. W. Byron, 5, Low-pavement, Chesterfield	do.
Villas, Sherwood Rise, Nottingham	.....	Collyer & Slater, Architects, 8, Bridlesmith Gate, Nottingham	do.
Memorial Home, Cranmer-street, Nottingham	Committee	E. K. Sutton, Architect, Bromley House, Nottingham	do.
Two Villas, Pontyclun, Wales	.....	W. Morgan, 11, Bute-crescent, Pontyclun	do.
Club Buildings, Moston, Manchester	.....	S. M. Chadwick, C.E., Bindloss Chmbs., Chapel Walks, Manchester	do.
Auction Yard, &c., Llantwit Major, Wales	.....	E. J. Williams, Architect, 31, High-street, Cardiff	do.
*Construction of Sewer, Talbot-square	J. R. Thomas	Council's Surveyor, Town Hall, Paddington, W.	do.
*Works and repairs to Military Buildings (U.K.)	Paddington Borough Council	General Officer Commanding various Districts	do.
Stables, &c., Abergele, N. Wales	Secretary of State for War	J. Eaton & Co., Architects, Stamford-street, Ashton-under-Lyne	do.
Seven Houses, Allerton Bywater, Yorks	Colonel J. E. Mellor	Garside & Pennington, Architects, Pontefract	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Applications to be in
*Sanitary Inspector	Borough of Hampstead	150*l.*	June 2
*Clerk of Works	Beckenham U.D.C.	3*l.* per week	June 2
*Building Inspector	Willesden District Council	150*l.*	June 2
*Clerk of Works	Hornsey District Council	3*l.* per week	No date

Those marked with an asterisk (*) are advertised in this Number. *Competitions,* lv. *Contracts, pp.* lv. vi. viii. x. & xxii. *Public Appointments,* xix.

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PRICES CURRENT (*Continued*).

WOOD.

BUILDING WOOD—YELLOW.

	At per standard. £ s. d.	£ s. d.
Foreign Sawn Boards—		
1 in. by 12 in.	0 10 0	more than battens.
¾ in.	1 0 0	"
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft.	
	4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks	2 15 0	3 0 0
itch-pine timber (30 ft.)	3 0 0	3 10 0
JOINERS' WOOD.	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
" 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens	10 0 0	11 0 0
White Sea and Petersburg:—		
First white deals, 3 in. by 11 in.	14 0 0	15 0 0
" " " 3 in. by 9 in.	13 0 0	14 0 0
Battens	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
" " " 3 in. by 9 in.	12 0 0	13 0 0
" " " battens	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 1	0 0 0
Yellow Pine—First, regular sizes	32 0 0	33 10 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—Large, per ft. cube	0 2 6	0 3 0
Small " "	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
¼ in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—Per ft. cube	0 3 0	0 3 6
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
1 in. by 7 in. white, planed and shot	0 11	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6

6 in. at 6d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders " "	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London £ s. d.	£ s. d.
IRON—		
Common Bars	7 15 0	8 5 0
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0
Staffordshire "Marked Bars"	10 10 0	- - -
Mild Steel Bars	9 0 0	9 10 0
Hoop Iron, basis price	9 5 0	9 10 0
" " galvanised	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	10 0 0	- - -
" " to 24 g.	12 0 0	- - -
" " to 26 g.	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	12 15 0	- - -
" " 22 g. and 24 g.	13 5 0	- - -
" " 26 g.	14 5 0	- - -
Sheet Iron, Galvanised, flat, best quality:—		
Ordinary sizes to 20 g.	16 0 0	- - -
" " 22 g. and 24 g.	16 10 0	- - -
" " 26 g.	18 0 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
" " 22 g. and 24 g.	13 5 0	- - -
" " 26 g.	14 5 0	- - -

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12 0 0	- - -
" " 22 g. and 24 g.	13 0 0	- - -
" " 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in. (Under 3 in. usual trade extras.)	9 5 0	9 15 0

LEAD, &c.

	Per ton in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 0 0	- - -
Pipe in coils	14 10 0	- - -
Soil Pipe	17 0 0	- - -
ZINC—Sheet—		
Vieille Montagne ton	24 0 0	- - -
Silesian	23 15 0	- - -
COPPER—		
Strong Sheet per lb	0 0 10	- - -
Thin "	0 0 11	- - -
Copper nails "	0 0 11	- - -
BRASS—		
Strong Sheet "	0 0 10	- - -
Thin "	0 0 10½	- - -
TIN—English Ingots "	0 1 5	- - -
SOLDER—Plumbers' "	0 0 7	- - -
Tinmen's "	0 0 9	- - -
Blowpipe "	0 0 10½	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
" fourths	2d. " "
21 oz. thirds	3½d. " "
" fourths	3d. " "
26 oz. thirds	4½d. " "
" fourths	3½d. " "
32 oz. thirds	5½d. " "
" fourths	4½d. " "
Fluted sheet, 15 oz.	3d. " "
" 21 "	4d. " "
⅛ Hartley's Rolled Plate	1⅞d. " "
3/16 " " "	2½d. " "
¼ " " "	2⅝d. " "

OILS, &c.

	£ s. d.
Raw Linseed Oil in pipes or barrels per gallon	0 2 11
" " in drums "	0 3 2
Boiled " " in pipes or barrels "	0 3 1
" " in drums "	0 3 4
Turpentine, in barrels "	0 2 11
" in drums "	0 3 1
Genuine Ground English White Lead per ton	21 0 0
Red Lead, Dry "	20 0 0
Best Linseed Oil Putty per cwt.	0 8 6
Stockholm Tar per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work	0 16 0
Best Elastic Copal Varnish for outside work	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work	0 10 0
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

J. W. B. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

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Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

AUDENSHAW (Lancs).—For the erection of a works chimney for Mr. Joseph Lingard. Messrs. J. H. Burton and J. A. Percival, architects, 150A, Stamford-street, Ashton-under-Lyne:—

H. Fielding	£210 0 0	H. Hurst	£157 10 0
W. Shackley	189 16 7	G. Lund	155 15 3
T. Warrington	180 0 0	Clayton & Sons, Denton*	144 10 0
J. Clayton	176 0 0	Taylor & Sons	135 0 0
Myles & Warner	175 0 0		
Storrs, Sons, & Co., Ltd.	175 0 0		

BARNSLEY.—For the execution of street improvement works, for the Hoyland Nether Urban District Council. Mr. W. Percy Young, Surveyor, Town Hall, Hoyland, near Barnsley. Quantities by the Surveyor:—

M. Grantham	£5,076 1 6	G. Hall	£4,572 10 6
J. Moran	5,011 13 6	I. Hague, Hoyland*	3,609 14 1
Hadfield & Sons	4,935 15 5		

BARNSLEY.—For the execution of tar-paving works for the Hoyland Nether Urban District Council. Mr. W. P. Young, Surveyor, Town Hall, Hoyland, near Barnsley:—

Constable & Co., Ltd., Matlock Bridge, Rotherham* £174 13 6

BARRHEAD (N.B.).—For the erection of municipal buildings for the Town Council. Mr. James Chalmers, architect, 93, Hope-street, Glasgow. Quantities by Messrs. Stirling & Cameron, measurers, 102, Bath-street, Glasgow:—

Masonry.—H. Houston, Barrhead*	£2,069 14 4
Joinery.—W. H. Colquhoun, Barrhead*	1,634 15 10
Slating.—Whyte & Co., Glasgow*	169 0 0
Plastering.—Gray & Sons, Pollokshaws*	227 19 0
Plumbing, &c.—W. Anderson, Barrhead*	344 14 10
Painting.—J. Miller, Barrhead*	101 10 6½

BELPER.—For the reconstruction of a brick culvert, Kirk Langley, for the Rural District Council. Mr. R. C. Cordon, engineer, Hazelwood, Derby:—

Cooper & Son	£188 12 9	A. Cooper	£155 18 9
J. & J. Warner	175 18 8	G. F. Tomlinson	149 14 6
A. Hingley	173 17 8	W. Fletcher	141 11 9
Smith & Sons	167 13 6	G. Cooper, Kirk Langley*	121 1 10
J. Holme	194 17 6		

BELPER.—For the construction of a system of sewers and sewage disposal works, Mapperley, for the Rural District Council. Mr. R. C. Cordon, engineer, Hazelwood, Derby:—

A. Cooper	£640 17 9	A. Hingley	£511 5 0
Cooper & Son	634 10 0	J. Holme	510 10 0
A. Booth	590 10 9	A. Jewell	493 17 10
G. F. Tomlinson	548 0 0	W. Fletcher	491 10 0
J. Coupe, jun.	541 12 3	Cope & Raynor, Nottingham*	489 14 0
Cox & Son	538 1 0		
G. Oldershaw	534 14 2		

BEVERLEY.—For additions, &c., to East Riding Lunatic Asylum, for the Visiting Committee. Mr. C. H Hebblethwaite, architect, 10, Waterhouse-street, Halifax:—

Murgatroyd & Son	£24,780 0 0	A. Lyon	£23,997 0 0
Nicholson & Son	24,488 0 0	T. F. Ullathorne	22,988 3 5
G. Pape	24,475 0 0	J. Constable, Beverley*	22,845 0 0
Potts & Foley	24,075 0 0		

BIRMINGHAM.—For additions to the workhouse, for the Guardians. Mr. W. H. Ward, architect, Paradise-street, Birmingham. Quantities by Messrs. Harris & Harris, Birmingham:—

Nichols	£980	Harley & Son	£835
Hood & Hards	920	Hughes	825
Lowe & Sons	915	Gibbs	825
Crowder	905	Robinson	819
Hopkins	900	Dallow, West Bromwich*	796
Atkinson	864		
Webb	850		

BOSTON (Lincs).—For additions, &c., to fever hospital, Skirbeck, for the Urban District Council. Mr. Jas. Rowell, Architect, Borough Offices, Boston:—

J. W. Pinder	£458 0	Wm. Greenfield	£425 0
Hipwell & Co.	438 0	T. H. Cade	409 10
J. Leafe	427 14	John Lucas, Boston*	390 0

CAERPHILLY.—For additions to church, Aber, for the Committee of the Welsh Baptist Church. Mr. G. A. Lundie, architect, Cardiff:—

J. Williams, Aber, near Caerphilly £514 10

CANNOCK (Staffs).—For the reconstruction of bridge over Mitton Brook, Penkridge, for the Rural District Council. Mr. H. M. Whitehead, surveyor, Penkridge, Stafford. Quantities by the surveyor:—

B. Stacey	£142	F. Sprengen, Penkridge*	£138

CEFN (Wales).—For the erection of house and shop, Well-street, for Mr. Bowen. Mr. J. W. Hughes, architect, Dee Hurst, Llangollen:—

J. T. Jones, Cefn, Ruabon* £525

COVENTRY.—For the erection of a removable floor at the public baths, Priory-street, for the Corporation. Mr. J. E. Swindlehurst, Engineer, St. Mary's Hall, Coventry:—

C. Chamberlain, Coventry £249 10

[*See also next page.*

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GLOUCESTER.—For the execution of roof works, Eastgate Market, for the Corporation. Mr. R. Read, C.E., Guildhall, Gloucester :—

Freeman & Jones	£1,393 10 11
King & Sons	1,348 0 0
J. Gurney	1,311 12 2
Byard & Sons*	1,148 0 0

[All of Gloucester.]

HAYWARDS HEATH (Sussex).—For the supply of granite road metal, and surface flints, for the Cuckfield Urban District Council. Mr. T. Simmons, surveyor, Cuckfield :—

	Per Ton. s. d.
Stoney Stanton Granite Co., near Leicester (granite, 250 tons)	14 9
	Per Yard.
W. Hillman, Portslade-by-Sea (flints, 250 yards)	5 5

[Delivered to Haywards Heath.]

LLANBEDRGOCH (Anglesey). — For new Board school. Mr. Joseph Owen, architect, Menai Bridge :—

J. Hughes	£1,380	T. P. Thomas, Llanfair P.G.*	£888
W. Lewis	1,300	M. Owen	855
O. Thomas	1,077	Jones & Son	845
W. Pritchard	1,040		
J. & R. Evans	922		

LONDON.—For the execution of road works, Blomfield-road, &c., for the Hammersmith Borough Council. Mr. H. Mair, C.E., Town Hall, Broadway, Hammersmith :—

Blomfield-road.

J. Ball	£599 10	Parris & Co, Chesilton-road, S.W.*	£512 0
Nowell & Co.	578 0		
Wimpers & Co.	549 0		
H. J. Greenham	545 0		

Redaw-street.

J. Ball	£332 15 2	Wimpers & Co., Hammersmith*	£277 0 0
Parris & Co.	309 0 0		
Nowell & Co.	308 0 0		
H. J. Greenham	295 0 0		

LONDON.—For decorative and sanitary work, No. 1, Hyde Park-terrace, W. Messrs. Hunter & Hunter, surveyors, South Kensington :—

Douglas	£867 17	Vears & Co.	£826 18
Kinninmont & Sons	852 13	Porter & Co.*	805 2

LONDON.—For the erection of mission institute, Brisbane-street, Camberwell, for the Rev. F. D. Vaughan. Mr. Richard J. Lovell, architect, 46, Queen Victoria-street, E.C. Quantities by Mr. W. H. Webber, 7, Great James-street, W.C. :—

Coles & Co.	£6,676	W. Downes	£6,232
L. H. & R. Roberts	6,422	Bulled & Co.	6,371
Marsland & Co.	6,335	Roome & Co.	5,719
Mardes & Harper	6,254	Ivory*	5,665

NEWCASTLE-ON-TYNE.—For the execution of sewerage and sewage disposal works, Dinnington, for the Castle Ward Rural District Council. Mr. Harry W. Taylor, engineer, Newcastle-on-Tyne and Birmingham :—

J. W. Robson	£2,808	J. Carrick	£1,876
Jacob Robson	2,259	J. Thompson, Gosforth*	1,818
J. Bewley	2,253		
G. K. Waghorn	2,095		

SELKIRK (N.B.).—For constructing intake and gravitating main to engine house, No. 3 Contract, for the Selkirk Corporation. Mr. Harry W. Taylor, engineer, Newcastle-on-Tyne and Birmingham :—

Brebner & Co.	£3,329
MacDonald & Son, Hawick*	2,504
G. K. Waghorn	2,300

STOKE-ON-TRENT.—For the erection of school buildings, Queen-street, Fenton, for the U. D. School Board. Messrs. R. Scrivener & Sons, architects, Hanley :—

P. H. Embrey	£3,843	J. Bagnall	£3,359
S. Wilton, Jnr.	3,509	T. R. Yoxall	3,260
Tompkinson & Bettelley	3,470	Meiklejohn & Son	3,249
Cornes & Sons	3,400	Brain & Smith	3,127
T. Godwin	3,366	S. H. Bennion, Longton*	3,091

WALTHAMSTOW. — For additions, &c., to the Walthamstow Hospital. Messrs. Pennington & Son, architects, Hastings House, Norfolk-street, Strand, W.C. :—

W. R. Rens	£6,970	A. G. Barton	£5,905
Foster Bros.	6,726	J. Appleby	5,800
J. A. Reed	6,273	Snewin Bros.	5,787
S. J. Scott	6,141	W. Shurmur	5,778
Thomas & Edge	6,135	P. Banyard, Cambridge*	5,400
Barrett & Power	6,050	West Bros. & Pettit	5,051
R. A. Lowe	5,995		

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VOL. LXXXII.—No. 3048. JUNE 21, 1902.

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Monument to Daudet, Champs Elysées, Paris ..... M. Saint-Marceaux, Sculptor.
Additions to Charing Cross Hospital: Elevations } Mr. A. Saxon Snell, F.R.I.B.A., Architect.
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Newgate Prison and the City Wall.

ON June 24 the Home Office will return to the Corporation of London the buildings at Newgate which, under the Prisons Act of 1877, had been transferred to the custody of the State, and three years later had ceased to be used as a gaol for punitive purposes, prisoners being confined there only during their trial or condemnation at the Central Criminal Court. The Act 2-3 Vict., c. 56 (1839), provided for separate confinement of prisoners under sentence. In April of the following year was begun the building of the "Model," since known as Pentonville, Prison, having 520 cells, and completed in 1842, at a cost of about 95,000*l.*, after the plans and designs of Lieutenant-Colonel Jebb, R.E. Within five or six years as many as fifty-four prisons were built after that plan at Wakefield, Manchester, Birmingham, Liverpool, Leeds, Dublin, York, and elsewhere; in 1849-52 Holloway Jail was erected, after J. B. Bunning's design, in imitation of Warwick Castle, for 436 cells, at an outlay of nearly 100,000*l.* But it was not until less than fifty years ago that the same system was adopted at Newgate, where may yet be seen one of the wards wherein the prisoners associated together. In 1857-9 a block of 130 cells on three floors for male prisoners was erected, after Bunning's designs, in the area within the high screening wall which encloses the north wing, the Men's Side and formerly the Debtors' Side, of the prison. That block also comprised eleven reception cells, six punishment cells, one of them being a totally-darkened room, and two cells for those sentenced to death. In 1862-3 a similar block of forty-seven cells was built for female prisoners within the south block; and then, in terms of the Act for regulating the place of execution of sentence, a house for the gallows was constructed in the chapel, or men's exercise-yard, at the side of the passage leading from the "condemned" cells.

With the exception of the additional story above the cornice, which has replaced the angle-pediment of the Governor's house, drawn in Fergusson's "History of Architecture" (vol. iii., edit. 1862), the façade, 99 yds. in length, fronting Old Bailey remains as it was designed by the younger Dance, who, at the death of his father on February 11, 1768, succeeded him as City Surveyor, having, as was then customary, purchased that office for 200*l.* His designs, however, did not include the eastern portion of the outer north wall with the adjoining Ordinary's house in Newgate-street. An Act of 7 Geo. III. enabled the Corporation to raise, for various works, sums at 3½ per cent. interest to be repaid by means of a tax of 6d. per ton on coal or culm imported into the City—one sum of 50,000*l.* being appropriated for a new prison and sessions-house; an Act of 18 Geo. III. authorised the raising of 40,000*l.* upon similar terms. Meanwhile, the Parliament had voted a subsidy in aid of 50,000*l.* to the Corporation, who in exchange for the new site gave up to the public a freehold space of 600 square feet in Old Bailey and widened Newgate-street on its south side. Lord Mayor Sir William Beckford laid the first stone on May 31, 1770; in 1778 the Corporation had expended 52,585*l.* 11s. 11d.; they spent 14,464*l.* 13s. 9d. of their own moneys upon the Sessions House, and 6,250*l.* in buying freehold property for the approaches; some unforeseen expenses for the foundations amounted to 19,000*l.*, whilst the injuries done by Lord George Gordon's mob in 1780 involved a further outlay of 30,000*l.* mainly voted by the Commons. Dance designed a substructure of brick arched vaults; in excavating the loose soil he found it necessary to sink the principal foundations to carry the brick vaulting to a depth of 40 ft., by reason of the existence of the town ditch along the outer side of the City wall. He supplied an excellent foundation by mixing cart-loads of whole and broken bricks with mortar, in a ratio of 1 to 4, to form a rough concrete. Behind the new north wing lay the Press Yard, with the "condemned" wards and cells, of the old prison, which were demolished in 1777. The Press Yard, or exercising ground (not to be confounded with the Press Room) stood on the east of the old Stone Hold and the Lower Ward in the Common Felons' Side on the ground floor. The author of the "History of the Press Yard" (1717), who was there amongst the Jacobites of 1715-16, says of it:—

> "This tomb of the living was once 'The Phœnix' Inn by Newgate-street, and being contiguous to the gaol . . . . was added to it in times of the Usurpation" [Commonwealth].

Phœnix-court, in Newgate-street, is but a few yards distant from the site of the City gate, and is now entered through the new premises Nos. 3-5, which are being completed for Messrs. Warner & Son, after designs by Mr. C. Stanley Peach.

A copy of Dance's plan, with elevation, preserved in the "Fauntleroy" copy of Pennant at the Soane Museum, shows the debtors' and the women felons' (and State-prisoners') quadrangles in the north and south wings, respectively, and the men felons' quadrangle, with the arcade beneath the chapel, between the two wings. Around each quadrangle and abutting against the outer walls, are ranged the wards, taprooms, staircases, and closets; on either side of the keeper's house are the turnkeys' lodges (distinguished by the fetters over their portals), and behind the house is the vaulted arcade; the east wall of the north wing stands over the City wall. The re-arrangements effected in 1857-9 involved the removal of the wards—the cells for the refractory and the ward along the east side of the middle quadrangle excepted, the division of the middle area into the women's, middle, and chapel yards, and the extension eastwards of the north wing to include the Ordinary's residence, the ventilating-shaft, and furnace-house, and the sites of the old Press Yard and "condemned" cells. The new block of separated cells in the north wing stands clear for from 12 ft. to 18 ft. 6 in. from the outer walls on three sides; on the west it was entered from Old Bailey through iron doors, that still remain, but have been for some years past disused. The massive outer walls, which form so im-

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posing and impressive a feature of the design, are 50 ft. high, and have a thickness of nearly 4 ft. at the base. The principal wards and rooms of the new prison were arranged in the two wings, and at the rear of the middle block, the wards being from 38 ft. to 24 ft. long by 15 ft. wide. On either side of the Press Yard were two wards for condemned male felons, each of them being 31 ft. by 18 ft., together with three floors of five cells apiece, constructed of stone and vaulted. John Howard, who surveyed the prison in 1779, gives the dimensions of those cells as ranging from 9 ft. to 9 ft. 6 in. by 6 ft. There are some water-colour drawings of them and the chapel, &c., in the "Fauntleroy" copy of Pennant. The buildings were still uncompleted when the "No Popery" rioters attacked the prison on June 7-8, 1780, to liberate their comrades, set fire to it, and set free 300 prisoners.

The middle block of Dance's façade (see Mr. G. J. J. Lacy's measured drawings illustrated in our columns of December 21, 1895) contains the Governor's quarters, the arcade, and the chapel for 350 persons; at the rear are the exercising grounds, and beyond them, forming the eastern portion of the prison, is the ward we have already mentioned. The ward, used as a day-ward for some years past, contains the flogging-block, and is worthy of a passing notice as having been the scene of Mrs. Fry's humane ministrations. The adjoining block, which contained the former "refractory" cells, has been converted into the infirmary, and includes a "condemned" cell for women, with the women warders' rooms on the first floor. The north wing occupies a part of the site of the former prison that stood in the gate of the City wall, and on the south side of Newgate-street. At the side of and beneath the step of the "Debtor's Door," in Old Bailey which, if opened, would admit one into the prison kitchen, may be seen the staples to which the scaffold used to be fastened (1783-1868), and there the pillory was placed. Close by the gallows-shed is a part of the arched doorway and a piece of the wall of one of the wards—their stones are marked by the fire to which they were exposed in June, 1780. A passage along the outside (east) of the women's side, open to the sky, but guarded with an iron grating, forms the communication between the gaol and the courts. It is also the burial place of condemned convicts, whose initials are scratched in the plaster of a wall along the east side of the passage; that wall is a fragment of the old wall of London, whereof there are further fragments to the south, in what is now the west wall of the garden appertaining to the canons' houses at Amen-corner.

In March, 1890, whilst excavating for making a drain at the rear of No. 8, Old Bailey, Mr. J. Terry, clerk of works to the Corporation, dug up another portion of the wall which he found at a shallow depth below the present level of the pavement in that thoroughfare. As we illustrated his drawing of the fragment in our number of November 17, 1900, and on October 20, 1900, printed his account of the discovery, together with analyses we caused to be made of mortar taken from the inner side of the wall, we need say here only that the fragment of the wall, being 8 ft. high and 8 ft. 3 in. thick, had its foundation upon the ballast, and that whilst its inner face had been well preserved, the outer face showed to a marked degree the action of the water of the ditch. The ditch, curiously enough, was known as Houndsditch, according to a passage in Munday's edition of Stow:—

"In the year 1356 . . . . the tenement and ground upon Hounds-ditch, between Lud-gate on the south and New-gate on the north, was appointed to John Cambridge, Chamberlain of London, whereby it seemeth that the Chamberlains of London have there kept their Courts, as they now do at the Guildhall, and till this day the Mayor and Justices of the City kept their Sessions in a part thereof, now called the Sessions Hall, both for the City of London and Shire of Middlesex."

The Sessions House that will shortly be pulled down stands on the south side of the yard, erroneously identified with the former Press Yard, which abuts against the south wing of Newgate. It was rebuilt in 1773-4, by George Dance the younger, and enlarged by William Mountague, City Architect, with an extension southwards on the site of Surgeons' Hall, for offices of the Clerk of the Peace, and, on the ground floor, a vestibule, with a colonnade of Doric pillars in two rows, for witnesses in waiting. Surgeons' Hall, having a frontage of 80 ft. to Old Bailey, had been built in 1745-6 after designs by George Dance the elder, and was demolished in 1809. Bunning made another enlargement eastwards, and sixteen years ago some internal improvements were carried out at a cost of 2,100*l*. The Criminal Court of the earlier building was open to the yard in front, and the yard was divided from the street with a wall capped with a spiked railing, the judges facing westwards. Cole's print of 1754, one of 1727, with others of the Surgeons' Hall and the former Sessions House will be found in the Guildhall and Crace collections. On the floor above the Court was the judges' mess-room, satirised by Pope in a stanza he took from Congreve.

Maitland records that seven statues, one of them representing Liberty with a cat at its feet, were set up in the two fronts of New, formerly Chamberlain, Gate, after its reconstruction as a prison in terms of Sir Richard Whittington's bequest by licence of 1 Henry VI. to his executors. Four of the statues, relics from the fire, stand in niches in the south wing. In order to diminish the evils that arose from over-crowding, debtors were transferred in 1815 to Whitecross-street Prison, and to the Giltspur-street Compter built in 1787-91 from designs and plans by the younger Dance, and pulled down in 1855, when its site was bought by the Governors of Christ Hospital, who used it for the Bluecoat boys' outdoor gymnasium. The plans of George Dance the elder, for rebuilding old Newgate and Giltspur-street prisons, with a new City gate across Newgate-street, are engraved on three sheets and appeared in the *Universal Magazine* of April, 1764. Middle, or Hart's, Row, that stood in the northern opening of Old Bailey, was pulled down in or about the year 1784.

LONDON UNIVERSITY ENGINEERING EXAMINATIONS.

WHEN it became known, some time since, that there was to be a Faculty of Engineering in the London University, and that degrees would be awarded in Engineering, many scientists of the old school thought that such degrees would be easily earned, and would not be of the same calibre as degrees in Science and Arts. But, if we may judge from the syllabus adopted by the Senate outlining the curricula for Internal Students in the Faculty of Engineering, it would seem that degrees in that branch are quite as difficult to obtain as those awarded in connexion with other Faculties.

The scheme adopted was drawn up by the Boards of Civil and Mechanical Engineering and of Electrical Engineering. They had before them to assist them in their work the recommendations of the Boards of Mathematics, Physics, Chemistry, and Geology, with regard to the subjects for the engineering examinations with which these boards were concerned. In the Intermediate examination the following subjects are to be dealt with:—

1. Mathematics: two papers.
2. Applied mathematics and experimental mechanics: one paper and a practical examination.
3. Electricity and magnetism, or heat, sound and optics: one paper and a practical examination.
4. Engineering drawing and design: four hours.
5. One of the following subjects:—Either heat, sound, and optics, or electricity and magnetism (if not taken as a compulsory subject): one paper and a practical examination. Chemistry: one paper and a practical examination. Geology: one paper and a practical examination.

In the syllabus of pure mathematics, algebra, geometry and trigonometry, are dealt with in an advanced manner. The algebra includes the convergency of geometric series, permutations and combinations, the binomial theorem of positive integral indices, the graphs of simple algebraic functions, the theory of indices, the nature and use of logarithms and of logarithmic tables, and interest, and annuities. The geometry includes, amongst other things, the elementary properties of the sphere and plane sections thereof, mensuration of simple solid figures, including the cylinder cone and sphere.

The syllabus of applied mathematics and experimental mechanics includes kinematics and dynamics, treated for the most part in a practical manner. The syllabus of electricity and magnetism provides that students must have a general acquaintance with the apparatus by which the elementary principles of physics are illustrated and applied. In addition, the following subjects are to be considered:—The properties of magnets, simple phenomena of magnetism and of magnetic induction, the magnetic field, the earth as a magnet, the simpler phenomena of electrified bodies, distribution of electrification on conductors, the electric field, and other rather elementary phases of the science. The syllabus of heat, sound, and optics seems to be based on elementary principles only. It is arranged that there shall be a separate examination, theoretical and practical, in the two subjects of electricity and magnetism, and heat, sound, and optics. Also, that at the examination in the latter subject, students be only required to pass in the section of heat, and in either sound or optics.

In engineering drawing and design the syllabus includes making working drawings from sketches, models, or actual parts of

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the details only of any of the following:—Engines, gearing, valves, hand and machine tools, workshop fittings and appliances, hydraulic and electrical machines, and boilers and riveted work generally. Students will be expected to be familiar with the principles of orthographic and oblique projection, and to answer simple questions upon colouring and shading, and upon the arrangement and proportions of such elements of machines as rivets and riveted joints, screw threads, bolts and nuts, flanges and cottered joints, shaft couplings, plummer blocks and brasses, and stuffing-boxes.

The syllabus in chemistry appears to be a rather stiff one—for engineers—and it is difficult to appreciate the object of compelling students to practically learn as much of this science as though they were studying for the science degrees. The curriculum is also ambiguous in many respects. For instance, it is stated that the student must learn the "methods which lead to the discovery of the composition of common materials occurring in Nature." The teacher will have some difficulty in interpreting this part of the syllabus, because it will entirely depend on the indulgence of the examiners as to how much of the methods must be learned by engineering students. If the latter are expected to know as much as though they are to become chemists, then we think this part of the curriculum is altogether overloaded. For the rest of the chemistry, it seems easy enough, and we are glad to notice that no distinction is to be admitted between organic and inorganic chemistry. Especial stress is laid upon the practical work recorded in the students' note-books, and in regard to crystals and the like, specimens made by the student, duly attested by the professor or demonstrator, may be submitted to the examiners.

So far, we have had but few adverse criticisms to offer in regard to the subjects for the Intermediate Examination, but we now come to one which appears to be so crudely framed that nothing we could say would be too strong in condemning it. We refer to the subject of geology as drawn up by the combined boards. We presume the engineers whose names are appended to the syllabus understand something of geology, though none of them are at all conspicuous for original work in that particular science; and we cannot help suspecting that the majority of the members of the boards have been too much influenced by faddism on the part of a very few of their colleagues who do know certain aspects of the science, and are great authorities upon them. The point is, have the engineering boards thoroughly appreciated that there are at least two distinct ways of looking at geology? One deals with the purely theoretical side of the science, and the other deals with the practical applications of it. Let us look at the syllabus and see whether the boards have chosen the most appropriate, for engineers.

In the first place we learn that the boards do not consider the syllabus submitted by the Board of Geology, being that proposed for the Intermediate examination in science, to be suitable for the corresponding examination in engineering. The boards recommend that that part of the Inter. Sci. geology syllabus relating to mineralogy shall be omitted from the engineering curriculum, and that part of the final (B.Sc.) syllabus be inserted in its place. Do the engineering boards quite appreciate what this means? We think not. An examiner dealing with a student who is studying for the engineering examination ought not to possess the power of putting such advanced questions as may be expected to be answered by a student who is attempting his science degree.

We know that there is an attempt to instruct examiners as to the general curricula in practically all the subjects taught in connexion with the university, but we doubt very much whether they will be able to gather from the boards of studies or from the academic council the precise scope of their inquisition. Here is a brief outline of the Geology syllabus. The first part deals with physical geology, which we quite endorse, as it ensures that the student shall possess an elementary knowledge of the general teachings of the science. Next, we find petrology, dealing with the classification and description of rocks, their modes of origin, the changes which they have undergone. The more important relations of rocks one to another are also to be considered. This is all in the right direction, but we do not know how either professors or examiners are to interpret the term "petrology" in this connexion. Is the engineering student expected to know the macro-structure and the micro-structure of all rocks which the pure geologist regards as "important rocks"? If so, then he has as difficult a task before him as his brother student intending to take his science degree. This is not only unfair, but is asking the engineering student to do very much more than he should be required to do in that direction. The study of the common rocks and minerals ought, of course, to be included in the curriculum, and particular stress should be laid on those of special interest to engineers.

The next part of the geology syllabus is ridiculous. The student is expected to know the characters of the principal groups of fossils, chiefly invertebrata, and their distribution in past geological periods. Nobody will complain that engineers should know what a fossil means, but this part of the syllabus is tantamount to expecting students, even in the Intermediate stage to know as much about palæontology as science students who may be making palæontology their special subject. Again, we find that stratigraphical geology of the British Isles, and the fossils characteristic of successive periods have to be learned. That stratigraphy should be well learned by engineers goes without saying, but we do not understand what special value can be attached to so much palæontology. Those who know anything about that science must concede that nobody but a specialist can, with certainty, identify any but the most common fossils, and even that identification ought not to be expected from students of elementary engineering.

In regard to the practical examination, we observe that drawing sections across some simple geological map is required. We should like to see this part extended, and to include the study of hydro-geological and agronomical maps not only of the British Isles but of the Colonies and foreign countries. For, a great deal of really useful geological information conveyed by maps is but very imperfectly understood by engineers. A careful study of them would often lead to the preparation of better schemes for water supply and drainage than is otherwise possible.

Another part of the syllabus refers to the identification and description of simple crystal forms and combinations, by means of models or from actual specimens. Also, the determination of the important rock-forming minerals in hand specimens and in thin sections under the microscope. This part of the curriculum is excellent, but we should have liked a little more specification.

Reviewing the general geology syllabus, we are struck by the absence of any reference to the practical applications of the science. Engineering is eminently a practical subject, but we do not find that the student is to study anything about building stones, road materials, water supply, or the useful minerals, except in so far as the last-mentioned may relate to rock-forming substances, under the head of petrology presumably.

In regard to the Final Examination, the following subjects are put down. Three subjects only are to be selected from:—

1. Theory of machines and machine design.
2. Theory of structures and structural design.
3. Strength and elasticity of materials.
4. Electrical technology.

And at least two subjects must be taken from the following:—

1. Hydraulics.
2. Surveying.
3. Theory of heat engines.
4. Design of electrical machinery and apparatus.
5. General transmission and distribution of electrical energy.
6. Mathematics.
7. Advanced theory of machines and structures.

The Boards do not consider it desirable to include a compulsory paper in mathematics in the final examination, but they recommend that in setting the papers in any of the subjects it be assumed that students possess a knowledge of the differential and integral calculus. There are several other recommendations which have been adopted by the Senate, and which appear to lead to an honest desire to make the attainment of the final degree as difficult as in the other examinations in arts and science.

Whilst we are unable to entirely endorse the curricula, it is certain that the London University is proceeding in the right direction in promoting special degrees for engineering, and in encouraging both the theoretical and the practical aspects of that important branch of knowledge.

NOTES.

The Law of Light.

SOME time ago it was pointed out how difficult it is for practical purposes to lay down any general rule which would make clear an important exception to the general rule that a man may not derogate from his own grant. This exception arises where the facts show that the grantee of the dominant tenement could not reasonably expect to have that tenement free from future obstruction. In the case of Godwin *v.* Schweppes, Ltd., which is reported in the current number of the "Law Reports," an illustration of this exception is to be found. It is unnecessary to follow the several devolutions of the property in question; it is sufficient to say that the plaintiff was the owner of a block of flats, known as Addison Mansions, at Kensington. The land on which

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they were built was part of a piece which was planned out into building plots. Instead of building small tenements, the grantee erected a block of mansions, and did so knowing the character of the adjoining land; there was also a party wall which would not have been erected had not other buildings been contemplated. The Judge held, therefore, that there was no right of light to the block of mansions. When this case is compared with other recent decisions, it becomes clear that whether this important exception is applicable or not must depend entirely on the inference which a reasonable man ought to draw from the circumstances of the particular case. The unfortunate fact is that men cannot always agree on these inferences, and where they disagree it is necessary to obtain the decision of a legal tribunal.

Is a Ladder Scaffolding?

WE recently (May 3) commented on the question, What is a scaffolding within the meaning of the Workmen's Compensation Act?—a question which, despite a decision on the point by the House of Lords and another in the Court of Appeal, still remains in great uncertainty. In the light, however, of the above decisions and of two more cases recently decided in the Court of Appeal, to which we will shortly refer, we think it seems nearly certain that an ordinary ladder used by itself does not fall within the meaning of the word "scaffolding." This point was originally decided so long ago as March, 1899, by the Court of Appeal in the case of "Wood *v.* Walsh," but in the recent case of "Veasey *v.* Chattle," in deciding that a "crawling board" was scaffolding, the Master of the Rolls considered that case inconsistent with the principles laid down by the House of Lords in Hoddinott *v.* Newton Chambers. It is to be observed, however, that, although Lord Justice Mathew agreed with him in holding the crawling board scaffolding, he was in agreement with Lord Justice Stirling in considering Wood *v.* Walsh good law, and a mere ladder not scaffolding. In our recent Note we ventured to suggest that for the erection of scaffolding some combination of materials is necessary, and this seems well illustrated by the two cases decided by the Court of Appeal the week before last. In Marshall *v.* Rudeforth (the *Builder*, p. 598 *ante*) a ladder resting with its foot on the ground leaning against the parapet of a house was held not to be scaffolding; but in Fairey *v.* Rathe, where a ladder standing on the ground had a cross-piece nailed to it, and was resting against a board fastened across the supports of a verandah, this arrangement was held to be a scaffolding.

The Erie Canal.

A BILL now before the Legislature of the United States aims at some important improvements of the Erie Canal between Troy and Cohoes. The scheme of reconstruction is of much smaller scope than that formerly approved by Mr. Roosevelt, but it includes some essential features of the original plan, and the hope of the promoters is to obtain permission at a later date for carrying out the remainder of the work. Two alternative routes are suggested for the construction of a new channel between the Hudson and Mohawk rivers, the levels of these waterways having a difference of 121 ft., which is at the present time overcome by sixteen locks in the existing channel. The most interesting features of the proposed reconstruction are the two parallel flights of three locks each, to be built near Cohoes Falls on the Mohawk river. Each lock is to have a lift of about 40 ft., the main dimensions being:—328 ft. long, 28 ft. wide, and 47 ft. deep. The locks are to be constructed of concrete and stone masonry, and water will be led from lock to lock through arched culverts, 7 ft. high by 5 ft. wide. In connexion with the culverts cast-iron pipes of 2 ft. diameter are to be provided for the admission of water to the lock chambers, suitable regulation being furnished by means of butterfly valves at the end of each culvert. The operation of the lock system may be thus briefly described:—When a vessel has entered the first lock the pair of gates behind it is closed. The culvert valves are then opened, permitting water to gravitate to the second lock until water in the two chambers is at the same level. Then the separating gates are opened, the vessel passes through, and a repetition of the process followed in the first lock takes place. Similar repetitions ultimately lead the vessel through the whole series of chambers to the lower waterway. The lock gates are to be built upon the model so successfully used in the Canadian canals. They will be 47·8 ft. high, and when the locks are full will have to withstand a total pressure of 1,214 tons per pair of gates. It is anticipated that the reconstructions proposed will have the effect of largely increasing the carrying capacity of the canal, and of saving at least a day and a quarter in the time occupied on the journey between Buffalo and New York.

The New East River Bridge Caissons.

BY this time one of the huge caissons intended to form the foundations for the towers of the third East River Bridge, New York, has probably been brought to rest upon the rock bottom of the river. The work of sinking was commenced in March last, and, as the caisson measures some 78 ft. by 144 ft. by 55 ft. 6 in. deep, the progress made has been remarkably rapid. The wall of the structure is formed of 12-in. square timber in two layers, the outer timbers laid horizontally, and the inner vertically, while there is an outer sheath consisting of two layers of 2 in. planks, one fixed diagonally and the other vertically. The planking is caulked to make the caisson watertight, and at the bottom is a steel-plate-cutting edge. About 6 ft. from the bottom a solid timber diaphragm 2 ft. 9 in. thick, forms a roof for the working chamber. Extending to the surface, through a temporary coffer-dam, there are nine material shafts, one elevator shaft, and fourteen 4-in. diameter-pipes for the removal of sand from the workings. Under the old system of building timber caissons, it was usual to make the roof of the chamber of great thickness, but in the present instance the necessary support for the concrete filling is afforded by massive cribwork, stiffened by diagonal trussing. The structure was built at Harlem, and, having been towed down the river, was sunk in position by concrete loading. The work of sinking it to the rock bed has been considerably facilitated by the fact that the material of the river bottom is of almost pure sand, which was readily blown to the surface by compressed air. On completion of sinking operations, the whole interior of the working chamber will be filled with concrete, thus providing a solid pier of concrete and timber from the rocky bed to a height of 37 ft. below mean high water. Upon this a solid masonry pier is to be built, with a base 67 ft. by 134 ft. 6 in. by 60 ft. high. A similar caisson will afterwards be sunk as a foundation for the Manhattan pier of the bridge.

Wireless Telegraphy.

MR. MARCONI gave an interesting and valuable lecture at the Royal Institution last week on wireless telegraphy. The sensational developments which he has made in this branch of electrical engineering have attracted world-wide attention, and so a large and distinguished audience listened to him with the greatest interest. The expert who wants to know the exact arrangements used in the Marconi system may possibly be disappointed by the lecture, yet it is hardly fair to expect descriptions of plant which has barely been tried, and is probably only in the experimental and transition stage. We know that he uses, or is going to use, considerable power at his sending stations, and that alternating current pressure of 30,000 volts with considerable power behind it is required to work some of his apparatus. He stated definitely that his magnetic detector was a great improvement on the filings coherer hitherto employed. The principle of the magnetic detector is not novel, and electricians have been experimenting with it for some years. Curiously enough, in the *Comptes Rendus* for last month M. Branly, the original inventor of the filings coherer, publishes an account of a magnetic detector consisting of a steel tripod with slightly oxidised feet standing on a plate of oxidised steel, which he says acts much better and far more consistently than any of his original coherers. It seems probable, then, that the filings coherer in wireless telegraphy has served its day, and with its disappearance the system becomes far less likely to break down. Mr. Marconi mentioned a phenomenon of great scientific interest which he had noticed in his tests, namely, that whilst readable messages on tape were received up to a distance of 1,550 miles from the Cornwall station during the night time, yet in the day time the signals could not be detected beyond 700 miles. He made the suggestion that this was due to the action of light in discharging the elevated conductor in the same way, we suppose, as ultra violet light discharges a body negatively electrified. If this is the true explanation—and it seems probable—then it could be verified experimentally, and it would be easy to prevent the discharge taking place. Mr. Marconi has proved himself so capable of surmounting great difficulties that we look forward with confidence to the results of his system of signalling between this country and America. In perfecting all the details of his sending and receiving stations, he is leaving nothing to chance, and certainly deserves success.

Drinking Cups in Schools.

DR. L. W. DARRA MAIR'S Report to the Local Government Board upon a prevalence of throat illness in and near the Ditcham Park Estate, Hampshire, contains a point of importance in regard to school furnishing. A great many cases of the disease were in

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houses where the children attended a particular school, and Dr. Mair suggests that one way in which infection may have been communicated was through the use of a common drinking cup. The drinking water at the school was derived from one tap to which was attached an enamelled metal cup. It was said, indeed, and perhaps with truth, that the children living close to the school almost always went to their own homes for drinking water, while those living at a distance had to use the cup or the tap. Be this as it may, there can be no doubt that this water would be used at the meal hours only by those living at a distance. "There can be little doubt, at any rate, that this drinking cup, or even the tap, may well have become infected by the act of drinking, and so have become a factor in the spread of the disease. This drinking cup was destroyed during my visit to the school, and I recommended Mrs. Cave to arrange that in future the use by the children in common of one cup or the tap for drinking should be prevented by providing each child with a drinking cup. Among my other recommendations, dealing with the disinfection of the school and articles in use there, was one advising that all the slates should be thoroughly scoured, and that in future no child should be allowed to use any slate other than one specifically provided for its own use."

Holy Ghost Church, Basingstoke.

A FEW days ago, the Roman Catholic Bishop of Portsmouth laid the first stone of a church to be erected, we read, at the cost of the very Reverend Canon Scoles, and after designs made by him. The church and presbytery are situated near the present Catholic Chapel and the ruins of the Holy Ghost Chapel. The latter chapel stands within the ancient burial-ground or "Liten," and was built in the reign of Henry VIII. by Richard Fox, Bishop of Winchester, and William, Baron Sandys, of The Vyne, near Basingstoke, who had obtained a license for founding a guild under that dedication with a school for the townsfolk. The fraternity, having been dissolved *temp.* Edward VI., was reinstated by his sister Mary. In the course of the Civil War Cromwell suppressed the house, and the Parliament confiscated its revenues; but after the Restoration Dr. Morley, Bishop of Winchester, successfully interceded for a restitution of the endowment to its former uses. In the free grammar school belonging to the foundation Joseph Warton, the poet and critic, and his brother Thomas, the historian of English poetry, had their earlier education during their father's mastership. An account of The Vyne, in the parish of Sherborne St. John, as built by Lord Sandys, who died in 1542, and altered by John Chute in 1754-76, is given in our issue of September 28, 1895. Some of the lock-plates, bearing the initials "W. S.," resemble one at the Holy Ghost chapel.

Hampton House, Middlesex.

THE house, commonly known as Garrick's Villa, by the river-side at Hampton, has been acquired by the London United Tramways Company for the construction of their authorised line to Hampton Court. When David Garrick bought the property he employed Robert Adam to build a new front to the house, and caused the grounds to be laid out under his own directions. In the "Shakespeare temple" at the edge of the lawn Garrick enshrined Roubiliac's statue of the poet, which he bequeathed to his wife for her life, and then to the British Museum, where it stands by the door of the King's Library. That statue, strangely enough, had been overlooked by those concerned in the recent movement for setting up a memorial to Shakespeare in London. Garrick's widow survived her husband many years. At her death the contents of the house were dispersed in 1823. The pictures included some by Zoffany, and Hogarth's four paintings—"The Election"—bought by Sir John Soane for 1,650 guineas. Hogarth published the prints in 1755-8. About forty years ago Garrick Villa was purchased by Mr. Edward Grove, and has since remained in possession of his family.

Unarchitectural Decorations.

SOME of the decorations on street fronts of important buildings, for the Coronation day, seem to be carried out with a disregard for the architectural design of the buildings which is quite lamentable. One of the worst specimens of this kind of Philistinism that we have observed is the treatment of the delicate façade of the Travellers' Club, the work of a great English architect. This has apparently been handed over to a firm of decorators to do just what they like with; and Messrs. Defries's idea (for their name is on the building) of decorating architecture seems to be, not to follow and set off the architectural lines but to obliterate them, by hanging strips of gaudily-coloured stuffs in front of the pediment and architrave mouldings of the windows. We should have thought common sense, to say nothing of good taste, might have suggested that the blank spaces of the wall should have been taken for decoration, instead of obliterating the architectural features. The whole design is in the most tawdry taste, besides that the immense lions' heads are completely out of scale with the building. It will probably satisfy the members of the club, however. The Travellers' is emphatically a "Society" club, and Society people (in London at least) are unfortunately those who care least about art.

CONGRESS OF FRENCH ARCHITECTS.

THE thirtieth session of the Congress of French Architects was opened, at 9.30 on Monday, June 2, in the theatre of the Ecole des Beaux-Arts, under the presidency of M. Moyaux, President of the Société Centrale des Architectes Français, supported by M. Duchâtelet (Paris), M. Newnham (Lille), M. Bourgon (Nancy), M. Etève (Nantes), and MM. George and Rozet, Secretaries of the Société Centrale: about sixty-five persons present.

M. Duchâtelet read, in the name of the Commission de Voirie and of the Société Centrale, a Report on the "Servitude d'Alignement," to which M. Gouault, of the Society of the Seine Inférieure, proposed to append the following resolution, which was put to the vote at the sitting of Saturday, June 7, after discussion; twenty-five voting for it, five against, and twenty not voting:—

"Considérant que les derniers vestiges de la servitude d'alignement, — dite également *non reparandi*,—que l'administration entend faire dériver des règlements en vigueur,—si réduits qu'ils soient en conséquence de la jurisprudence du Conseil d'État et du Ministre de l'Intérieur,—sont encore en contradiction avec les lois constitutionnelles, la déclaration des Droits, l'article 545 du Code civil et les lois d'expropriation;

Considérant qu'aux termes combinés des lois précitées nul ne peut être tenu de céder une parcelle de sa propriété, sans que cette cession ait été ordonnée par une loi déclarative d'utilité publique, et qu'une indemnité juste et préalable ait été consentie aux ayants droit; que si le droit de jouir de la propriété est subordonné à l'observation des règlements, c'est à la condition que ces règlements soient eux-mêmes en conformité avec les principes constitutionnels en vigueur;

Considérant que les dernières traces de la servitude d'alignement tendent chaque jour à disparaître; que l'obstacle que recontre leur disparition immédiate et absolue est constitué principalement par la rigueur de la loi d'expropriation qui autorise le propriétaire des constructions touchées à requérir l'expropriation totale, ce qui a pour effet d'augmenter, dans une proportion considérable, les indemnités locatives;

Considérant qu'il serait désirable qu'une législation nouvelle intervint, plus appropriée aux lois constitutionnelles en cours et aux nécessités inhérentes à l'exécution des travaux publics;

Le Congrès émet le vœu que les pouvoirs publics et le Chambres procèdent à l'étude et à la confection d'une loi qui, tout en reconnaissant l'abrogation absolue de la servitude d'alignement, donnera satisfaction aux intérêts des propriétaires et à l'intérêt général dont l'administration a la garde."

M. Dubuisson (Lille), of the Provincial Society of "Architectes du Nord de France," then read a paper very carefully prepared, but rather out of place, on "La Federation des Architectes Français," recommending the formation of a central committee composed of Presidents of all Architectural Societies numbering more than forty members, the societies which do not amount to that number being invited to become part of the "Association Provinciale des Architectes Français" or to ally themselves with another society in the same district, in order that the proposed committee should be representative of the whole of the French architects. This was discussed, but it is not worth while to follow the discussion, as the proposal did not gain a single vote when put to the Congress on the closing day.

The meeting of Monday morning closed at a quarter before 12, after which about sixty of the congressists, with several lady guests, met at dejeuner at the Hôtel des Sociétés Savantes in Rue Danton, in which for the last two years, the Société Centrale has been installed. Among the artistic attractions of the house are the principal entrance, designed by M. Paul Sédille; the bust of Charles Garnier, by Carpeaux; the marble medallion portrait of Duban, by E. Guillaume; the bronze medallion portrait of Constant Defeux; and a photograph of Sir E. Poynter's portrait of Professor Aitchison, corresponding member of the Société Centrale.

At the second day's meeting on Tuesday, June 3, M. Héron de Villefosse, of the Académie des Inscriptions et Belles Lettres, read a paper on the Grand Altar of Pergamos and its restoration by M. Pontremoli, partly in reference to a bronze medal lately found in France, of which the British Museum possesses the best of three known specimens, and which affords some new light in regard to the restoration of the altar and the sculpture connected with it. M. Fernoux, President of the Société Nationale des Architectes Français, then read a paper developing a proposal for the creation of what he termed "Chambres de Discipline," the object of which should be to ensure or to promote the dignity of the architectural profession in regard to the relations of architects with each other, with their clients, and with contractors and workmen. This rather utopian proposal received little support in discussion, and did not obtain a single vote at the closing meeting, when the resolutions proposed during the congress are put to the final vote. The same fate awaited two other proposals; one by M. Roussel (Cambrai) in favour of "Le Diplome Obligatoire" (practically the same as the registration of architects), which was opposed by MM. Bonner, Roux, Moyaux and Vaillant (all of Paris), and received no support: the other by M. E. Dupuis (Paris), proposing the formation of a committee which should take means to establish a distinction between "architectes capables" and those "qui ne le sont pas."*

M. G. Roget, one of the secretaries, and chairman of the "Economie Sociale" Committee of the Société Centrale, read a remark-

* It is to the credit of the common sense of the Congress generally that such a wild proposal met with no support; but we cannot help thinking that some French architects must be a little 'off their heads,' on reading the report of such a proposal. We remember nothing so preposterous as this proposal, and that of the "Chambre de Discipline," in the proceedings of any previous Congress.—ED.

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able paper on the subject "Architects, Employees, and the Law of 1898 on Accidents to Workmen." Speaking in the name of the Société Centrale, the Caisse de Défense Mutuelle, the Association Provinciale, and the Société des Architectes Diplomés, the reader of the paper objected to architects being called on to pay a kind of special impost towards a fund for indemnifying injured workmen, but protested still more strongly against placing architects who employed clerks, pupils, draughtsmen, "vérificateurs" &c., in the same position as contractors employing labourers. M. Chas. Lucas then read a form of protest, drawn up by M. Gosset, President of the Order of Advocates of the Conseil d'Etat, which was to be addressed to the Prefect on this subject, and which the Caisse de Défense Mutuelle undertook to support.

The third sitting of the Congress was held in the theatre of the Ecole des Beaux-Arts at 9.30 a.m. on Wednesday the 4th under the presidency of M. Moyaux. M. G. Olive, Secretary of the Société Centrale, read a very scientific paper on the subject of the damage to woodwork by *merulius lacrymans* (dry-rot). M. Lalanne followed with a paper on the ravages of a wood parasite, "la vrillette." The paper partly turned on the judicial aspect of the matter, and the manner in which certain Courts have endeavoured to fix responsibility on the architects for these diseases which timber is heir to, and led to the proposing of the following resolution :—

"Considering that it is materially impossible to discover, in apparently sound wood, the presence of the eggs of *vrillettes* or of the spores which may engender *merulius*, and also that these evils may be brought into timber by external agencies, the Congress is of opinion that the responsibility of the architect cannot be affirmed in these cases."*

This resolution was unanimously adopted in the Saturday's voting. M. Olive's paper was illustrated by drawings showing the various states of timber attacked by these parasites.

The third sitting was concluded by a paper from M. Chas. Lucas on the subject of copyright in architectural designs ("Propriété des Œuvres d'Architecture") from 1793 to the present time. The law of July 1793 protected the works of authors, musical composers, painters, and designers. The law of March 1902 has placed architects and sculptors under the same protection. M. Lucas has had much influence in bringing about this result, by taking every opportunity to urge the subject on the consideration of jurists and legislators, and was thanked by the President for his efforts in this direction for twenty-five years back.

The morning of Friday, June 6, had been reserved for the annual meeting of the "Caisse de Défense Mutuelle." The meeting on this occasion, presided over by M. Moyaux, was almost entirely occupied by the reading of the Administrative Committee's Report on the year's operations. The "Caisse" consists at the present moment of twenty-four members in Paris and 284 in the provinces, and twenty-seven architectural societies have official connexion with it. During the past year the "Caisse" gave its assistance to architects, by advice and funds, in fifty-three cases, eight which had been under consideration before, and forty-five new ones. It has also published two new memoranda in regard to architectural jurisprudence, one on "Propriété Artistique des Œuvres d'Architecture," by M. Maurice Tassin ; the other on "Les Honoraires des Architectes," by M. Georges Harmand.

On Saturday, June 7, the closing meeting of the Congress was held at 9 a.m. at the Ecole des Beaux-Arts, M. Moyaux presiding ; when M. Henri Saladin, an architect who has been fulfilling various Government missions in Tunis, read a paper on "A Family of Tunisian Architects from the Seventeenth Century to the Present Day," and on the buildings built or restored by them. Subsequently M. C. A. Gautier read a sympathetic memoir of the late M. Coquart.

A scheme for the revision of the system of fees to architectural experts was presented, in the name of the Committee which had drawn it up, by M. Gouault. The Committee's suggestions were unanimously adopted by the Congress, and ordered to be transmitted to the secretary of a special Committee appointed by the Minister of Justice.

At one p.m., in the Hemicycle of the Ecole des Beaux-Arts, took place the annual distribution of "Récompenses" awarded by the Société Centrale des Architectes." Among the awards of medals to architects that were most applauded were those to MM. J. Pellechet, C. Plumet, C. Breffendille, C. Bourgon (of Nancy), and Marcel Auburtin. As usual, a number of medals were distributed also to contractors, clerks, and artisans connected with building work.

The dinner in the evening at the Hôtel Continental was presided over by M. Roujon, the Director of the Department of Fine Arts.

Although this dinner formally concluded the Congress, the expedition the following Sunday morning to Ribemont, to see the inauguration of the bust in memory of François Blondel, was almost in the nature of an addition to the Congress programme. Blondel was architect of the Porte St. Denis, and the first Director of the Academy of Architecture, and the bust and pedestal to his memory were unveiled in the presence of a considerable and enthusiastic gathering of French architects.

VISITS TO BUILDINGS.

To our readers perhaps the visits paid by the members of the Congress to various buildings form the most interesting portion of the proceedings, for the list included some not hitherto much known or described.

The first visit was paid on Tuesday, June 3, to M. Chedanne's vast building called the Palace Hotel.

It stands on the left of the Avenue des Champs Elysées, as one goes towards L'Etoile. It was not without regret that many who knew the place well saw the disappearance of the comparatively modest buildings formerly on the site, to make way for this huge façade. The modern buildings bordering the Champs Elysées Avenue are, in fact, too lofty for their situation, and spoil the general proportion of the vista. Apart from this consideration, there is nothing but praise for M. Chedanne's building, and for the manner in which the decorative details have been carried out by M. Hippolyte Lefebvre, with the assistance of MM. Capellaro, Baralis, and Gasque. M. Jacques Galland has painted the ceiling of the entrance-hall, the vault of which is decorated by bas-reliefs by MM. Gasq, Boutry, Sicard, and Peynot. The salle-à-manger has been decorated by no less an artist than M. Gervais, with paintings representing the "Judgment of Paris," "Bacchus," and "L'Amour." Adjoining the vestibule are two rooms, the ceiling of one of which is painted by M. Rondel, with "The Hours of Day and Night," and the other by M. Marioton, the French ceiling painter *par excellence*. The furniture has been supplied from London by Messrs. Maple & Co., who seem to have been fortunate in obtaining much approval in Paris for their work.

The members next visited the manufactory at Sèvres, of which it is unnecessary to say more here, and thence repaired to Issy to see the chapel of the Catholic Seminary, which occupies the site of the former château of Marguerite de Valois. The building, designed by M. Bérard, is in the pompous but frigid style of Louis XIV., with a nave surrounded by a colonnade in grey marble. The day was concluded by a hasty visit to some new houses in Rue de la Convention and Rue de Monsieur.

A visit was also paid to the works for the enlargement of the Crédit Lyonnais, under direction of M. Bouwens van der Boyen. This bank had a modest beginning, in 1878, in a building facing the Boulevard des Italiens, at the angle of Rue de Choiseul. It now occupies nearly the whole space enclosed by the Boulevard, the Rue de Choiseul, and the Rue de Grammont, and no doubt will ultimately extend, with another façade, to the Rue du Quatre Septembre. The plan, owing to the angles at which the streets lie, is irregular, and in order to mask the difference of angle between two portions of the façade the architect has introduced a large central vestibule circular on plan, a kind of inner court, with an order of Doric columns on the ground story and a Corinthian order above, the whole covered by a glass dome. Around it is a fine staircase, rather recalling that of the Château of Chambord. The business rooms are admirably adapted for their purpose. The whole additions have cost about twelve million francs, of which three millions have been expended on the strong-rooms.

On Wednesday, June 4, the members paid a visit to the memorial chapel in the Rue Goujon, which has already been fully described and illustrated in the *Builder*. From this building to the barracks of the Sapeurs-Pompiers at Montmartre was a curious transition, though there is a certain kind of relation between a building erected as a memorial of a fire and one erected for those whose duty it is to extinguish fires. The building is by M. Héneux, whose plans were selected in a competition in 1896. On the ground floor are stores for *matériel*, stables, offices, and gymnasium. The principal façade, towards Rue Carpeaux, has been treated with a certain degree of architectural richness, in the praiseworthy effort to import a little decoration into one of the most squalid quarters of Paris. It is in the style of Louis XIII., and built in brick with stone dressings. The members subsequently paid a visit to the new offices of *L'Illustration*, in Rue St. Georges and Rue de la Victoire. This building was commenced in 1901, from the plans of M. Yvon. It has been almost entirely carried out in "ciment armé" (steel enclosed in concrete), and contains a basement for machines and printing-presses, and two stories devoted to the requirements of compositors, readers, photographers, &c.

An excursion to Sens and to Villeneuve-sur-Yonne occupied the whole of Thursday, June 5, those who joined it starting at 6.30 in the morning. Sens cathedral need not be specially described here. The church at Villeneuve-sur-Yonne dates from the twelfth and thirteenth centuries, and visitors were also able to inspect a "beau donjon" of the twelfth century, and two city gates built in 1170. The members returned to dinner at Sens, and arrived in Paris again at midnight.

The final series of visits commenced, on Friday, June 6, with the Caserne des Celestins, completed in 1898 by M. Jacques Hermant, whose designs were selected in a competition. The building stands on the site of the old Caserne Sully ; it covers an extent of 18,854 square mètres, and has cost 4,355,000 francs. The façade towards the Boulevard Henri IV. has an imposing appearance ; built mainly in brick, it is decorated with great carved trophies in stone. The great gateway, with a fine wrought-iron gate, is ornamented with two bas-relief figures by M. Allar. The buildings towards the inner court, though extremely simple, have a fine general effect.

The new buffet of the Gare de Lyon, which was next visited, is one of the modern curiosities of Paris. It was opened, last year, by the President of the Republic, and occupies the first story of the principal façade. It is reached from the station by a fine staircase, and consists of two great saloons ornamented with decorative panels, sculptured figures, and the armorial bearings of the principal towns on the Paris and Mediterranean railway system. The first saloon, in which green is the prevailing colour, is decorated with three allegorical ceiling paintings. In the centre the subject is Paris, by M. Flameny ; on the left, Marseilles, by M Saint-Pierre ; on the right Lyons, by M. Dubufe. At one end are landscapes painted by M. Decanis, representing Cannes and Mentone ; at the other end, in similar arrangement, views of Villefranche and Monaco, by M. Montenard. Between the windows are three landscapes ; the lake of Annecy, by M. Cachoud ; the Quai de l'Institut, by M. Billotte ; and the port of Toulon, by M. Dauphin. The two vestibules on either side of the first saloon are also adorned with sculptures and wall paintings. In the second saloon old gold is the prevailing tone, and the ceiling is decorated with two paintings—the "Bataille des Fleurs" at Nice, by M. Gervais, and the vintage at Bourgogne, by M. Albert Maignan. The landscapes on either side of the doors are, at one end, the port of Marseilles and St. Honorat, by M Olivier, and at the other end, Le Puy, by M. Petitjean, and the lake of Aiguebelles, by M. Carl Rosa. The two side walls are also decorated, as in the other saloon, with landscapes by various eminent painters. In fact, the Gare de Lyons refreshment rooms form quite a museum of some of the best contemporary French art.

Not far from the station is the generating electric depôt of the Metropolitan Railway, which was also visited. This building, of which M. Friesé was the architect, stands between the Rue de Bercy and the Quai de la Rapée, in which street are the principal

* Our readers will remember that, by the French law, an architect is held legally responsible for any failure in a building carried out under his superintendence.

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administration offices, connected with the factory by a footbridge. The factory is divided into two main blocks, one containing the engines, the other the electric batteries. The exterior façade, though plain and simple as befits a building of this class, has been very carefully studied by the architect, and, without any useless or inappropriate ornament, has nevertheless a fine effect, and is by no means so depressing in appearance as is too often the case with machinery buildings, in the north of France especially.

ARCHITECTURAL ASSOCIATION SUMMER VISITS:

SHIPLAKE COURT, HENLEY-ON-THAMES.

THE second summer visit was made on Saturday, the 14th, to the above well-known country house, designed by Mr. Ernest George some fourteen years ago. The depressing climatic conditions probably accounted for the small number of members who met at Paddington, but those who went were amply rewarded for their trouble, and, as the rain was good enough to cease during the afternoon, full advantage was taken of Mr. and Mrs. Harrison's kindness in permitting the Association to visit their home—

"Along the shore of silver streaming Thames."

Shiplake Court stands on a beautifully-wooded slope stretching down to the river, and all the buildings, lodge, stable, and house, have weathered and toned down in perfect keeping with the surroundings, so that one was enabled to appreciate to the full all the subtleties of design and the texture, value, and colour of the materials employed in their ripe maturity, and not as one too often sees them, in the stark nakedness of infancy.

Although much is due to these materials themselves, Gloucestershire stone slates, Lawrence's bricks, with a generous use of oak for frames, mullions, and sills, set off on the river front by a flint and brick basement storey and a wide stone-flagged and balustraded terrace, the whole surrounded by a beautiful garden, it is the quiet restraint of the design which makes the charm complete, and this was perhaps the more apparent in the servants' wing, which is simpler in treatment than the rest and was generally the more admired. The use of grey headers diapered in with the brickwork has given a nice feeling of texture generally to the elevations. One point worthy of mention is that the Bath stone used for the windows of the hall, the columns to the loggias, and the terrace balustrading was originally treated with some solution of copper which has given it a most delightful rich yellow, more akin in colour to Ham Hill stone, and this has certainly contributed to the happy effects of time and weather, and entirely done away with the textureless appearance which Bath stone usually retains for so long.

Internally the chief feature of the house is the fine "hall," with its open-timbered roof, long stone mullioned windows, and carved oak screen with a gallery above, the general effect being much enhanced by the tapestries, hangings, and furniture; in fact, the whole house is a storehouse of beautiful things.

This hall, on the river front, with the entrance hall and staircase beside it, but facing the opposite way, occupy the centre of the house, Mr. Harrison's room, the morning-room, and library being on the right, and the dining-room, billiard-room, and offices on the left. The rooms, with the exception of the big hall, are low, and in some cases, especially the outer hall, a trifle dark in comparison with the more drastic demands of the present day for light and air; but the treatment of the plan by which rooms used in the daytime take every advantage of the site was particularly noticed, and forms a striking contrast to many old English houses, where this point seems often to have been completely overlooked.

The bedrooms are all well lighted and airy, and an open but covered sitting place on the first floor, with an oak-balustraded balcony, formed a charming and somewhat unusual feature.

The oak sills, frames, and mullions have rather suffered from sun and rain, and must, in course of time, lead to trouble from wet working in, which detracts a little from the beautiful effect obtained externally from the silver-grey colour which the oak has everywhere become.

The garden, too, alone was worth seeing, but one noted with regret the over-use of bedding-out plants, instead of the more homely perennials, which, no matter where one meets with them, always seem like old friends.

The stables and water tower made an effective group by themselves, and the ample lighting of the former was a point to be noted.

The entrance lodge also is a perfect little building, a brick ground floor story surmounted by oak half-timbered work filled in with rough-cast, the face of the solid oak beams and window-frames being sunk back with a fretwork pattern in relief; the roof of stone slates, smaller in size than those on the house, but not quite such a good colour, coupled with a characteristic chimney stack, the whole being harmoniously toned by time and weather.

Some of the party inspected the cottages on the estate, while others walked to Henley and paid an impromptu visit to Mr. H. T. Hare's new town hall, which the caretaker was evidently enthusiastically pleased to show them.

The building occupies a sloping but fine site in the centre of the town, and is oblong on plan, which is a most straightforward and admirable one.

The main entrance is at the eastern or lower end. A few steps on either side lead up to the ground floor level, and thence Hopton Wood stone stairs lead to the assembly-room on the first floor. This room seats about 500 people, and has a coved plaster ceiling, being well lighted by windows on either side and by a series of lunettes from dormers in the roof, the circular openings to these in the coved ceiling having a very pleasing effect. There are three doorways at the east end, while at the opposite end is a recessed alcoved stage with a semi-circular arched ceiling. Special exit doors on either side of this communicate with stairs at this end of the building.

The council chamber, mayor's parlour, and committee-rooms are on the ground floor with access from each end of the building. The panelling in the council chamber is of oak in wide panels, a particularly nice feature being made of the fireplace.

In the basement are offices and a drill-room, heating apparatus, &c. The caretaker's rooms are at the west end.

Externally the materials used are red brick with Bath stone dressings to the windows, &c., and a grey green stone slate roof. The detail throughout is quiet and thoughtful, and the whole building is so simple and well proportioned, besides being excellently lighted and planned, that it made a most interesting finish to a well-spent afternoon.

SOME MINOR EXHIBITIONS.

AN unusual number of small art exhibitions have been open during the last week or two.

In regard to real artistic interest perhaps the first place should be given to the so-called "Coronation Exhibition" at the Goupil Gallery as it is still called, though now owned by Messrs. W. Marchant & Co. The title merely signifies that it is an exhibition opened as an attraction at the Coronation period; the contents bear no reference to any standard but that of art. The Goupil Gallery has for some time past been especially the home of the type of painting, partly represented by the modern Dutch school, which aims at breadth of effect and a certain special treatment of colour (or no colour, sometimes) rather than at finished representations of fact. Sometimes this "breadth," and this disdain of mere prettiness, is carried too far, and results in pictures that look as if they were painted with mud scrapings off the road, or in mere splashes of formless colour like those of an amateur who is the fashion at present. But we seldom go to the Goupil Gallery without finding something to carry away in the memory. In this case there are a number of small landscapes, some of them bearing great names, most of which are of no little beauty. A small work by M. Harpignies, "Le Ruisseau," shows the best qualities of this painter of abstract landscape, as one may call it; there are several other examples of his work, of which the best is the small picture called "Road near Morlaix" (47). There are not only some very characteristic sketches and studies by the late M. Cazin, but also a finished and most beautiful and delicate landscape by the deceased artist, "On the Top of the Cliff" (27), a view over a seaside hamlet and on to the sea beyond. As an example of style this, like many of Cazin's works, is perfect; it represents breadth and aërial effect without the slightest suspicion of crudity or roughness in execution. Among other of the smaller landscapes may be named M. Lépine's beautiful little "Moonlight" (17), a scene on a Dutch canal; Mr. Priestman's "Yarmouth Harbour" (9)—the same painter's "Coming Storm" (16) is spoiled by the sea, which is carelessly painted and looks more like mud; M. Maris's small study, "The White Cow" (32); Mr. Weiss's "Amberley Church" (52), remarkable for force of colour and the strong daylight on the churchyard grass; and several subjects, mostly architectural, by an artist new to us, M. Mathews, who paints architecture with considerable force and effect. But one of the most noteworthy things in the collection is what one at once takes to be a large landscape by Diaz—much larger than usual; reference to the catalogue shows that it is by M. Visconti, also a name new to us, and who has made an obviously intentional and really very successful effort to reproduce Diaz's peculiar style and effect. He must have studied Diaz's work with a magnifying-glass, one would suppose, to have arrived at that degree of similitude in the trunks of the larger trees. Of course, an imitated style, however well done, is not worth the original, but this is a rather remarkable example of successful imitation.

The Pastel Society are holding their fourth exhibition at the galleries of the Royal Institute of Painters in Piccadilly. What one looks for in a pastel exhibition is the kind of subjects and treatment to which pastel best lends itself; the study of special effects of composition and light in landscape for instance, not the attempt to make finished pictures; the study of line and composition in figure subjects. Mr. Pennell perhaps intends to illustrate this in his curious study called "London" (36), but the reduction of London to a study in blue and yellow hardly commends itself to us, and the drawing of Waterloo Bridge does no justice to that erection. Bridges in general suffer much at the hands of painters. Mr. Partridge's study of S. Maria della Salute by Moonlight (32) is more to the purpose, and gives an indication of a celebrated building under an unfamiliar aspect. Mr. Melton Fisher also has a good study of the same building; but, generally speaking, architecture is not a subject for pastel. More to the purpose are such works as M. Padgett's "Marshlands" (55), Mr. Austen Brown's "To the Fold" (25), Mr. Edward Stott's "Harvest Moon" (7), seen over the shoulder of a reaped field; M. Elias's "Calves at a Pool" (68); Mr. Hennessy's "The Winter Evening" (77), looking along a frozen river with two figures skating; and Mr. Grosvenor Thomas's "Spring" (122). In the matter of figure studies Mrs. Sutro makes a success with her large figure of "La Parisienne" (88) bending over a pier-glass, and clad in a brown dress with a bright yellow sash, a kind of combination which pastel brings out effectively. Mr. Clausen has a good study of "A Mower" (5); Mr. Byam Shaw exhibits a powerful portrait of Miss Fortescue-Brickdale; and Lady Sassoon's profile head of "Francesca da Rimini" (153) is a clever attempt to realise the probable style of an Italian belle of the period.

In the same gallery is the "British Colonial Art Exhibition"; not a very large one; whether representative or not one cannot say, but if so, it does not convey the impression that Colonial art has got very far. Mr. Lund's large picture of London, "The Heart of the Empire," is effective, and there are some interesting bits of Australian scenery among the landscapes.

A collection of bronzes at 10, Ryder-street, St. James's, seems to have been made chiefly to show the work of that clever and original sculptor Mr. Taubman; a few not very important works by the Countess Gleichen being, as it were, thrown in, perhaps under the idea that the name would attract those who were not familiar with Mr. Taubman's work. The latter is full of originality, with sometimes a suspicion of eccentricity, and we should be rather afraid that the sculptor is getting under the not artistically healthy influence of M. Rodin. "Love's Derelicts," however, is a really fine and sculpturesque work; the large head of "Night" is fine and poetic; the two heads of a man and woman giving vent to their feelings in a passionate kiss, "After Long

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Tribulation" is a work of great power and expression. In his "Design for a Spoon" the sculptor uses two figures, a man carrying a woman in his arms, to form the handle of the spoon; a misuse of the figure, to our thinking, though no doubt there is plenty of Renaissance precedent for it.

The exhibitions at the French Gallery (what used to be called the "French and Flemish Gallery") at 120, Pall Mall, are, we are glad to see reviving. The present exhibition contains a good many excellent works, some of living artists, some of artists who are dead. Among others is a very fine little work by Millet, "Mother and Child," a mother carrying her child along a hill road; a fine composition in Millet's best (later) manner. A large Corot, which we seem to know, under the title "Don Quixote," is a landscape with a mass of foreground trees not quite in Corot's best style, but a noble and most effective composition of distance and middle distance. Harpignies, Dupré, and Detaille, are among other famous French names represented; also one of Professor Muller's characteristic Arab scenes, in which figures and architecture are treated with equal power. We regret to find that Heffuer's hard pictures, with their steel watersurfaces, continue to haunt this gallery; we could well spare them; but otherwise it is a very interesting exhibition.

We fear we cannot say the same of the Dudley Gallery Art Society's thirty-eighth summer exhibition of water-colours, now open. There are a great many of what may be called adequately executed water-colour drawings; it is surprising, indeed, what a number of people there are nowadays who have attained to a certain point of finish and capability in the execution of water-colour pictures; but something more than merely competent handicraft is required to make an interesting exhibition. One passes drawing after drawing with which no particular fault can be found, but which have also no particular excellence and (which is perhaps more important) no special characteristics of style; each one seems as if any one else, equally trained, might have produced it. The most interesting works are generally some of sketches, such as Miss Bernard's "Fleetlands, Newtown" (170), and some others. Mr. Sylvester Stannard's large work "The Storm" (227), if perhaps a little theatrical in effect, is nevertheless a work of considerable power. Mr. F. Coleridge exhibits a good little landscape "A Harvest Field" (226), and Mr. George Marks several small drawings, which are beautiful, especially the three on the screen, and among those we more particularly point out the one entitled "At Eventide" (313). These are small landscapes which are highly studied and finished without being in the least hard or overworked; they are fine in texture feeling and colour. Mr. Newton Benett's "Bridgenorth Town" (16) and "Tewkesbury Abbey" (127) are also admirable and carefully-studied works. Mr. Severin Kröyer, a new name to us, exhibits two good figure subjects (147 and 163); and among others worth special notice are "The End of a Rainy Day" (41), by Mr. J. P. Brinson; "Breezy Weather in a Cornish Fishing Cove" (49) by Mr. F. Dixey; "Wild Poppies" (58) by Mr. H. G. Stormont; and "Beer Bay, S. Devon" (68) by Mr. Lexden Pocock. Among architectural subjects there is a good drawing of Newgate Prison (14), of some interest just now, by Mr. Jas. S. Ogilvy, and one of the gates of the temple at Medinet Habu, by Mr. A. Meyrick.

NEW THEATRE AT CORFU. — Mr. Blakeney, British Consul for the Ionian Islands, writes that the municipality of Corfu having decided in 1893 to erect a new theatre, an Italian engineer, Signor Pergolési, tendered to execute the work for 987,000 drachma, equal to 24,675*l.* sterling. His tender was accepted, and the construction of the building commenced in July, 1893. In 1895, however, owing to a want of funds on the part of the municipality, the engineer was compelled to suspend the work up to the year 1901, when the new Mayor succeeded in contracting a loan with the National Bank in Athens for 1,000,000 drachma, out of which he paid to the engineer 6,875*l.* in order to complete the work, which was effected in February of the present year. The building covers a space of 2,696 sq. yds., and stands very close to the site where the old Venetian town gate—"Porta Reale"—once stood. It is a fine building, its only defect being that it is too grand, and it is the general belief that Corfu, in its present unsatisfactory financial condition, will find it very hard, if not impossible, to maintain it. The old theatre is to be turned into public offices.

PALESTINE EXPLORATION FUND.

THE annual meeting of the above Fund was held on Tuesday last at the Royal Institution, Albemarle-street, Lord Eustace Cecil presiding.

The hon. sec. read the report, which stated that nineteen meetings had been held during the year for the transaction of business. It was with much satisfaction the Committee were able to announce that the local difficulties which at one time threatened to seriously interfere with the active prosecution of the exploratory work of the Fund had at last been overcome, and that Mr. Macalister was now at work on the mound that covered the ruins of Gizeh. During the long period of waiting, Mr. Macalister had been actively engaged upon minor researches in and near Jerusalem, and on a visit to Beersheba, where the building operations of the Turks, on permanently occupying the place, had led to the discovery of the remains of a Byzantine town. Amongst the more interesting discoveries at Jerusalem had been an aqueduct, partly of very ancient date, which at one time carried the water of the Virgin's Fountain down the valley of the Kidron; the orifice in the rock from which the water issued, and new tombs and ossuaries. In Palestine might be noticed the stele of Seti I., Pharaoh of Egypt, found by Professor G. Adam Smith at Tell esh-Shihâb, east of Jordan, and several inscriptions of importance. The German excavations at Ba'albek, and those of the Austrians at Tell Ta'anuk (Taanach) had been fruitful of results, but only some of the general features of the discoveries had yet been made public. Excavations had been commenced by the German Palestine Society at Tell Mutsellun, believed by many authorities to be the site of Megiddo, and it was believed that the Berlin Academy intended to excavate at Jerash or some other Græco-Roman town east of Jordan. The American School for Oriental Study at Jerusalem had also been at work, and an effort was now being made in the United States to raise funds for the excavation of an important site in Western Palestine. Those enterprises which furthered the objects for which the Fund was created were being well supported in the countries that had undertaken them, and in wishing them every success the committee expressed the hope that the liberality of the subscribers to the Fund would enable Mr. Macalister to make that thorough examination of the ruins of Gizeh from which so much was expected. The committee tendered their thanks to many friends for help in various ways, notably to Dr. Bliss for his account of the German excavations at Ba'albek, and to the editor of the *Builder* for permission to reproduce an illustrated article on the same subject from that paper. Since the last meeting seventy-five names had been added to the list of subscribers, and eighty-six had been struck off through death and other causes.

The Chairman, in proposing the adoption of the report, referred with regret to the losses the Fund had sustained through the deaths of the Marquis of Dufferin, Dr. Wesselt, the late Bishop of Durham, Sir Richard Temple, Dr. Conrad Schick, and Mr. T. Rymer, all members of the general committee. He regretted too that the number of subscribers showed a slight falling off, but he trusted that would prove to be only temporary. The report showed that many of the excavations in and around Jerusalem had been fruitful in results. Speaking as one who had not seen the Holy Land for thirty years, he was afraid if he were to visit it now he would find a great many changes which were not all for the better. He was not sure that he would approve of the railway between Joppa and Jerusalem, and he was sure there was one thing of which he would disapprove, viz., the manner in which the excavations and the antiquities of the country were being more or less interfered with and disturbed, sometimes for reasons of profit and sometimes for other reasons, by the natives. He thought that was a very serious matter, but he was afraid it was likely to be the case not only in Palestine but in Egypt and elsewhere. He was glad to acknowledge the liberal manner in which Americans had always supported the Fund, and a great deal of its success was due to their cousins on the other side of the Atlantic.

The Rev. Dr. Rogers, in seconding the motion, said that if Palestine was to be excavated, the time to do it was emphatically now, and it they wished to obtain as much information as possible of the past and transmit it to posterity, they must be up and doing.

The report was then adopted.

Major-General Sir C. W. Wilson, K.C.B., F.R.S., the Chairman of the Executive Committee of the Fund, then delivered an address on the recent and proposed excavations of the Fund. He said that the work of the Fund under the last Irádeh was the excavation of certain mounds in the Shephelah, or low country of Judah. An examination of these mounds would, it was thought, add to their knowledge of the race or races living in the district during the Israelite and pre-Israelite periods, and at the same time throw light on the sites of Gath and other places not yet identified. He would endeavour to give a brief summary of the results obtained. Tell Zakariya, the first site attacked, rose above the vale of Elah, and from its summit there was a striking view of the battlefield upon which David slew Goliath. There the excavations disclosed the existence of a town, founded in the pre-Israelite period, which commenced about 1500 B.C.; fortified in Jewish times, possibly by Rehoboam; occupied during Seleucial times; and deserted after a brief Roman and Byzantine occupation. In a jar resting on the rock beads, scarabs, and Egyptian amulets were found, which confirmed the age assigned to the foundation of the town from the pottery. The earliest coin unearthed was an Athenian piece of 10 drachmas, struck between 526 B.C. and 430 B.C.; the latest, one of Constantine in the fourth century A.D. The sides of the hill were honeycombed with subterranean chambers hewn in the soft limestone rock. No clue was obtained to the name of the town, but Dr. Bliss suggested that it might have been Azekah or Socoh. Tell es Sáfi, supposed by many authorities to be the site of Gath, stood at the mouth of the Vale of Elah as a natural fortress between the Shephelah and the Plain of Philistia. Unfortunately the space available there for excavation was small, for most of the summit of the hill was occupied by the modern village and large cemeteries. The discoveries, however, were of great interest, and indicated that important remains lay hidden in the unexplored portions of the mound. The excavations showed that the site was occupied in the early pre-Israelite period, certainly as far back as the seventeenth century B.C., and that the occupation was continuous down to Seleucid times. Then the place apparently was abandoned until the arrival of the Crusaders, who in 1144 built upon it the important fortress of Blanche Gards. Perhaps the most interesting discovery was that of three upright monoliths, with the remains of enclosing walls which evidently formed one of the "high places" so frequently mentioned in the Bible. From fragments of Mykenæan pottery found, the date of structure must be between 1500 and 1200 B.C. The town walls appeared to date from the Jewish period, probably from the reign of Rehoboam. In the débris of the Jewish town was found jar handles with Royal stamps; early Greek ware (700-550 B.C.), and a few specimens of Greek black and red figured ware (550-350 B.C.) Several Egyptian, Assyrian, and Babylonian objects were found and fragments of interesting figures in terra-cotta. Nothing was discovered which directly identified the place with Gath, but its history, as disclosed by the excavations certainly favoured the identification. At Tell-el-Judith, the next site which laid south of Tell Lakáriya, the excavations disclosed the existence of a town founded in the early pre-Israelite period abandoned long before the Hebrew conquest; reoccupied during the Jewish Monarchy, and apparently fortified in Roman times. The pottery, illustrating the Jewish period, was especially valuable. In the centre of the mound a Roman villa was found. The excavations at Tell Sandahamah, about one mile south of Beit Jibrú was of exceptional interest. They proved the existence of a walled Seleucid town built on the ruins of a Jewish town, which was almost certainly the Biblical Marishah. The finds in pottery were unusually rich and valuable for the illustration of the Seleucid period, of which little had previously been known. Much light was thrown on the history of the camp in Palestine. Over 350 stamped jar handles were found, and here were uncovered three inscriptions of the Seleucid period. Near the south-west corner of the town some fifty fragments of very soft limestone covered with Greek and Hebrew inscriptions were found. During the progress

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of the excavations the remarkable caves in the vicinity of the several sites, and more especially of Tell Sandahamah, were systematically examined and planned by Mr. Macalister; and to him they owed the first attempt to grapple with the difficult task of classifying and approximately dating the rock-cuttings of Palestine. It was true that in one sense the result was disappointing, for little was found in the caves to throw light on the origin and history of those who made and, in some cases, lived in them; but it was not likely that more precise information could be obtained without the complete excavation of a few selected caves. Mr. Macalister's conclusions were that a few of the caves were later than the Seleucid period; that a few others were earlier than the end of the Jewish monarchy, and that there was Scriptural evidence that similar caves existed at a still earlier date. As to future work, Major Wilson said the Fund had been carrying out a number of observations on the fluctuations of the level of the Dead Sea. They wanted to continue those observations, and, if possible, carry them out in a fuller manner, and they were also particularly anxious to obtain meteorological observations in the Jordan Valley, with the more perfect instruments of the present day.

A hearty vote of thanks was accorded Major Wilson for his lecture, which was accompanied by some very beautiful lantern slides illustrating some of the pottery and other articles discovered in recent excavations.

Replying to the vote of thanks for presiding, the Chairman said he could only express the earnest hope that the Turkish Government could be induced to give a little more protection to these ancient monuments, or he was afraid that with the vandalism of the East and of the West they would soon become a thing of the past.

ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A MIDLAND Counties District Meeting of the members of the Association of Municipal and County Engineers was held at Wolverhampton on Saturday, June 14. The meeting brought together a large number of members, special interest centreing in the papers dealing with the Lorain surface contact system of electrical traction. Mr. E. G. Mawbey, C.E., of Leicester, President, occupied the chair, and among those present were Messrs. Howard Smith, Westminster; E. Berrington, Westminster; J. T. Eayrs, Birmingham; J. Price, Birmingham; J. A. Angell, Beckenham; A. M. Fowler, Manchester; R. E. W. Berrington, Wolverhampton; C. Brownridge, Birkenhead; A. Burton, Stoke-upon-Trent; T. Caink, Worcester; G. W. Dixon, Harrogate; J. Gammage, Dudley; J. Haigh, Abergavenny; T. W. A. Hayward, Sudbury; A. C. James, Grays; A. J. Jenkins, Rotherham; J. Lobley, Hanley; G. T. Lynam, Burton-on-Trent; H. C. Marks, Carlisle; G. Mitchell, Warrington; E. B. Newton, Paddington; J. S. Pickering, Nuneaton; H. W. Taylor, Newcastle-on-Tyne; H. T. Wakelam, Middlesex; O. E. Winters, Hampstead, and others.

In consequence of the Town Hall being in the hands of the builders the business proceedings were held in the Drill Hall, Stafford-street. At the outset

The Mayor, in the name of the Corporation, welcomed the Association to Wolverhampton. He said that knowing how much the municipal engineer did for municipal life they welcomed them to Wolverhampton with all heartiness. They had many things, such as the new system of electric traction, which would interest them very much. And not least they had the great effort of the Corporation in this Coronation year—their Exhibition.

The President proposed a vote of thanks to the Mayor for the cordial welcome he had extended to the Association. They never held a meeting but they reaped some advantage in knowledge and experience, and that knowledge was alike beneficial to the members and to the Local Authorities whom they represented. The surface contact system of electric traction was a matter of great interest to everybody all over the United Kingdom; and if the Corporation succeeded with their experiment, both practically and financially, they would have done a great service to the community. In fact, they would do a great service to the community even if they failed. As to the exhibition, he thought the Corporation deserved the admiration of the country for having undertaken, organised, and carried out such a magnificent exhibition.

Mr. C. E. C. Shawfield, Borough Electrical Engineer, contributed a paper on the Wolverhampton Corporation Tramways Electrical Equipment. He said the surface-contact system of electric traction was first brought before the Tramways Committee in March, 1901, when an offer was made to them by the Lorain Steel Co., of America, to equip about eleven miles of single track with their system, and to allow the Corporation a twelve months' trial thereof on the understanding that if the system failed to prove itself thoroughly safe and reliable, and commercially successful in operation, it should be taken up again and the whole cost of the experiment borne by the company. After lengthy negotiations a contract was entered into on this basis with the Lorain Steel Co., and accepted by the Council on the Committee's recommendation. The portion of the tramways upon which this was being tried consisted of about five and a half miles of double-track running from the south-east to the north-west corner of the Borough traversing the principal streets in the centre of the town, and forming a loop through the residential districts of Tettenhall and Whitmore Reans. The whole of the feeder and distributing cables were supplied and laid by Callender's Cable and Construction Co., Ltd., on their well-known solid system. Each cable consisted of a stranded copper conductor of 100 per cent. conductivity, insulated with vulcanised bitumen, which was protected externally by tape and hemp yarn braiding. The cables were laid in troughs constructed of seasoned red deal impregnated with preservative compound, and were supported at intervals of 18 in. by wooden bridges. The troughs were filled up solid with Trinidad bitumen, and covered over with hard blue bricks as a protection against mechanical injury. The main-feeder cables were in all cases laid under the footway at a depth of from 14 to 18 in., the sectional area of the conductor varying from 0·2 square inch to 0·4 square inch. The distributing cables (which correspond to the trolley wires of the overhead system) were laid in the centre of each track under the concrete bed of the permanent way, and were divided up into sections not exceeding 100 yards in length, in order to facilitate the ready localisation of faults either in the cable or in the contact-boxes. The sectional area of each distributing cable was about ·05 square inch. The feeder pillars were located on the footpath at distances of 200 yards apart, the main feeder being taken into each feeder pillar and connected to a bus bar, from which the current was supplied to the distributing cables under the track by means of four switch fuses. A 3-core pilot and telephone cable was laid in the same trough with the main feeder cables, and a tapping was taken therefrom into every feeder pillar and joined through a disconnecting board to a telephone plug placed on the door of the pillar. A telephone instrument was carried on each car, so that in the event of a breakdown on any line the driver or conductor of any car had only to go to the nearest feeder pillar—which could not be more than 100 yards distant—and could at once communicate either with the chief engineer's office, the switchboard at the generating station, or with the traffic manager's office at the car shed. Each rail joint was bonded by three 000000 S. W. G. copper bonds fixed on the inner side of each rail, the holes being punched through the web of the rail, and reamered out the correct size at the time of fixing the bonds. Two Columbia bonds and one Neptune bond were used at each joint, the area of contact at each bond being approximately seven times the cross section of the bond. Cross bonds were also inserted at distances of 120 ft., and the up and down tracks were bonded together at similar intervals. In each case where any special track work occurred the joints between the rails and the special work, and between the various sections of the special work, were bonded together; and, in addition, the whole length of special work was bridged over by heavy copper stranded cable. Provision had also been made at certain points for the connexion of return feeder cables to the rails, should they be required at any future time. The method of operation of the contact block might be briefly described as follows:—So long as there was no car immediately over the box the soft iron armature, together with the lower carbon contact, remained at rest on the bottom of the armature cup, and the street contact plate remained dead. Immediately, however, upon the passage of the car over the box the magnetic skates projected downwards through the cast-iron cheeks of the street contact plate, and completed their circuit through the soft iron armature, which was immediately pulled up until the lower carbon made contact with the upper carbon, thus making the street contact plate "alive," and transmitting electrical energy from it to the collecting skate and thence to the motor equipment of the car. As soon as the car had passed, however, carrying with it the magnetic skates, the magnetic attraction ceased, and the soft iron armature, together with the lower carbon contact, dropped back to their normal position at the bottom of the hollow armature cup, cutting off the supply of electrical energy and leaving the street contact plate dead. As the contact boxes were set 10 ft. apart in straight track and closer together on the curves, and as the collecting skate was 13 ft. in length, it was obvious that the skate was always in contact with one or more boxes at a time, and consequently the supply of energy to the car was continuous. The magnetic skates projected about 2 ft. beyond either end of the collecting skate. The effect of this was that each stud was made "alive" before the collecting skate reached it, and was kept "alive" until after the collecting skate had left it. The object of this arrangement was to ensure that there should be no sparking between the carbon contacts due to the making and breaking of the driving current of the car. The cars in use at the present time consisted of three types, viz., double-deck, single-deck, and single-deck combination type, all of which were mounted on Du Pont and Brill single trucks. In order to facilitate the attachment of the magnetic equipments, the trucks had been made with 6 ft. 6 in. wheel base and 33 in. wheels, instead of the usual 6 ft. wheels base with 30 in. wheels. The motor equipments of these cars had been supplied by four different firms, viz., Lorain Steel Co., British Westinghouse Co., British Thomson-Houston Co., and Dick, Kerr, & Co., and consisted in each case of two 25 h.-p. motors with single reduction gear, with ratio of 4·8 to 1. The controllers were of the series parallel type, and in addition to the usual operating notches were provided with five electric brake notches, in order that the motors might be used for braking purposes in case of failure of the ordinary mechanical brakes.

Mr. G. Green, Borough Engineer, read a second paper, dealing more particularly with the trackwork. The estimated cost was 210,000*l.* for about twenty-three and a half miles of single track. Some eleven and a half miles were at present constructed, and the Board of Trade had certified five and a half miles of single track. The rails, which weighed 91 lbs. to the yard, were in 60-ft. lengths, and were laid upon 6 in. of cement concrete mixed 6 to 1. The joint used was the Victor joint. The whole of the rails had been tested at the works by an expert before being delivered on the track. So had the points and crossings made in England. Some of the points and crossings used for the special work had been supplied by an English firm, and the remainder by the Lorain Steel Co., of Ohio, U.S.A. While anxious to say all that was possible about English workmanship he could not help expressing his regret that that supplied from this country was not so well designed or as accurately and truly constructed as that procured from abroad. It must be admitted that the cost of the American work was considerably higher than the English, but the difference was probably balanced by the saving in cost in fixing the former as against the latter, and the fact that short lengths of rails were cast into each crossing enabled the jointing of rails and crossings to be made in the best manner. This might be somewhat owing to the want of experienced platelayers, but the same men were able to lay out and fix the Lorain work in at least a third of the time that they took to put together the English-made work. Rapid construction was of considerable importance in large towns where interruption of traffic was a serious matter. The paving of the greater part of the track was granite setts, but in portions wood paving of red gum and prismatic oak had been used. The surface contact-boxes were placed every 10 ft. exactly in the centre of the track, and consisted of stoneware cases 14 in. by 10 in. made of "re-

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constructed granite." In granite sett paving they were hardly discernible, but they showed somewhat more in a wood-paved street. As an official he desired it to be distinctly understood that he expressed no opinion upon the system, first because his position rendered such an expression undesirable until the trial period was ended, and secondly because the short time the system had been working was insufficient to form any correct idea of its possibilities.

Mr. J. Price, Birmingham, who proposed a vote of thanks to the authors, said he could not help admiring the pluck of Wolverhampton in carrying out an entirely new system of electrical traction. As one who had carefully considered the matter, he could not help being struck by the fact that such a system as this, if successful, would overcome very many of the difficulties which they had in the overhead and conduit systems. This system, however, had its own defects. He feared the heavy traffic which passed over the streets in a town like Wolverhampton would cause disintegration of the contact-boxes, and that they would have the penetration of moisture into the internal parts of the boxes.

Mr. J. T. Eayrs, Birmingham, who seconded, said this was an experiment such as engineers liked to see, as they had the line at work in its entirety. It was quite natural, under the conditions of the experiment, that the engineers would not commit themselves until they had a full trial. He had heard of residents of Wolverhampton who, when driving, avoided the tram track, and he did not think cyclists could appreciate riding over these contact-boxes. Whether it was that the track was laid before the boxes were put in he could not say, but in some instances they were rather objectionable, while in others they did not offer any obstruction to traffic in the streets. He should say, if they got heavy traffic passing over the boxes, such as was common in South Staffordshire, it might crack these reconstructed granite cases, and cause moisture to get in the boxes, and as soon as the insulation was gone there was an end to the system. It also appeared to him that there was greater danger of leakage from the connexions than with the overhead trolley system.

Mr. Howard Smith, Westminster, speaking respecting special work, admitted that the American work was well finished. They had had large experience, perhaps larger experience and greater in extent than makers in this country, but, seeing that all the work had been tested, he did not see why there should be any particular difficulties with the English work. He had experienced no difficulties with English work, but had found it quite as good for its purpose as American work. It altogether depended upon the design and the care with which they supervised the particular class of work.

Mr. Wilson, Harrogate, also referred to the possibility of moisture getting into the contact boxes, and asked whether there was any data as to the wear and tear of the skates. He thought the wear must be considerable, and was of opinion that there was a danger of short circuiting.

Mr. Wakelam, County Surveyor of Middlesex, considered that they must wait for a twelve-months' working, with a winter trial, of the system, before any definite opinion could be expressed respecting it.

Mr. Green, in reply, said the contact boxes did not interfere with the traffic. There was a difficulty in driving over them, but as far as he knew there had been no complaints that they were dangerous to traffic. Neither had they been damaged by the traffic. They had one instance of a traction-engine, drawing two trucks with a heavy boiler, stopping on one of these boxes, but nothing went wrong with it, and the box was still in its place.

Mr. Shawfield, in reply, said he could not give any idea as to the life of the reconstructed granite boxes. In several cases water had found its way into the boxes owing to fractured cups. He thought the danger from them had been rather exaggerated. He had tested it himself in the case of live boxes, and been unable to feel anything except on one occasion, when he had thin boots on and had been walking about all day in the wet. Then he certainly did feel something, but not very serious. The life of the skates was over a thousand car miles, and he hoped to increase it to 2,000 or 3,000 car miles. The present cost of running per car mile was 3·5d., but he thought they ought to have six months' working before attempting to state it definitely. Short circuits had been very frequent. They had been caused by scrap-iron picked up by the magnets coming into contact with the skates and the cross rail at the same time. When the cars started, the enterprising youths of the town used to collect scrap iron or hair-pins, and scatter them over the boxes and rails, especially at night time, and he had had as many as eighty short circuits in a day. Now they were getting tired of it, and certain improvements had been made, so that the number of short circuits had very much decreased.

Mr. G. Green, Borough Engineer, gave a short description of the Wolverhampton Corporation Cold Storage and Ice Factory. He explained that the cold stores were part of a larger scheme comprising a covered wholesale market, upon an adjoining site, now being designed, the total estimated cost of the whole being 23,300*l.*, exclusive of site. The cold stores, the site of which provided for future extensions, at the present time comprised five cold-storage rooms, having a cubic capacity of 16,650 ft. One of these rooms was intended to be kept at a temperature of about 35 deg.; the other four at 22 deg. In addition to this there was an ice cellar with a cubic capacity of 3,750 ft. The motive power for working the air-cooling apparatus, and also manufacturing the ice, was electricity supplied from the Corporation mains. Arrangements were made with the Lighting Committee to supply the power at 1*d.* per unit. For a small installation such as the present one this seemed to be a satisfactory arrangement, inasmuch as when the storage was very low, and the demand for ice very small, the least possible power would be wasted, whereas, with a steam or gas engine, power would be running to waste. The ice-manufacturing machinery was able to turn out 10 tons of can ice per day of twenty-four hours, and the cellar would store 90 tons. The reason for adopting the system of can ice as against block ice was because the ice would be used entirely locally, and be more convenient to use in that form. The plant had been supplied by the Linde British Refrigeration Company, and consisted of two compressors; one surface evaporating ammonia condenser; one ice tank, complete with necessary moulds; one filling tank; one thawing-off tank; one overhead electric travelling crane; one air-cooler, with fan, and the necessary motors.

Mr. J. C. Fergusson contributed a description of Fergusson's surveying circle and percentage unit of angular measurement.

The members were entertained by the Mayor to luncheon and the afternoon was devoted to an inspection of the Lorain system of traction and a visit to the exhibition.

THE LONDON COUNTY COUNCIL.

THE weekly meeting of this Council was held at Spring-gardens on Tuesday, Mr. J. M'Dougall presiding.

Loans.—The following loans were granted:—Bermondsey Borough Council, 13,922*l.* for electric lighting; Finsbury Borough Council, 6,460*l.* for various purposes; Battersea Borough Council 1,000*l.* for purchase of houses, and 2,030*l.* for street improvements; Hampstead Borough Council, 4,815*l.* for paving works; Wandsworth Borough Council, 7,900*l.* for purchase of land; and Paddington Borough Council, 2,600*l.* for the erection of mortuary buildings.

Steamboat Service.—Mr. Cornwall, on behalf of the Rivers Committee, submitted a report outlining a scheme for creating a municipal steamboat service on the Thames. Lord Welby, as Chairman of the Finance Committee, also presented a report on the same subject.

The scheme now proposed differed in some respects from that which was brought up in 1900. In preparing the present scheme the Rivers Committee aimed at a reduction of expenditure, both as regards capital outlay and cost of working, to the lowest possible limits consistent with a service sufficient to meet what they consider to be the needs of the case. Thus, a fifteen-minute service was now proposed over the entire course (which had been shortened by the elimination of the eastern-most section from Greenwich to Woolwich), whereas the scheme of 1900 contemplated a five-minute service between London Bridge and Vauxhall, with fifteen-minute intervals beyond. The number of boats has in consequence been reduced from forty to thirty, but the carrying capacity of each boat had been considerably increased. The outlay on piers had also been reduced to a minimum. It was assumed that the sixteen piers of the Thames Conservancy would be handed over to the Council free of cost on condition that the Council became responsible for their maintenance, and an expenditure of 70,000*l.* was proposed for the acquisition or provision of other necessary piers, and for providing waiting-room accommodation, to be warmed in winter. No provision was made for the enlargement of existing piers or the improvement of approaches thereto.

The recommendation of the Rivers Committee was:—"That the Council do seek for powers in the next Session of Parliament to acquire, take over, and administer the river piers and landing-stages on the River Thames, to construct additional piers and alter the location of the piers from time to time, and to establish an efficient steamboat service on the river. That it be referred to the Parliamentary Committee to take the necessary steps for this purpose."

After a short discussion this was adopted.

New Fire Station.—On the recommendation of the Fire Brigade Committee, it was resolved that the estimate of 12,000*l.* submitted by the Finance Committee in respect of the erection of a new fire station in Old Kent-road on the site of the existing station and adjoining property be approved, and that the Fire Brigade Committee be authorised to make the necessary arrangements for the erection of the building.

Holborn to Strand—Architectural Features.—The Improvements Committee reported upon the result of the decision to invite eight architects to submit designs on certain specified conditions for the elevation of buildings fronting on the Strand and on the crescent road to be formed between Wellington-street and Clement's-inn. The designs were publicly exhibited at the Gallery of the Royal Society of Painters in Water Colours from October 26 to November 3, 1900. The name of the architect submitting a particular design was not known, as arrangements were made that the design of each architect should not be signed, but should be accompanied by a sealed envelope containing the name of the architect submitting the design. The Council agreed to obtain expert advice upon the designs, with the result that Mr. R. Norman Shaw, R.A., readily accepted the invitation to advise in association with the Council's Superintending Architect, but expressed his desire not to accept any fee, as he stated he was anxious to place his services "at the disposal of a body engaged in the congenial occupation of beautifying the architecture of the city in which one dwells." The numbers used for the designs were 29, 27, 26, 23, 21, 20, 19, and 17, and after the experts' Report had been prepared and handed in, and the public exhibition of the designs had taken place, they opened the envelopes, with the result that it appeared that the following were the names accompanying the designs, placed merely in numerical order:—No. 29, Mr. Leonard Stokes; No. 27, Mr. William Flockhart; No. 26, Mr. Henry T. Hare; No. 23, Mr. Ernest George; No. 21, Mr. Reginald Blomfield; No. 20, Mr. Mervyn Macartney; No. 19, Mr. Edward W. Mountford; No. 17, Mr. Ernest Runtz. The Committee had acquired nearly all the property between the site of the new crescent road and the Strand, and as the surplus land would have to be dealt with before long, they thought it right now to submit to the Council the report of Mr. Norman Shaw and the Superintending Architect upon the designs sent in.

This report contained the following:—We have agreed on the following recommendation:—

"We place No. 26 first. The author has dealt with the plan in a simple and ingenious way, and has overcome the difficulty with skill of treating the various street corners. The main lines of the setting out as originally approved by the Committee are not materially departed from. Drury-lane and the corresponding street on the east side of the new road are shown to be arched over. Perhaps it may be considered that this would not be admissible, but it adds much to the artistic treatment of that façade. The architect of this design has dealt with the Strand front as devoted to a public building, but he shows a thorough appreciation of artistically adapting other portions of the improvement to commercial purposes. On the whole, the treatment is such that the Committee might reasonably expect

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lessees to carry out designs not inferior to these in point of cost.

We place No. 27 second. This architect deals with the commercial adaptation of the design quite as literally as No. 26. It is much to be regretted that he has adopted a decidedly French bias, as there is much skill and artistic feeling in the drawings, and we feel that if he had kept within the traditions of English Renaissance, the result would have been much better suited to the grand site which is intended to be treated, but the skill and power shown in the design cannot be set aside on that account, as style was evidently not intended to govern the issue. This design would probably be more economically carried out than No. 26, and therefore has, under that head, claims to attention; but we repeat the regrets that the influence of French architecture has been so perceptible in a design which is intended for one of the finest sites in the British capital.

We place the design of No. 20 third. In its artistic value it is very unequal. The arrangement on the plan for a circus at the south end of the new street to Holborn is a simple and dignified suggestion. The elevations for the north side of the curved streets are, however, feeble, but this appears rather to be due to the poorness of the drawings. Other portions of the design, especially the alternative design for a public building, possess great dignity and show scholarly perception of the importance of the site. It would, however, probably be more costly to carry out than No. 26. It may practically be considered the most expensive of the three.

We desire also to offer a word of comment on the very carefully thought-out block plan of No. 29, but the proposed emendations are, on the whole, not an improvement on the simple treatment of the Council's property suggested in the other designs, though the Somerset House extension is a conception which, if properly worked out, would add great dignity to the scheme.

It must be borne in mind that all the designs are little more than preliminary studies. We do not see how it is possible to suppose that they can be in any sense fully matured, as the governing conditions of plan, which are so helpful in designing elevations, are necessarily absent at this stage, and in selecting the above-mentioned designs we have been largely influenced by a feeling that they possess elements capable of being developed into works of great excellence.

The Committee added that the London County Council (Improvements) Act, 1899, which authorises the Holborn to the Strand improvement, made provision for the reinstatement of the Gaiety Theatre, Gaiety Restaurant, and Messrs. Shorts, Ltd., at the western end of the site which would be formed between the new crescent road and the Strand, and the Council had given its approval to a design submitted by Mr. Ernest Runtz and based upon Mr. Norman Shaw's sketch design for the elevation of the new theatre and restaurant. Mr. Norman Shaw very kindly made suggestions for the architectural treatment of the buildings in question, and produced a sketch design in illustration of his suggestions.

The report was agreed to.

New Fire Escape Vans.—The tender of Messrs. Bonallack & Sons to supply for 432*l.* six vans for carrying fire escapes was accepted.

Breaking up Roads.—The Highways Committee reported:—"In our opinion it is imperatively necessary that this question of the breaking up of the public thoroughfares should be dealt with as soon as possible, and we think it advisable that the Council and the City Corporation should, if it can be so arranged, take joint action with a view to legislation being promoted with regard to the matter. We therefore recommend 'that the Corporation of the City of London be requested to join with the Council in an application to his Majesty's Government to promote legislation, in the next session of Parliament, for regulating the breaking up, by companies and others having statutory rights, of the London thoroughfares.'"

This was adopted.

Coronation Stand at the Law Courts.—Dr. Longstaff, Chairman of the Building Act Committee, replying to a question, said his attention had been called to remarks by Mr. Justice Grantham with regard to the action of the Westminster Council in encroaching upon the footway in front of the Law Courts with a Coronation stand. Dr. Longstaff added that he supposed the Westminster Council were within their rights in erecting the stand, inasmuch as the footway was in their jurisdiction, but whether what they had done was desirable was a matter of opinion.

The City Fire.—The Fire Brigade Committee reported that they were making the most searching inquiries into the action of the Fire Brigade at the fire in Queen Victoria-street. The Chief Officer had not completed his investigations, but they would submit a report at the earliest possible moment.

ENGINEERING SOCIETIES.

INSTITUTE OF SANITARY ENGINEERS.—On the 14th inst. the Institute of Sanitary Engineers met at Buxton, in the Town Hall. Dr. J. C. Thrush, County Medical Officer of Essex, President of the Institute, was in the chair. The President, in his inaugural address, referred to the progress which had only recently been made in sanitary matters. In the methods adopted for the treatment of sewage, and in the great care taken to provide towns with a water supply above suspicion of pollution, they were probably still in advance of other nations. With regard to sewage, they were working on scientific lines, and sooner or later it would become possible to sufficiently purify sewage to permit of its being turned into any stream without a risk of causing a nuisance—and that, too, without having to employ any large area of land. To effect purification, they had invoked the aid of living organisms—the action being biological. As for the septic tank, it had never been advocated by any one as being more than an adjunct to some system of purification. It did not in any way purify the sewage, but it did render it more amenable to treatment by other bacterial processes. What was required was the discovery of some organism capable of being cultivated and utilised which possessed the special power of digesting vegetable fibre. Probably they would find that the bacterial system would ultimately be greatly modified. Experiments made at Buxton, under the advice of Dr. Barwise, the Derbyshire Medical Officer of Health, had resulted in the production of effluents of a most satisfactory character. So successful had the experiments proved that the Buxton Council hoped soon to treat the whole of their sewage by this process, and he confidently predicted that they would be successful. He pointed out the great need there was for ensuring the purity of water in towns. Everything should be done to provide against the possibility of pollution. In conclusion, he referred to the efficient equipment of hospitals for infectious diseases, and the importance of reliable disinfecting apparatus.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE following applications as reported upon by the Building Act Committee were dealt with at Tuesday's meeting of the London County Council. Unless otherwise stated consent was given. The name of the applicant appears between parentheses:—

Islington, West.—Rescission of resolution sanctioning the formation of a new street, for foot traffic only, to lead from Holloway-road to Warlter's-road, Islington, and the erection of a theatre building to exceed in height the width of such footway, and sanctioning the formation or laying out of a new street, for foot traffic only, to lead from Holloway-road to Warlters-road, Islington (Mr. F. Matcham). Theatre building on the south-west side of Holloway-road, Islington, to exceed in height the width of a proposed new street to lead from Holloway-road to Warlter's-road, upon which new street the building will abut (Mr. F. Matcham).

Lines of Frontage and Projections.

Hackney, North.—Warehouse buildings on the site of Nos. 36, 38, and 40, Boleyn-road, Kingsland (Messrs. Gordon & Gunton).

Lewisham.—A house, with a shop on the ground floor, on the northern side of Sydenham-road, Lower Sydenham, to abut upon Champion Park (Mr. E. Schneider).

Westminster.—One-story shops and an entrance porch in front of Nos. 125A, 127A, and 127B, Victoria-street, Westminster (Messrs. Z. King & Son).

Hackney, North.—A one-story building in front of a proposed warehouse building on the north side of Barrett's-grove, Stoke Newington, at the corner of Cressington-road (Mr. T. J. Wetherall).—Refusal.

Holborn†.—Projecting pilasters and a shop front at Nos. 108 and 110, High Holborn (Mr. W. C. Waymouth).—Refusal.

Lewisham.†—Houses in Ravensbourne-road, Blythe-hill, Catford, to the lines (Mr. J. W. Webb).—Refusal.

Width of Way.

Hoxton.—Buildings on the east side of Shepherdess-walk, Hoxton, to abut upon Nile-street, and with the external walls at less than the prescribed distance from the respective centres of the roadways of Underwood-street and Underwood-row (Messrs. F. Chambers & Son).

Bermondsey.—Erection of a temporary shelter and caretaker's house, with the external walls at less than the prescribed distance from the centre of the roadway of Grange-yard, The Grange, Spa-road, Bermondsey (Mr. R. J. Angel).—No order.

Bethnal Green, South-west.†—A three-story workshop and a one-story cart-shed on the west side of Hollybush-gardens, Bethnal Green, with the external walls of such buildings and the forecourt boundary at less than the prescribed distance from the centre of the roadway of the street (Mr. E. Brown).—Refusal.

Limehouse.—A three-story laundry building at the rear of No. 44, East India Dock-road, Limehouse, with the external walls of such laundry building at less than the prescribed distance from the centre of the roadway of Amoy-place (Mr. C. Dunch).—Refusal.

Width of Way, Line of Frontage, and Construction.

Deptford.—An open playshed and water-closet building in the playground of the Lucas-street schools, Deptford, with the external walls of such playshed and building at less than the prescribed distance from the centre of the roadway of St. Nicholas-street (Mr. T. J. Bailey on behalf of the School Board for London).

Width of Way and Construction.

Deptford.†—Two iron sheds on land on the west side of Trundley's-road, Deptford (Messrs. Mitson & Harrison).—Refusal.

Width of Way, Line of Frontage, and Space at Rear.

Fulham.—A building on the west side of Fulham Palace-road, Fulham, with the forecourt boundary at less than the prescribed distance from the centre of the roadway of Distillery-lane and with an irregular open space at the rear (Mr. W. Marchment).—Refusal.

Buildings for the Supply of Electricity.

St. Pancras, South.—An electric lighting substation on the north side of Tavistock-place, St. Pancras.

St. Pancras, North.—An electric lighting substation and outbuilding on the south-west side of The Grove, Highgate-road, St Pancras, at the rear of Clifton Lodge (Mr. S. W. Baynes).

Formation of Street and Space at Rear.

St. George's-in-the-East.—The formation or laying out of a street to lead out of Berner-street, Commercial-road, Whitechapel, and the erection of workshops without the open space at rear required by Section 41 of the London Building Act, 1894.—Refusal.

Cubical Extent.

Fulham.—At the Pimlico Wheel Works, Rannoch-street, Fulham Palace-road, Fulham, of a building to exceed in extent 250,000, but not 450,000, cubic feet, and to be used only for the purposes of a saw-shed and chopper-shed and for the storage of hard wood (Messrs. Smith, Parfrey, & Co., Ltd.).

Means of Escape from Top of High Buildings and Variation in Plane of Roof.

Marylebone, East.—Means of escape in case of fire proposed to be provided in pursuance of Section 63 of the London Building Act, 1894, on the seventh, eighth, ninth, and tenth stories of a block of buildings on the site of Nos. 164 to 182, Oxford-street (the upper surface of the floors of which stories will be above 60 ft. from the street level), for the persons dwelling or employed therein (Mr. R. F. Atkinson).

Dwelling-houses on Low-lying Land.

Lambeth, North.—A building on low-lying land situate at No. 5, New-cut, Lambeth (Messrs. Flood & King).

Lambeth, North.—A building on low-lying land, situate at No. 4, New-cut, Lambeth (Messrs. Flood & King).

Lambeth, North.—Two buildings on low-lying land, situate at Nos. 7 and 8, New-cut, Lambeth (Messrs. Flood & King).

Rotherhithe.—Four buildings on low-lying land at Manor-lane and Old-road, Rotherhithe (Messrs. Stock, Page, & Stock).

*** *The recommendations marked † are contrary to the views of the local authorities.*

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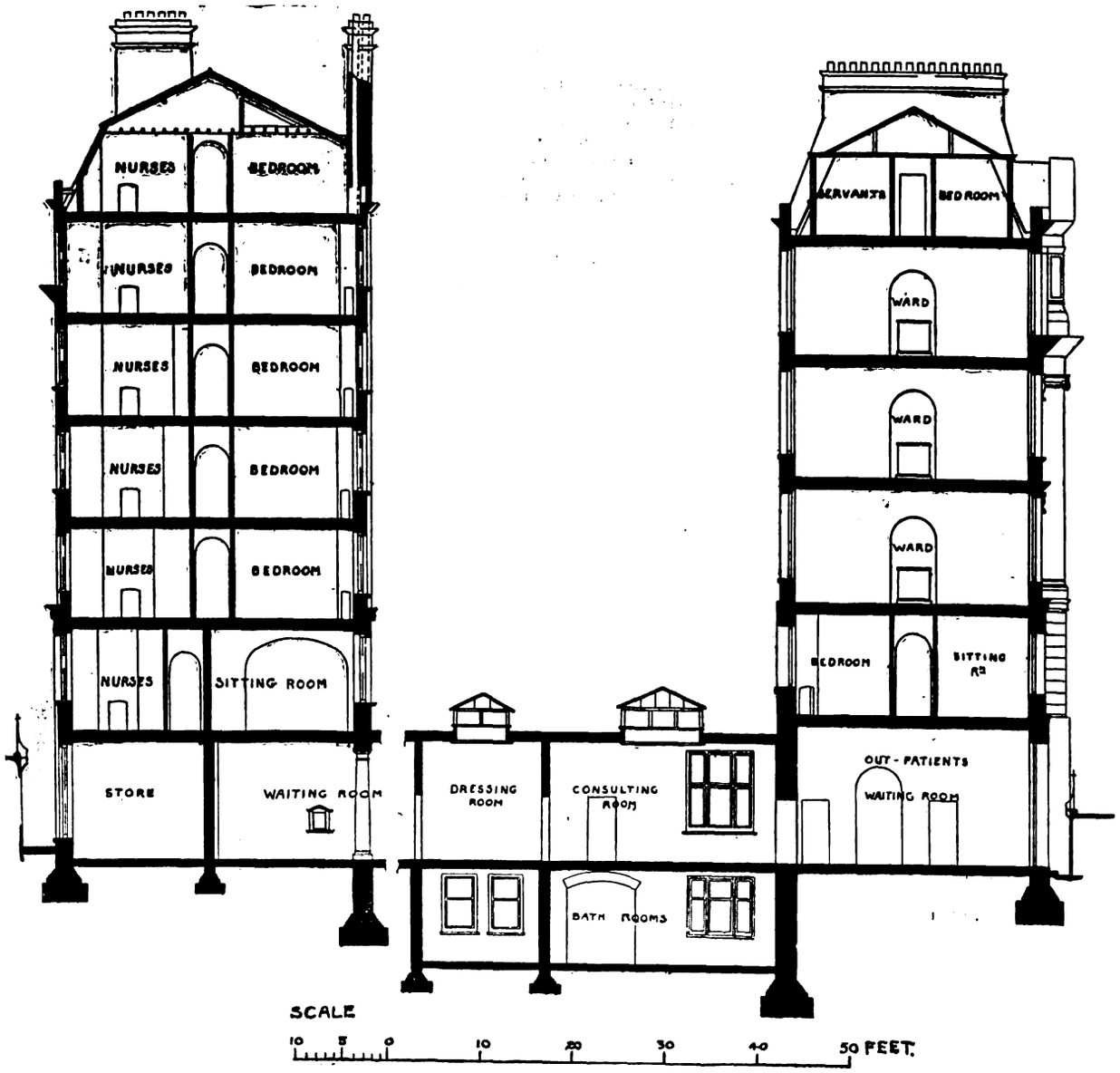

Additions to Charing Cross Hospital. Section.

Illustrations.

SOME RECENT FRENCH SCULPTURE.

THE two long panels illustrated on this plate, representing Autumn and Winter, are photographed from the plaster models, exhibited in this year's Salon, for two of the panels in Sèvres stoneware (*grès céramique*) which are to form a portion of the new scheme of wall decoration for the interior of the French Chamber of Deputies. As is fitting for such a position, they are modelled in very low relief. M. Roux is the sculptor. The original panels, as seen in the Salon, are, to the best of our recollection, about 11 ft. or 12 ft. high.

The central illustration on the plate represents the new monument to Alphonse Daudet, by M. Saint-Marceaux, just erected in the Avenue des Champs Elysées, and described in the "Letter from Paris" in our issue of June 7.

CHARING CROSS HOSPITAL:

ALTERATION AND ENLARGEMENT.

THE present buildings of the hospital comprise the main block facing Agar-street, and short extensions facing King William-street and Chandos-street.

For some years the Council has been acquiring the adjoining properties, and the hospital is now in practical possession of the whole of the ground between the present buildings and the Royal Westminster Ophthalmic Hospital. It is a matter for regret that it has been impossible to acquire the land occupied by the Ophthalmic Hospital and thus to round off the site.

The scheme of reconstruction necessitates in the first place the entire removal of the extensions facing Chandos and King William-streets, leaving the Agar-street block clear and free from obstruction to sun and air.

A new ward block is to be erected facing King William-street, and a complete nurses' home in Chandos-street.

Both these blocks are isolated from the Agar-street block and one another by open spaces.

Entrances.— The principal entrance is, as heretofore, in Agar-street, and will be used only by the administration.

A casualty case entrance is provided in King William-street; and adjoining is that of the out patients' department.

A cartway entrance also gives direct access to the goods delivery yard.

The exit for out-patients leads to Chandos-street.

Agar-street Block.—From the entrance-hall in the centre, wide corridors give access to the Board and Committee rooms, secretarial offices, and honorary staff room on the south side, and to dressers' and students' waiting-rooms, matron's office, library, and chapel on the north side.

The basement contains a large general kitchen, stores, boiler-house, engineer's shop, &c.

The three upper floors are to be devoted mainly to medical wards.

In the centre of the top or attic floor are two operating lecture theatres.

On the north side (but absolutely disconnected from the theatres) are isolation wards with separate access (lifts and staircase from the ground and basement levels.

On the south side are rooms to be devoted to the clinical department and registrar's office, &c.

Entirely new sanitary annexes are provided, and it may here be added that the old buildings retained will be refitted throughout with new pipes, drainage and water supplies.

King William-street Block.—The new block in King William-street contains on the ground-floor, quarters for the medical staff.

The three upper floors are devoted to surgical wards, and the top, or attic floor, to servants' bedrooms, and a special ward for Jewish women.

Baths.—Baths are placed next the wards, and further special bathing accommodation (which will include a small Turkish bath, needle bath, &c.) is provided in the sub-basement. Movable baths are, however, provided on each floor for special cases.

Nurses' Home.—This block contains on the ground floor, separate dining and sitting rooms for probationers and staff nurses, and separate bedrooms (eighty in all) on the five upper floors.

Out-Patients' Department.—The out-patients' department, casualty rooms, and dispensary will occupy practically the whole of the basement area of the new blocks and intervening courtyard. The level will be an average of 4 ft. below King William-street.

From the entrance in King William-street a wide corridor and easy, wide steps lead to a spacious waiting-room, at the side of which are ranged four large consulting-rooms, each with two dressing-rooms attached.

All the consulting-rooms, and most of the dressing-rooms, have both side and top lighting. They are so arranged that the patients leaving do not re-enter or traverse the waiting-hall.

In the rear of the consulting-rooms is a dispensary with a small waiting-hall.

Casualty Department.—The Casualty Depart-

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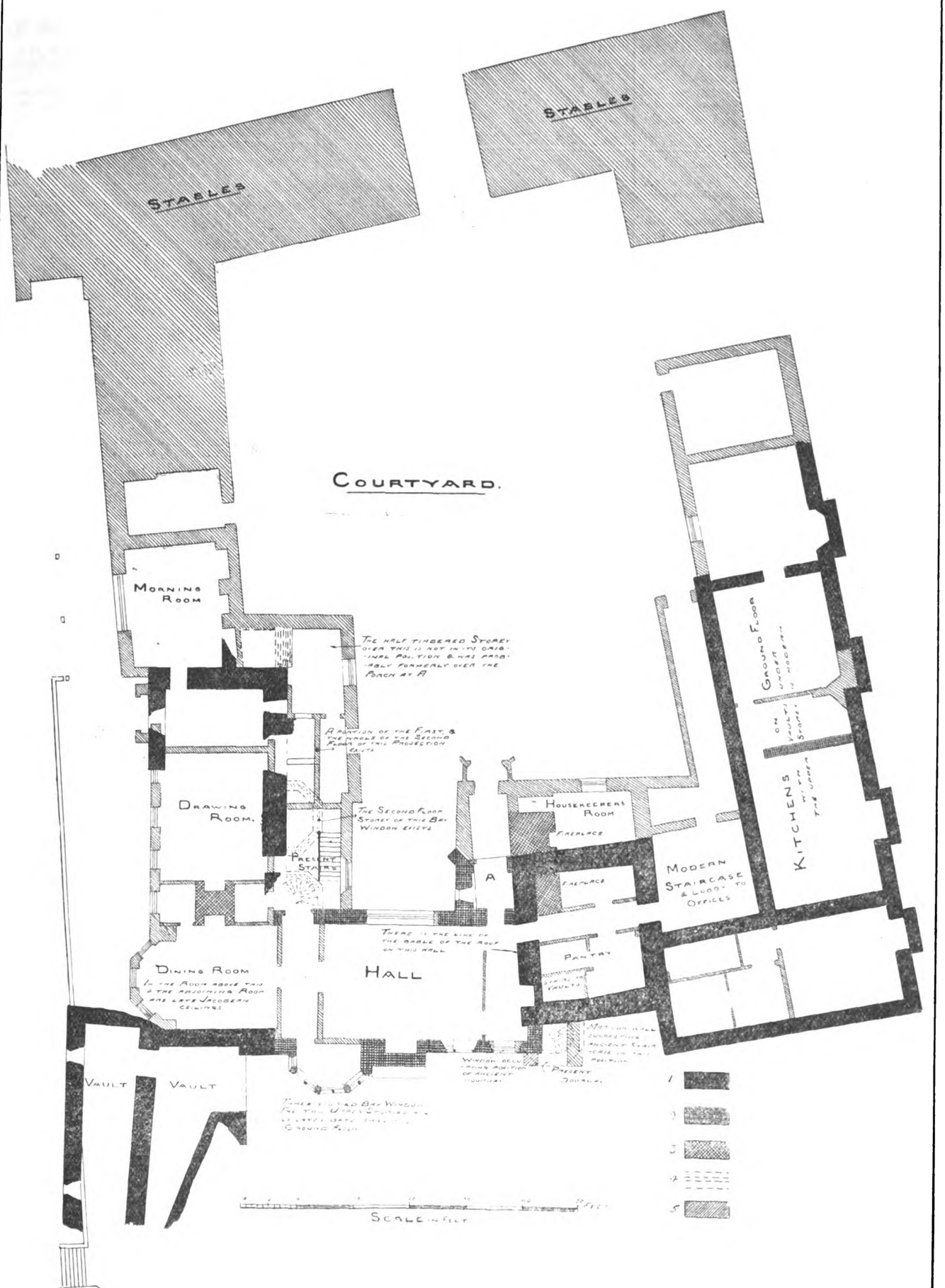
LUDFORD HOUSE LUDLOW.



Plan of Ludford House.

1. Works prior to the sixteenth century, to be seen mainly in the cellars and none above ground floor.
2. Work of sixteenth century, probably that of Edmund Foxe. The hall was of one story, and there is no evidence of work of this date above first floor.
3. Work of the latter part of the sixteenth century, probably that of William Foxe.
4. Conjectural sixteenth century.
5. Work of the eighteenth and nineteenth centuries, and of doubtful date.

(*See next page.*)

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ment is so placed that an ambulance can be wheeled in straight to the operating-rooms from the street level without the obstruction of steps.

Two operating-rooms and a waiting hall are provided. Two small wards (male and female) are also provided in connexion with this department and on the same level.

Central Staircase.—The new main staircase is so placed as to serve all three blocks to which it is connected by bridges at each floor level. It will be fitted with passenger and goods' lifts.

On the top of the staircase and above the level of all the surrounding buildings are placed two sets of isolation wards, access to which is obtained from the main staircase by a small open staircase, besides which there is a special lift from the basement which is also open.

The three main blocks are also connected at each end to one another by means of fire-escape bridges.

It is intended that the construction of the buildings shall be of the most solid and thorough description in every respect, and whilst no expense will be incurred in merely decorative and ornamental accessories, glazed tile and hard wood surfaces will be freely used to ensure cleanliness, and no expense will be spared in rendering the sanitary arrangements, pipes, and fittings as perfect as modern hygiene demands.

The Council have lately made a contract with Messrs. Holloway Bros. to carry out, at a cost of 82,730*l.*, the greater part of the new buildings, which include the out patients' and casualty departments, the whole of the surgical block facing King William-street, the greater part of the nurses' home, and the new central staircase.

Mr. A. Saxon Snell is the architect, and Mr. W. H. Noble is acting as clerk of works.

LUDFORD HOUSE.

BY THE LATE ARTHUR BAKER.

THE following description, together with the plan and the drawings reproduced in the lithograph, were communicated to us by the late Mr. Arthur Baker shortly before his death, some three or four years ago. That sad event led to their being put aside at the time; but we now give them, with his description, as he left it:—

"Ludford is alike interesting architecturally and historically.

It appears first in Domesday Book as being held by Osborne Fitz Richard of Richard's Castle. In 1185 Pair de Ludforde is mentioned as witness to a deed; and in 1243 Pagar de Ludford, who held under Roger de Mortimer of Wigmore Castle, is witness to the charter of the hospital dedicated to Holy Trinity, St. Mary, and St. John the Baptist, which was founded by Peter Undergood on a site on the north side of the Teme near the bridge, which he purchased from Walter Fitz Nicholas; and Leland states that he confirmed to the hospital his other purchases and possessions in London, Ludford, and elsewhere.

From this time to the middle of the sixteenth century I can find no record of its owners, but the evidence of the house prior to this date is very considerable and sufficient to show that it must have been a very large house.

I have shown this work on the plan with a black shade.

Of the sixteenth-century work there remains the hall, which was originally of one story with a pointed roof. There is evidence, also, of some reconstruction of the south wing, which was no doubt necessary to adapt the building to the new-fashioned Tudor plan. This was probably the work of Edmund Fox, to whom a lease of the Hospital of St. John was granted in 1535.

At the dissolution, the hospital and the property belonging to it was seized and granted to John, Earl of Warwick, in 1547, from whom it was purchased by William Fox.

The fact of Edmund Fox having taken a lease of the hospital lands in 1535, and William Fox buying the property from the Earl of Warwick, shows that the family were wealthy, and confirms the impression given by the character of the upper stage of the bay-window in the hall and the dormer window (which I discovered hidden in the modern roof of the south wing), that the house was considerably enlarged towards the close of the sixteenth century, either in the time of William Fox or Sir Edward Fox, who was Sheriff of Shropshire in 1608.

Shortly after this the house again changed hands, passing by purchase into the family of Chaitton, of Appley Castle. It is said to have been bought by Sir Job Charlton in 1609, but if this date is correct, his father, Job Charlton, must have been the purchaser. Sir Job Charlton was Chief Justice of Chester, then one of the Judges of the Common Pleas in the reign of Charles II., and afterwards Speaker of the House of Commons, and created a baronet in 1686. His great-grand-daughter and heiress, Elizabeth, married Edmund Lechmere, of Harley Castle, from whom the present owner, Captain Reginald Parkinson, is descended.

Since the time of Sir Job Charlton, many alterations and additions have been made, but enough happily remains to tell its history in the illustrations in which I have endeavoured to show its possible condition in the time of Edmund Fox, 1535, and also when it came into the possession of Sir Job Charlton.

A tradition exists at Ludford that the house is the site of the hospital of St. John, but this is contrary to the statements of Leland and Dugdale that the hospital was on the north side of the Teme. The tradition may have arisen from the fact of the hospital owning land at Ludford, and of Edmund Fox acquiring a lease of the hospital shortly before its dissolution."

ARCHITECTURAL SOCIETIES.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—The summer examination of the Scotch candidates took place this week in Glasgow, in the School of Art Building, 167, Renfrew-street, by favour of Mr. F. H. Newbery, the Head Master. The examinations were in charge of the President of the Glasgow Institute of Architects, Mr. Horatio K. Bromhead, F.R.I.B.A., assisted by Messrs. John Hutcheson, F.R.I.B.A.; T. L. Watson, F.R.I.B.A.; A. M'Gibbon, A.R.I.B.A.; Jas. Lindsay, A.R.I.B.A.; Wm. Fraser, A.R.I.B.A.; and Jas. Lochead, A.R.I.B.A. The examinations were concluded in the rooms of the Glasgow Institute of British Architects, 187, Pitt-street, on the 12th inst.

COMPETITIONS.

TECHNICAL SCHOOL, SUTTON COLDFIELD.—A special meeting of the Town Council has been held for the purpose of receiving a Report from the Technical Education Committee. The Mayor presided, and submitted the Report of the Committee, which stated that seven sets of competition designs for the proposed new technical school were received, and they recommended that the prizes of 25*l.* and 15*l.* be awarded to Messrs. Crouch & Butler, Newstreet, and Mr. D. Arkell, Temple-row West, Birmingham, respectively. The Committee further added with regret that the estimated cost of the building, according to these designs, was in excess of the 3,000*l.* authorised by the Council, and recommended that the amount to be expended be increased to a sum not exceeding 4,250*l.* The Report, after some lengthy consideration, was adopted, subject to the designs being according to the published conditions; and the Technical Education Committee were authorised to select a design for the proposed school and to proceed with its erection at a cost not exceeding 4,250*l.* It was further decided to allow the plans to be open for public inspection.—*Birmingham Gazette.*

WESLEYAN CHURCH, WESTHOUGHTON.—The designs of Messrs. Halsall, Tonge, and Campbell, 120, Lord-street, Southport, have been placed first in a competition for a new Wesleyan church at Westhoughton (Bolton).

HARROGATE TOWN HALL.—The assessor in the above competition (Mr. Macvicar Anderson) has given his award as follows, and it has been adopted by a committee, subject to confirmation by the Council:—*1st Premium*, 150*l.*—Mr. Henry T. Hare, 13, Hart-street, Bloomsbury-square, London. *2nd Premium*, 100*l.*—Messrs. Waddington, Sons, & Dunkerley, 53, Victoria-street, Westminster. *3rd Premium*, 75*l.*—Messrs. Heazell & Son, Parliament-street, Nottingham. The whole of the drawings will be on view in the Promenade Room, Swan-road, between 10 a.m. and 5 p.m., from the 18th to the 25th inst. (Sunday excepted).

BOOKS RECEIVED.

PIPES AND TUBES: THEIR CONSTRUCTION AND JOINTING. By Philip R. Bjorling. (Whittaker & Co. 3*s.* 6*d.*)

PRINCIPLES OF ARCHITECTURAL PERSPECTIVE. By W. H. Lawrence. Second edition, revised. (Alfred Mudge & Son: Boston, U.S.A.)

LINE AND FORM. By Walter Crane. (Geo. Bell & Sons. 6*s.*)

HISTORY OF BURLEY-ON-THE-HILL, RUTLAND.—By Pearl Finch. (John Bale, Sons, & Danielsson. 2*l.* 2*s.*)

LE MIROIR DE LA VIE: Essais sur l'Evolution Esthétique. By Robert de la Sizeranne. (Hachette: Paris.)

Correspondence.

THE BRITISH FIRE PREVENTION COMMITTEE'S NEW ARRANGEMENTS FOR BUSINESS MEN.

SIR,—The terrible fire in Queen Victoria-street, following so shortly upon the Hackney fire, where seven lives were lost, and upon the Barbican conflagration, where so much property was destroyed, has led many City firms to communicate with the British Fire Prevention Committee either for the purpose of mutual co-operation or with the view of obtaining advice; and we hence inform you that special arrangements have now been made by which the industrial and commercial establishments of the Metropolis can benefit from the results of the Committee's investigations, which have so far only mainly served the purpose of assisting the members of the technical professions.

A special Industrial section (the scheme for which has already been under consideration for some time) has now been started in connexion with this Committee, and is open to all firms of ordinary business standing as well as to responsible representatives of such firms.

The main objects of the Fire Prevention Committee—as we believe is generally known—refer primarily to the protection of life and property from fire by the adoption of *preventive* measures. The Committee uses its influence in every direction towards minimising the possibilities and dangers of fire, to bring together those scientifically interested in the subject and to arrange periodical meetings for the purpose of discussing practical questions bearing on the same. The Committee's scope includes *independent* testing of fire-resisting materials, methods, and appliances, no less than sixty of such tests having been undertaken since its incorporation. Papers on the subject are published periodically, no fewer than sixty-eight of the Committee's Red books having been issued.

To meet the particular requirements of business men with regard to the better protection of life and property from fire, the special Industrial Section now formed will mainly deal with every-day practical requirements of the community rather than with the research side of the question, and the programme of this Industrial Section may be summarised as follows, namely:—

1. To assist the movement for better fire protection inaugurated by the Committee, having special regard to the advantage of practical preventive measures.

2. To bring together those interested in the management of offices, works, factories, mills, refineries, warehouses, &c., in order that special facilities for obtaining immediate information shall be available to all concerned:—(*a*) as to the requirements of Public Authorities, (*b*) as to approved methods of construction and equipment, (*c*) as to tests or experiments with fire-resisting materials or fire appliances, (*d*) as to the experience gained at actual fires, and (*e*) as to the organisation of fire watches, private fire brigades, &c.

3. To afford facilities for combined action in respect to the requirements of the Public Authorities.

4. To arrange periodical meetings for the purpose of discussing practical questions bearing on the subject, to publish and distribute such papers as are of special interest to members of the Section, and to form such collections of models, appliances, records, and statistics as may be useful for reference.

5. To issue periodical warnings and notices to members, calling attention to specific risks or safeguards.

Each firm joining the Section will be represented by one person, who shall either be a principal, a director, manager, secretary,

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or skilled adviser to the firm in question. Individual principals, directors, &c., are, however, eligible as members quite apart from the membership of their firm, but at no time shall more than three members of the same firm belong to the Section, and for all resolutions relating to the business of the Section, no one firm shall have more than one vote.

The annual subscription for every firm or individual becoming a member has been fixed at two guineas per annum, but for any individual member whose firm is already associated with the section the subscription will be one guinea per annum. The Committee's auditors include Mr. James (Messrs. James & Edwards), President of the Institute of Chartered Accountants, and all members of the Committee give their services voluntarily.

The section will elect its own Chairman and Vice-Chairman, who will also have seats on the Council of the General Committee, where they will represent the section in all matters relating to its particular interests.

We think that the scientific side of the Committee's work has been successful and of value to the members of the professions for whom it was originally mainly intended, and we hence trust that the many City firms interested will also now be able to likewise benefit from practical application of the Committee's labours.

We believe that if the business men were to look upon questions of safety from fire in the same way as they realise the importance of attending to questions of hygiene, they would soon—partially by self-help and partially by using their influence with the authorities—be able to rely on that measure of security both for life and property as they to-day enjoy and are officially safeguarded against in respect to bad drainage and its effects.

EDWIN O. SACHS, Chairman.
ELLIS MARSLAND, Hon. Secretary.
Offices of the British Fire Prevention Committee, 1, Waterloo-place, Pall Mall, S.W.

CHARING CROSS, EUSTON, AND HAMPSTEAD RAILWAY BILLS, 1902.

SIR,—The Hampstead Heath Protection Society desire to call public attention to their attitude with reference to the above Bills. They opposed these Bills before the Committee of the House of Lords so far as the Bills propose to sanction tunnelling under any part of the Heath, but the Committee declined to admit their *locus-standi*, and refused to permit their counsel to argue the question.

The only course now left open to the Hampstead Heath Protection Society is to take action with a view to ensure a discussion on the Bills when they come before the House of Commons for second reading.

They remain convinced that notwithstanding any clauses, however stringent, which may be inserted in the Bills, the construction of an underground railway under the Heath must necessarily lead sooner or later to communications with the surface, either for the purposes of ventilation, or for stations, or for both, which will cause irreparable injury to the Heath.

They urge further that Parliament should, in accordance with the recommendation of the Board of Agriculture made in their Report of February 25, 1902, require the promoters of the railway to show that it is impossible that any material injury to the surface of the heath will be caused by the proposed railway.

EMILY FIELD,
HENRY F. POOLEY,
Hon. Secs. to the Hampstead Heath Protection Society.

*** We hope that any of our readers who have any influence in Parliament or otherwise will do their best to support the Hampstead Heath Protection Society. The running of a railway under the heath, with the inevitable stations, be will the commencement of the destruction of the present character of Hampstead Heath.—ED.

BROADLANDS, SUNNINGHILL. — This freehold estate, comprising 90 acres, with a park, a cricket ground, a model farm, and some cottages, near Ascot and Sunningdale, will be offered for sale at auction in the course of July. The house was erected after plans and designs by Mr. R. Norman Shaw, R.A., and contains twenty-six bed and dressing rooms, a winter garden 42 ft. long, and a spacious ballroom measuring 60 ft. by 56 ft., and 20 ft. in height.

The Student's Column.

PART III.—PRIVATE SEWAGE DISPOSAL.

CHAPTER 24.—DISPOSAL ON LAND (*continued*), AND CHEMICAL TREATMENT.

FOR crude sewage, from which only the heavy and coarse matters have been extracted in detritus and screening tanks, land is usually laid out (for intermittent filtration) on the ridge-and-furrow system. The arrangement is very different from that adopted for broad irrigation and known by the same name. The furrows are much deeper and wider, as shown in fig. 98. They may be about 12 in. or 15 in. deep, and from 12 in. to 18 in. wide at the bottom, with slopes of 1 in 1½. The tops of the ridges may be 2 ft. or 3 ft. wide. The sewage is run into the furrows in such a quantity that the depth does not in any place exceed (say) 6 in. Roots, cabbages, &c., are planted on the ridges, and absorb a considerable portion of the sewage. The remainder filters downwards to the underdrains, which may be from 5 ft. to 6 ft. deep and 20 ft. or 30 ft. apart. If the soil is porous to a great depth, the underdrains are sometimes omitted. Clay soil is useless for filtration. The sewage either remains in the furrows, or passes directly through cracks and holes to the drains, without purification.

Intermittency of application is essential to the success of filtration through land. The sewage must be allowed to drain away, and the pores of the soil be thoroughly aërated, before another dose is applied, and longer periods of rest must also be given. At Stratford-on-Avon the sewage of 9,000 persons is treated on nine acres of open sandy gravel, half of this area being laid out into ridges and furrows. This portion is divided into eight beds, each of which is subdivided by ridges into four quarters. The sewage is pumped from a tank for ten hours each day, and is applied to the four quarters intermittently for a week. This bed then rests for six weeks, while other beds are being irrigated. Every year the ridges and furrows are levelled, and the other portion of the area prepared for filtration.

At Fonthill, East Grinstead, the sewage from a school of about eighty persons was treated under the direction of Mr. Bailey Denton, on an area of three-quarters of an acre, one-third of which was laid out for filtration, and the remainder for broad irrigation. The sewage is collected in a tank, and discharged by raising a penstock once or twice a day. A high-level overflow is provided, communicating with the drain leading to the disposal area, so that even if the penstock is not raised the sewage passes on to the land. Vegetables are grown on the ridges of the filtration area, and roots for the consumption of stock on the irrigation area.

The same engineer carried out a similar scheme for the Berkshire Lunatic Asylum at Moulsford. In this case the sewage from 600 to 800 persons has been successfully treated on 1¾ acres of deep porous soil, laid out into eight filtration areas. The subsoil here is of porous sand and gravel, and underdrains were therefore not considered necessary. The sewage simply filters downwards into the subsoil-water, and cannot conveniently be collected after filtration for purposes of analysis.

The sewage may be discharged automatically from a tank by means of a syphon. It must be diverted to different areas by means of small stops, which may be fitted into grooves in the walls of brick chambers after the manner shown at B in fig. 92. The furrows in each area must be of sufficient capacity to receive the whole of the discharge without flooding the vegetation, and each system of furrows must be complete in itself, without overflow or communication with any other area.

For sewage which has been partly purified by precipitation, or by bacterial treatment in tanks followed by artificial filtration, the land may be laid out into level filtration areas, each surrounded by an earthen ridge or embankment. The sewage is run on to each bed in turn. Similar beds are often used for the rough filtration of storm water, and at one time it was a common practice to plant osiers over such storm-water areas.

Even where broad irrigation is adopted, it is a good plan to provide a number of filtration areas to be used when the state of the crops on the irrigation land is such that sewage cannot be advantageously applied.

There is no doubt that intermittent downward filtration through land can, in many cases, be conveniently and satisfactorily adopted for the purification of sewage, but we have already seen that under unfavourable circumstances very little purification indeed is effected. In comparing it with broad irrigation, we may quote Dr. Rideal, who thus summarises the main faults of irrigation with raw sewage :—

"(*a*) Choking and felting of the surface with organic slime.

(*b*) A surplus of unprepared organic matter, and of ammonia, over the wants of the plants.

(*c*) In consequence of the above, a deficiency of oxygen and of healthy action in the body of the soil.

(*d*) Great inconstancy owing to season, temperature, and cultivation."

He adds that the faults (*b*) and (*c*) are avoided "to a certain extent" in intermittent filtration through land with copious underdrainage.

The drains, if properly arranged, not only carry off the filtrate, but also serve as aërators, supplying the soil more thoroughly with oxygen, and thus "allowing nitrification to proceed more actively."

CHEMICAL TREATMENT.

A thousand and one patents have been taken out for the chemical treatment of sewage, but very few have proved to be of much practical value. For town sewage, containing trade refuse of a strong character, chemical treatment is undoubtedly necessary, in order to precipitate a large portion of the solids, and also in many cases to neutralise the acids in the sewage. The precipitant most commonly used is lime. This is slaked and ground in sewage or water to the consistency of cream or milk. It should be added to the sewage in the channel leading to the tanks, the proportion varying from about 5 to 15 grains of lime per gallon of sewage. Sulphate of alumina is also often used, a well-known variety (containing a small proportion of sulphate of iron) being known as alumino-ferric. These chemicals, however, do no more than clarify the sewage. The effluents from the precipitation tanks, although less foul than the original sewage, are still liable to decompose, and further purification is therefore necessary. This may be effected on land in one of the ways already described, or by some method of artificial filtration Chemical treatment of this kind is expensive, and results in the deposition of a large volume of sludge, which is often difficult to get rid of It is now known that domestic sewage, and even town sewage containing a moderate proportion of trade refuse, can be purified by bacterial agency, and it is not likely that chemical precipitation will in the future be often adopted for private sewage-disposal works, where only domestic sewage has to be treated.

A more interesting form of chemical treatment is that based on the researches of Dr. W. E. Adeney, of the Royal University, Dublin, and practically applied by the Oxygen Sewage Purification Co., under the direction of Mr. W. Kaye Parry and others. This system is devised to assist the bacterial changes in sewage by the addition of chemicals, and is not therefore a mere precipitation process. The following account of it is condensed from the evidence given by Dr. Adeney to the Royal Commission on Sewage Disposal. The two conditions of primary importance in the purification of sewage are :—(1) A very large and continuous growth of bacteria, and (2) a constant and adequate supply of oxygen for their use. The oxygen may be obtained from the air, as in natural and artificial filtration, where the pores of the filter contain a store of air in close proximity to the surfaces on which the bacteria may grow. Dr. Adeney suggests that oxygen may be supplied to the sewage by means of chemicals in addition to that furnished by the air; thus, the insoluble higher oxides of manganese may be employed for furnishing the necessary oxygen for the aërobic fermentation of the *suspended* organic matters, and small quantities of nitrate of soda may be used for supplying oxygen to effect a similar purification of the *dissolved* organic matters. When compounds of manganese are employed for clarifying the sewage, sludges are obtained which, when drained and kept in heaps, undergo slow aërobic bacterial fermentation, resulting (in the presence of a sufficient quan-

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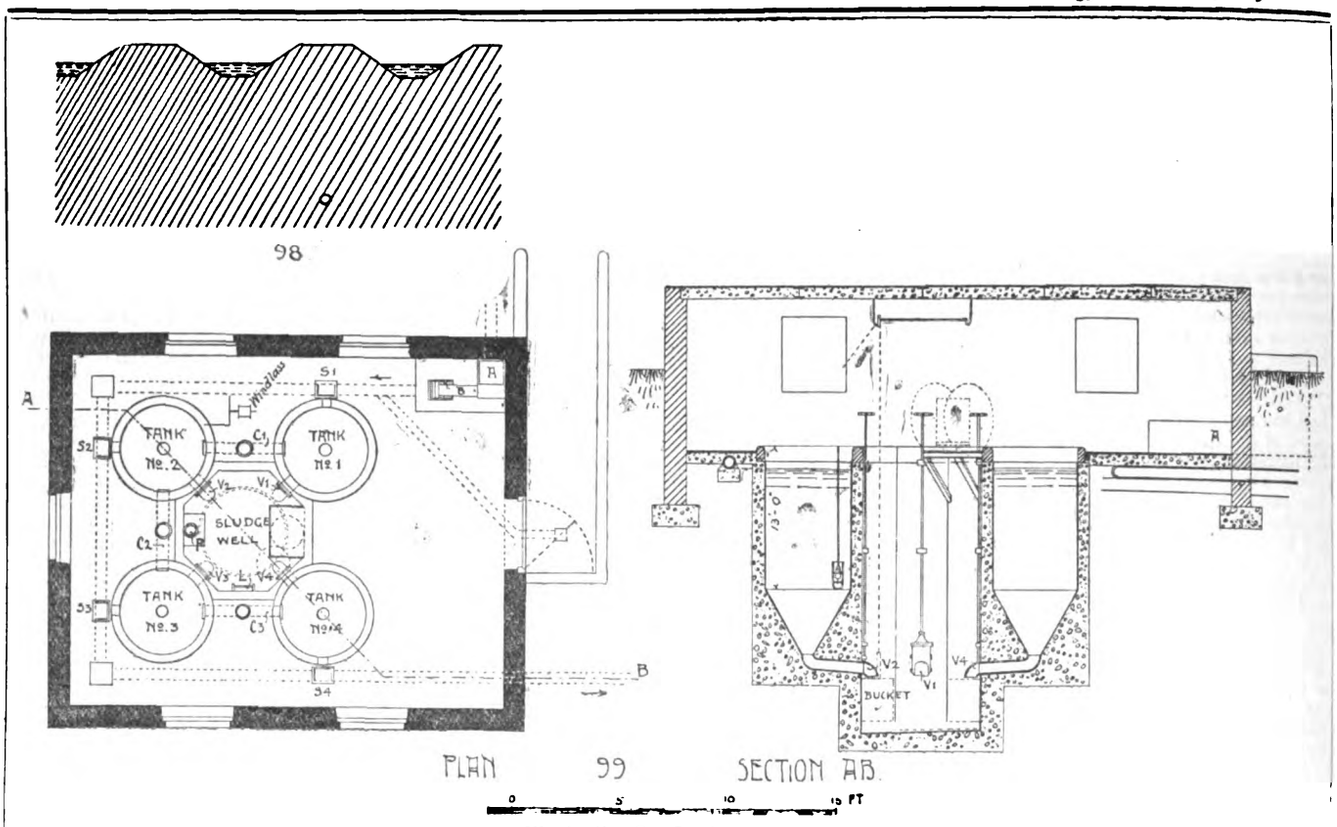

Illustrations to Student's Column.

tity of peroxide of manganese) in the complete fermentation of the solid organic matters in the sludge. The process, therefore, is a somewhat complex one, supplying oxygen in two forms, the one for the purification of the sludge and the other for the purification of the sewage from which the sludge has been deposited.

The installation of this system at the Chapelizod Police Barracks, co. Dublin, is shown in fig. 99. The works are designed to purify a quantity of sewage not exceeding 1,200 gallons a day. Four circular tanks, 4 ft. in diameter, of the Dortmund type, are built around an octagonal sludge-well. The sewage flows through the straining-chamber A and over the wheel B, which regulates the supply of the chemical reagent (known as "oxanite"), and can be diverted by the sluice marked S_1 into tank No. 1, from which it passes through a low-level communicating-pipe (C_1) into tank No. 2, and rising to the surface, overflows into the sluice-box (S_2) at the same level as it entered No. 1. The other tanks are similarly arranged; any one tank can be cut out of the circuit by means of the valves and sluices when it requires cleaning. The communicating-pipes are furnished with circular inspection-eyes covered with gratings. Each tank has a conical bottom, communicating with a 6-in. iron pipe (V_1, V_2, &c.) leading to the sludge-well, this pipe being fitted with a sluice-valve. To receive the sludge a bucket is lowered by a differential pulley, travelling on a circular overhead rail (shown by dotted lines on the plan) so that the bucket can be hung under any one of the four sluices. On the valve being opened the thickest sludge from the bottom of the tank passes out, and when the bucket is full the sluice is shut down, and the bucket raised to the surface. All the work is performed from the floor level, and it is found that only one bucketful has to be removed each day. The sludge is air-died, and used in the garden of the barracks. If a tank has to be emptied it is cut out of the circuit, and the contents are run into the sludge-well and pumped therefrom by means of a chain-pump, P. A ladder, L, affords access to the bottom of the sludge-well. The whole of the apparatus is contained in a chamber measuring 20 ft. by 16 ft. inside, the height from floor to ceiling being only 7 ft. Ample light is provided by means of five windows and five top lights. The tanks are rendered inside with Medina cement.

The effluent from the tanks at Chapelizod Barracks is not filtered in any way, but in most cases further treatment will undoubtedly be necessary. Dr. Adeney states that the addition of nitrate of soda to the tank effluent, in the proportion of one-half to two grains per gallon, is quite sufficient to produce "a most satisfactory effluent from any ordinary town-sewage—an effluent in which, when kept in corked bottles, aërobic fermentation is rapidly completed, and in which no putrefactive fermentation takes place." The nitrate of soda must be added to the sewage after this has been clarified, and as it passes from the precipitation tanks to the biological tanks. These tanks, he adds, should be worked continuously to ensure the constant presence of a large and active bacterial growth, and open networks of porous material should be built in them to provide ample surfaces upon which the bacteria may grow and accumulate.

GENERAL BUILDING NEWS.

THE BAR-GATE, SOUTHAMPTON.—Mr. R. Macdonald Lucas, of Southampton, has been appointed consulting architect in respect of the works for widening the roadway at the junction of High-street and Above-bar, Southampton. In our number of October 12 last, we published a description of the scheme prepared by Mr. Lucas for increasing the traffic facilities of the street whilst preserving the building which now serves for the town hall, as the chief gateway of the town, together with numerous illustrations, and a plan showing the two elevations of the Bar-gate with the effect of the proposed alterations.

EXTENSION OF BATHS, BIRMINGHAM.—The new swimming and private baths, forming the extension to the public baths in Woodcock-street, were opened on the 12th inst. The new swimming bath is 81 ft. long and 30 ft. wide, and leading from it are forty-eight private dressing-rooms, the openings to which are formed of terra-cotta courses, mouldings, and arches. The roof is supported on ornamental cast-iron ribs, and the bathroom is lighted by the introduction of a Muranese glass roof, in addition to a large window in each gable-end of the building. The private bath departments consist of eighteen separate bathrooms, divided into three sections, and the floors are laid with mosaic terrazzo paving, with ornamental borders throughout, excepting in the case of the promenade round the swimming bath, where a special border of ribbed adamantine tiles, 2 ft. wide, has been laid next to the kerbstone, in order that bathers may get a good foothold. A special needle and shower bath has also been provided, with the usual lavatory accommodation. The estimated cost of the buildings as sanctioned by the City Council was 11,000*l.*, which included 800*l.*, the cost of sinking a new bore-hole from the bottom of the existing well for the purpose of obtaining an additional supply of water to meet the demand caused by the extensions. The cost of engineering work, included in the sum mentioned, amounted to 950*l.* The buildings have been erected by Messrs. John Bowen & Sons, of Balsall Heath, from designs prepared by Mr. F. W. Lloyd, architect, of Birmingham.

ADDITIONS TO INFIRMARY, HUDDERSFIELD.—A new wing of the Huddersfield infirmary was opened on the 11th inst. The cost, including a nurses' home, mortuary, isolation wards, &c., is estimated at 22,328*l.* Mr. B. Stocks, of Huddersfield, was the architect.

FORESTERS' HALLS, DUNDEE, N.B.—The suite of halls which the Foresters' Friendly Society has erected in Dundee was formally opened on the 18th inst. The buildings are situated in Nicoll-street and Rattray-street. They occupy a site behind a large block of business premises fronting Ward-road, and for the purpose of public meetings they are suitably placed. The main features of the buildings are a large hall capable of accommodating 1,100 persons, two smaller halls with a capacity of 300 each, a large room for Society purposes, and a number of smaller rooms, which can be used as committee and cloak rooms. The main entrance is from Nicoll-street, and a large open doorway leads into a vestible, from each side of which staircases communicate with the large hall on the first floor. The stairs are continued up to the balcony, which runs round the hall on three sides. At the front the balcony spreads out into a wide gallery, at the back of which are windows and alcoves on each side. The platform has been so constructed that it can be extended or contracted as required. The fittings are of pitch pine, while the ceiling and walls are decorated in a warm brown colour. Round the edge of the balcony runs an iron railing with an aluminium top, and the railing is set out in gilt and spaced at intervals with polished copper shields. There are several ante-rooms for all parts of the hall. The smaller halls enter from Rattray-street. They are adaptable for meetings, the forms being collapsible, and thus easily removed when floor space is required. The front seats of the large hall are also reached from Rattray-street. What is known as the society-room is a spacious apartment intended for the meeting of trade and friendly societies, and has ante-room accommodation. There is also a suite of rooms for reading and recreation, and it is intended to make the rooms a common meeting ground for the members of all friendly societies in the city. In addition to the public accommodation, the halls include rooms for administrative purposes, such as kitchen and storerooms. The halls are heated by hot water, and are lighted by electricity. The total cost is upwards of 8,000*l.* Messrs. Johnston & Baxter, of Dundee, are the architects.

BUSINESS PREMISES, BELFAST.—The business premises of Messrs. W. A. Ross & Sons, Ltd., have recently been considerably extended. The additions consist of an extensive store and a block of offices, which make the total ground space occupied by the premises about 14,000 square feet. Their premises have now a frontage to Montgomery-street of 166 ft., and to William-street South of about 80ft. The buildings are on piled and massive concrete foundations, and the construction of the factory is of brickwork, with steel girders, columns, &c. The office block, which faces William-street South, is a modified treatment of English Renaissance. The façade consists of Laganvale brick, with dressings

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of Dumfries red stone from the Annan quarries. It is flanked on either side by low square towers covered with ornamental lead roofs. The central feature of the front is a gable terminating with a circular pediment. The building has a granite plinth from Castlewellan quarries, and the front from ground to first floor level, is rather more classical in style, having pilasters and massive entablature in stone, with the name of the firm carved on the frieze. The new offices, which communicate with the factory building on each floor, have the hall, passages, &c., on the ground floor paved with marble terrazzo mosaic, and they have throughout a pitch pine wainscotting. The office accommodation consists of a large general office on the ground floor, with lavatories, cloakroom, &c., strongroom, and spacious halls and passages. On the ground floor are the Directors' boardroom, counting-house, and private offices, while the second floor will be utilised for stationery and showcard departments. The ground floor is set apart for the despatch of goods. The builders were Messrs. M'Laughlin & Harvey, Ltd.; the plumbing work was executed by Mr. W. A. Willis; the strongroom door, &c., by Messrs. Milner, Ltd.; the grates and chimney-pieces by Messrs. Richard Patterson & Co.; and the mosaic flooring by Ebner & Co. The architects were Messrs. Graeme-Watt & Tulloch, of Victoria-street, Belfast.

WESLEYAN CHAPEL, COPPULL, LANCS.—On the 11th inst. the foundation stones of this building were laid. The buildings will consist of a church, vestry, schoolroom, infants' room, three classrooms, kitchen, &c. The front elevation of the church is set back 36 ft. from the road, and there is to be a central front entrance porch. The rostrum and communion are at the other end, and immediately behind the rostrum will be the orchestra, connected with the church by a moulded arched opening. The schoolroom and classrooms are to be at the rear, and will have direct communication with the church. The classrooms abut on the schoolroom, and two will be provided with movable partitions to allow of their conversion into one room for assembly purposes. Arrangements are being made to enable the construction of an end gallery at the front of the church as occasion requires. The rostrum and orchestra fronts are to be treated so as to give a light and effective appearance, being formed of panelled and moulded pitch pine framing. The roofs internally are to be partially "open," with visible timbers stained and varnished. Inside, the walls and the ceilings will be plastered. All internal joinery is to be of pitch pine and varnished, and the pews will be of the open style. The buildings will be faced externally with patent pressed bricks, relieved with Yorkshire stone dressings, and the windows to the church and orchestra will be glazed with lead lights. Low hot-water pressure is to be used for the heating. The church will provide accommodation for about 290 adults, or a mixed congregation of about 350 persons, and the school and classrooms will seat about 330 scholars. Mr. W. Hampson, of Chorley, is the contractor, and Mr. W. H. Dinsley, of the same place, the architect.

COUNTY COUNCIL OFFICES, NEWPORT, MON.—On the 11th inst. the Monmouthshire County Council formally opened their new offices, which have been erected at a cost of 10,000*l.* on a site adjacent to the present offices and the county police premises at Pentonville, Newport. The style of the building is Renaissance, and the materials used in the façade, which is 80 ft. in length, is Pennant stone, with Grinshill dressings. The seal of the Council in carved stone occupies the central pediment; the date finds a place in the lower portion, and the memorial stone, laid last year, is beneath the window of the chairman's private room. A flight of steps leads to the main entrance and corridor. The latter is laid with mosaic floor, and gives access to the Council Chamber, which is octagonal in shape, 36 ft. by 36 ft. and 26 ft. in height. All the members' seats face the chair. The furnishing and fittings of the chamber are in oak and red leather, and the floor covering is also in dark red. There is an electric fan in the turret to ventilate the chamber, which is lighted by electricity. There is also a members' room, chairman's private room, two committee-rooms, and rooms for the Clerk of the Peace, for the Chief Clerk and other officials, and two strong rooms below. All the doors and joiners' work throughout the entire building are of oak, dull polished. Messrs. Waring, of London, furnished the Council Chamber, and Messrs. Reynolds, of Newport, the offices and committee-rooms. Mr. D. W. Richards, Newport, was the builder, and the plans were prepared by Mr. W. Tanner, County Surveyor.

HOME FOR EPILEPTICS, MAGHULL, LIVERPOOL.—The Harrison Home for Epileptics at Maghull, Liverpool, was formally opened on the 14th inst. It is situated at the corner where Sefton-lane leaves the high road from Liverpool to Ormskirk, and has its lower story built of light red bricks with terra-cotta heads and sills, while the walls above this are covered with rough cast, and under the eaves of the red-tiled roof is a large cornice of wood enriched with medallions. The stone entrance-porch is flanked on each side by two Tuscan columns, carrying an entablature and curved pediment, and in the gable above is a tablet recording the name of the donor and date of erection. On the ground floor there are a dining-room and a billiard-room, each 26 ft. in length, also a drawing-room and secretary's office, all facing the garden and park, and provided with direct access to them, while on the other fronts are lavatories, kitchens, and a writing and reading-room. The sanitary blocks at the end of each wing run up through the three floors, and are completely cut off by cross ventilated lobbies from the rest of the building. The two staircases are of American white wood, stained green and French polished. The drainage is on the bacterial system, with alternating aërating beds. The building has been designed by Messrs. Willink & Thicknesse, architects, of Liverpool; and the builders were Messrs. Brown & Backhouse, of Liverpool.

SCHOOL BUILDINGS, ABERDEEN.—The Plans Committee of Aberdeen Town Council at its meeting on the 12th inst. sanctioned the plans of the new Central Higher Grade Public School and Pupil Teachers' Institute to be erected by the Aberdeen School Board at a cost of upwards of 25,000*l.* The site is at the corner of Schoolhill and Belmont-street. The plans have been prepared by Mr. J. A. O. Allan, architect to the School Board. The design is Renaissance in character, modelled on lines to harmonise with the buildings in the vicinity, as, for instance, the Art Gallery, Gray's School of Art, and the entrance gateway to Robert Gordon's College, all of which are immediately opposite the Schoolhill front. The existing central school, which fronts Little Belmont-street, and has 489 places, will, on the erection of the new building, form the elementary part of the school, with which it will be connected by a corridor. In the new building there will be ordinary classroom accommodation for 600 pupils.

MISSION HALL, EASTBROOK, BRADFORD.—The foundation-stones of a mission-hall, which is in course of erection on the site formerly occupied by Eastbrook Chapel, Bradford, were laid on the 14th inst. The building will be arranged on a plan similar to that of the Central Hall in Manchester-road, Bradford. On the ground floor facing Leeds-road and Chapel-street there will be a row of shops with offices above, and the mission-hall will be situated between these and the school premises in the rear. The hall will be octagonal in shape, and will be arranged on the amphitheatre principle, every seat being in full view of the platform. A spacious gallery will extend round the building except on the side occupied by the platform. Behind the platform will be seats for the choir and orchestra, and still further in the rear a recess, in which will be placed the organ removed from the old chapel. The main entrance will be in Leeds-road, whence a corridor 20 ft. wide will lead to a large vestibule with doors, giving acces to the floor of the hall and the stairs leading to the gallery. Seating accommodation will be provided for about 2,000 people, and in addition to the large hall the premises will contain a minister's vestry, sisters' room, men's rooms, and young women's room, together with several class-rooms, and a room for the choir and band. The architects are Messrs. W. J. Morley & Son, of Bradford.

CLUB PREMISES, RIPPONDEN, YORKS.—The memorial stones of the new Liberal Club building which is being erected in Ripponden were laid on the 14th inst. The building will occupy a central position opposite the junction of Oldham-road and Rochdale-road. The architect is Mr. W. C. Williams, of Halifax.

SANITARY AND ENGINEERING NEWS.

SUSPENSION BRIDGE, STANHOPE, DURHAM.—This bridge, which has been erected over the River Wear, near Unthank Hall, has a span of 86 ft. Each of the standards are fixed in concrete, and strengthened and armoured by galvanised steel angle bars made by Messrs. Bartram & Sons, South Dock, Sunderland. Standards, platform, handrail, and palisade are of Haskinised pitch-pine. The steel wire galvanised cables and under girders and lattice, together with the galvanised iron clamps and suspension rods, were manufactured by Messrs. Glaholm & Robson, of Hendon Patent Ropeworks, Sunderland, while Mr. William Davison, of Southwick, was the builder. Mr. Frank Caws, of Sunderland, was the engineer.

DRAINAGE SCHEME, CHIPPENHAM.—At a special meeting of the Chippenham Town Council on the 13th inst the Surveyor, Mr. A. E. Adams, laid his plans before the Council, and said he proposed to convey the sewage to an outfall near the Rifle Butts, in Little England, where it would be treated by the bacteriological process. There would be two systems of sewers on each side of the Avon, a high-level sewer and a low-level sewer. The former would gravitate four-fifths of the sewage to the outfall, whilst the other one-fifth would be conveyed by the low-level sewer. After being treated, the sewage would be conveyed through Mortimer's Wood, and the effluent would run on to a suitable piece of land beyond the borough boundary. It was arranged that the sewers should be capable of receiving six times the normal flow of sewage. The works would be capable of dealing with a maximum flow of 412,500 gallons per twenty-four hours, and the sewers throughout would be self-cleansing. He estimated the cost of the works at 12,000*l.* The upkeep would not be more than 100*l.* a year. It was decided to adopt the plans as presented, and to apply to the Local Government Board for powers to borrow the necessary money.—*Bristol Mercury.*

STAINED GLASS AND DECORATION.

MEMORIAL WINDOWS, WESLEY'S CHAPEL, CITY-ROAD.—For the Bishop Simpson memorial window a design representing St. Paul preaching in Athens has been prepared by Messrs. Mayer & Co., of Munich, London, and New York. The window, being the fifth of a series executed by that firm, is subscribed for by American Methodists, who are dissatisfied with the present window to the memory of Bishop Simpson.

THE FORBES MEMORIAL, ST. PAUL'S CATHEDRAL.—The memorial which has recently been set up in the crypt of St. Paul's was subscribed for by friends of the late Archibald Forbes, during thirty years war correspondent of the *Daily News*, who died at his residence in Clarence-terrace, Regent's Park, in 1900. The tablet, designed by Mr. H. H. Edwards, is executed in Brazilian onyx, set in a rectangular bronze border, 4 ft. by 3 ft., of laurel tied with silver ribbons. A central wreath of olive and laurel surrounds a portrait bust, executed in bronze by Mr. H. C. Fehr, surmounted by the badge of the Iron Cross of Germany—a unique distinction bestowed upon Archibald Forbes after the Franco-Prussian war. The tablet was made by the Art Memorial Co., of West Norwood.

MEMORIAL WINDOW, CLIFTON, BRISTOL.—A large stained-glass window is to be erected by the parishioners and congregation of Emmanuel Church, Clifton, in memory of the late Canon and Mrs. Brenan. At a recent meeting of the Memorial Committee it was decided to accept the design submitted by Messrs. Joseph Bell & Son, of 12, College Green, Bristol. The window, which consists of three lights and tracery, will represent various scenes from the life of St. Paul. The subject which forms the main portion of the design is St. Paul declaring to the citizens of Athens "The Unknown God," to whom they erected an altar. Beneath the group are three smaller subjects illustrating "St. Paul before Bernice and Agrippa," "St. Paul Shipwrecked," and "St. Paul Bitten by the Viper."

FOREIGN.

INDIA.—The North-Western Railway Co. of India has appointed a tunnel inspector, whose duty it will be to examine all the tunnels on the frontier section once per month.——A new station at Kiul, on the East Indian Railway, is shortly to be opened.——About fifty miles of the North-Western Railway near Karachi have been severely damaged by floods. The water rose above several of the bridges, and was 6 ft. above rail level.——The Indian Government has sanctioned the following reductions in the accommodation at present authorised for European troops in single men's barracks at stations in the plains, viz.:—1. Walls: height to be reduced from 20 ft. to 16 ft. 2. Day rooms: superficial area per man to be reduced from 30 ft. to 20 ft. 3. Verandahs: width to be reduced from 12 ft. to 10 ft.——Simla is beginning to suffer from a water famine, the rainfall having been very little during the past few months.——The new barracks at Kirkee are estimated to cost 119,000 rupees.——The Barun-Daltonganj branch of the East Indian Railway has now been opened. The palace buildings at Delhi have been handed over to the Punjab Public Works Department for maintenance.——The Badagara-Tellicherry section of the Calicut-Azikhal extension of the Madras Railway has been opened for traffic.——The Government of India has sanctioned the proposal for the municipal pipe water-supply to the cantonment of Naini Tal.

AUSTRALIA.—The competition for premiums offered for the best design for a town hall at Hay, New South Wales, has been adjudicated upon, and the first prize has been awarded to Mr. John Little, of Melbourne, the secretary of the Royal Victorian Institute of Architects.——A cable station is to be erected at Southport, Queensland, in connexion with the landing of the Pacific cable. The estimated cost is 4,500*l.*——A large convent for the Sisters of Charity is to be erected in Grey-street, East Melbourne, at a cost of 10,682*l.*

MISCELLANEOUS.

CORONATION WEEK.—In consequence of the holidays next week we go to press on Tuesday. All communications for the Editor must reach him by *first post on Tuesday morning*, except lists of tenders, which will be received up to 10 a.m. of the same day.

HOUSE, WEST GREEN, WINCHFIELD.—In consequence of Mr. Newton's absence from home we received too late for publication last week the following short description of the house at West Green, Winchfield, illustrated in our last issue:—"The house is built entirely of hand-made red bricks, and the roof is covered with old hand-made tiles. Sun shutters are fixed to the sitting-room windows; these windows are sashes, so that they may be opened behind the shutters.

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The contractors for the work generally were Messrs. Mussellwhite & Son, of Basingstoke. The glazing and casements are the work of Messrs. Wenham & Waters, of Croydon." We should add that only one of the drawings is hung at the Royal Academy, not both of them, as stated in our last.

ASBESTOS SLABS FOR BUILDING PURPOSES.—We have received from Messrs. Wallach Bros., of Gracechurch-street, London, some samples of a new asbestos composition intended for use in the construction of partitions, roofs, and fireproof shutters in buildings. The slabs are intermediate in hardness and brittleness between millboard and ordinary tiles. They can, of course, be manufactured of any size or thickness. We have heated the samples submitted to us to a red heat for some time, and, beyond becoming somewhat more brittle, they appear little the worse for the treatment. Upon immersion in water the material effervesces a little, but is apparently uninjured, and no disintegration is observable, even after prolonged immersion. It is claimed that the material is waterproof as well as fireproof. So far as an opinion can be formed from a superficial examination, the slabs appear decidedly superior to most of the compositions of a similar character already on the market. If its price be not prohibitive, architects and builders should give the new material a trial, since it may be serviceable for special circumstances, even if it be not fitted to replace generally the materials at present commonly used for partitions, roofs, and walls.

THE HOUSING QUESTION, GATESHEAD.—In his report for last year, which has recently been issued, Dr. R. Green, Medical Officer of Health for Gateshead, says:—It is often discussed whether slums make slum-dwellers, or the opposite holds good, but in several parts of the town quite new property is rapidly becoming worse than much of the old. In my opinion, some of the new flats in the St. Cuthbert's-road district, and also Rawling-street, are practically cellar-dwellings, at least in front. The latter are blocked at the back by the steps of the upper flats, and the only part of the outer world visible from them is the sky. Through ventilation is quite impossible in such houses. The system in vogue of the waste slop-pipes of upper flats emptying into the gully in the yard of the ground flat is a decidedly dangerous one. Infectious material from the upper flat may easily be sent into the yard of the lower one, and, if the gully is ever obstructed, may be scattered about the yard. This seems a very possible way for the spread of scarlet fever from one flat to another, as in several such cases no personal contact was discovered. The competition for new houses is so keen that in very many cases they are occupied whilst still very damp which is a direct danger to health. In my opinion no house should be let until a certificate is given of its dryness and general fitness for occupation.

IMPROVEMENTS AT BRIDLINGTON. — A Local Government Board inquiry has recently been held at Bridlington concerning the application of the Town Council for sanction to borrow 1,300*l.* for improvements in South Cliff-road, Hilderthorpe. The Corporation is also seeking powers to borrow 650*l.* for the purpose of carrying out improvements at the entrance to the pier. They purpose, with the consent of the Harbour Commissioners, to widen Cliff-terrace at the entrance to the north pier by 26 ft. and tapering to 12 ft, providing a colonade beneath the new roadway, which will also serve as a shelter.

KENSINGTON HIGH-STREET.—After protracted negotiations active steps have been begun for the acquisition of house property on the north side of the street, which is to be widened to 60 ft. at an estimated net cost of about 66,500*l.*, and an outlay of 15,000*l.* for paving and other works. The property to be taken lies between the end of Church-street and Cumberland-place. The scheme includes the widening of Brown's-buildings. One-third of the cost of the improvement will be defrayed, jointly, by the Kensington and Westminster Borough Councils—the share of the latter being 5,000*l.*—and two-thirds by the London County Council.

BOLSOVER CHURCH.—It is stated that the Duke of Portland has promised to contribute 150*l.* towards payment of a debt in respect of the rebuilding of the church of St. Mary at Bolsover. The church, having been almost entirely consumed by fire on January 24, 1897, has been reconstructed, and upon an extended site, by Messrs. Bowman & Sons, of Stamford, as the general contractors, after Mr. Louis Ambler's plans and designs, at a total outlay of about 10,000*l.* For an increase of sitting room the south aisle has been extended laterally, thus rendering the two aisles of almost equal widths, whilst a widening of the nave has brought its axis into line with that between the thirteenth-century western tower (which escaped from the flames) and the fourteenth-century chancel. Weldon stone was used for the window tracery and similar work, Ancaster stone for the walls within, formerly plastered, and Bolsover Moor stone for the external walls.

THE SLATE TRADE.—Numerous reports have appeared in the daily papers as to the intended opening of a new quarry and employment of Penrhyn men by Mr. Assheton Smith. Names of men applying for work have been received at the Dinorwic Quarry office, but when a selection is made it is most probable it will not include Penrhyn men.

SANITARY INSPECTORS' ASSOCIATION. — The autumn Provincial Conference of the Association will be held this year at Middlesborough, on the invitation of the Mayor and Corporation. The meeting will be held on August 7, 8, and 9. The programmes are in course of preparation.

RUSSIAN FIRE CLAY TRADE. — The fire clay trade is rapidly rising in Russia. In the year 1898 about 60,000,000 poods were recorded, and the imports in the year 1900 were 11,414,000 poods, worth 2,162,000 roubles. The greater portion of the fireproof goods used in the Russian works is made on the premises where used.

PROPOSED ADDITIONS TO RUGBY SCHOOL.—It is proposed to considerably extend the accommodation at Rugby School. Old Rugbeians and others are being asked to subscribe to the fund, and already a sum of nearly 8,000*l.* has been given and promised. Almost immediately the authorities intend to proceed with the erection of a chemical laboratory near the racquet-courts, and the addition of three classrooms near the school chapel; and the larger scheme embraces the building of a new big school on what is at present the school house garden. Here there will be a natural history museum, classrooms, masters' rooms, and offices, and the principal entrance will be from the Barby-road, at a point opposite the gate leading to the Close.—*Birmingham Post.*

CARPENTRY AND JOINERY EXAMINATION.—At the examination held by the Carpenters Company at their Hall last week in these subjects the Board of Examiners included Professor T. Roger Smith, Mr. Jno. Slater, B.A., F.R.I.B.A.; The Master of the Company (Mr. John William); Mr. Chas. Hawksley, P.I.C.E.; Sir Philip Magnus; Mr. Bartlett, of King's College; the President of the Institute of Builders; the President of the Clerk of Works Association; and other gentlemen. The candidates, of whom there were a fair average number, came from Scotland and Wales as well as from the London district. The following is a list of the candidates arranged in order of merit:—*Silver Medals*—Messrs. H Barsby, A. Norton, and F. Turner; *bronze medal*—Mr. T. R. Barclay; *First Class Certificates*—Messrs. E. Tofield, A. Stewart, W. Wintersgill, and H. C. Armstrong; *Second Class Certificates*—Messrs. F. H. Sharp, G. G. Smith, Ivor John, E. Sudds, W. F. Grove, J. B. Davis, E. J. Davies, F. W. Blake, and E. M. Gauder.

CAPITAL AND LABOUR.

BRISTOL BUILDING TRADE DISPUTE. — The Board of Trade Labour Department has informed the Bristol Master Builders' Association that it has appointed Mr. A. A. Hudson, barrister, to act as conciliator in connexion with the matters in dispute between the Bristol Master Builders' Association and the various operative societies. A communication has been made from the officers of the Master Builders' Association to the effect that it would be convenient to have the matters in dispute settled prior to the Coronation festivities. The subject matter of the conciliation arises out of a notice given by the masters and the various societies for a reduction of wages and an alteration of rules. All the societies, with the exception of the masons and bricklayers, have consented to accept conciliation.—*Bristol Mercury.*

LEGAL.

THE FLEET-STREET LIGHT AND AIR CASE:

INJUNCTION GRANTED.

THE case of Henry Pooley & Son, Ltd., *v.* John Feeney & Co., came before Mr. Justice Joyce in the Chancery Division on the 10th, 11th, and 12th insts., an action by plaintiffs for an injunction to restrain defendants from interfering with or obstructing the ancient lights of No. 89, Fleet-street, E.C.

Mr. Hughes, K.C., and Mr. Ryland appeared for plaintiffs; and Mr. Younger, K.C., and Mr. Cozens Hardy for the defendants.

Mr. Hughes, in opening the case, said that plaintiffs were the lessees of No. 89, Fleet-street, being the well-known weighing-machine and scale manufacturers, and the defendants who owned the adjoining premises are the proprietors of the *Birmingham Daily Post.* The defendants' building was on the west side of the plaintiffs' premises, being No. 88, Fleet-street, and would be, when completed, used by them as their London offices. Between the two buildings was a well with certain windows looking into it. There were alterations in the plaintiffs' building in 1897, and the new windows were not as regards all of them in the same position as the old ones. The window on the ground floor was the same as the old one, and also the top window. But the others were not quite in the same position. The building had been in the occupation of the plaintiffs for fifty years. The old buildings on the site of No. 88, Fleet-street were pulled down a year or so ago, and the land remained vacant for some little time. Ultimately the defendants purchased the freehold, and were now erecting the London office of their journal on the site of the old buildings. The ground floor window of the plaintiffs' premises lighted a showroom, and the top window lighted a workshop. The intermediate windows lighted the staircase and lavatories. The increased height of the defendants' building would cause a very substantial diminution of light to the top window, and would injure the light as regarded all the windows. Defendants in their defence admitted that the top window of the plaintiffs was an ancient light, but they denied that the other windows were ancient lights. They also alleged that their building would not obstruct the access of light and air to the plaintiffs' building, or cause any real or substantial damage to the plaintiffs.

Mr. R. C. Murray, an architect and surveyor, said he had been advising architect to plaintiff in connexion with this matter. He had known the plaintiffs' building for over thirty years, acting for them when the old building was pulled down in connexion with the widening of Fleet-street. He produced the plans of the old building and the position of the windows, and also the plan of the new building of the plaintiffs. In the new building the top and bottom windows were practically uninterfered with. The top window of the plaintiffs' building was 10 ft. by 3 ft. When the old building on the site of No. 88, Fleet-street was up there was absolutely nothing to obstruct the light to the south and west except a chimney-stack. On the north side there was an obstruction about a foot higher in the shape of a slanting roof. If the defendants' building were completed as was intended by the plans, in his opinion the loss of light to plaintiffs' top room would be about 35 deg. The light of the room under the former building was a parallel light, now it would be a slanting light, not penetrating all over the room. An angle light in their top room would greatly affect its usefulness as a workroom. The light to the window on to the room on the third floor would be affected by the defendants' new building but not to such a serious extent. The actual effect of the defendants' new building to the plaintiffs was that each floor window was, as regarded light, one story lower in the well between the buildings than it was when the old buildings of the defendants' existed.

Cross-examined:

Defendants' building was now 13 ft. 6 in. distant in a horizontal line from the top room of plaintiff's building. In addition to the light to the room from the window opposite the defendants' building, there were windows at each end of the room and a skylight in the top. The room was about 40 ft. long by 18 ft. or 20 ft. wide. The room was a well-lighted room. In his opinion the white-glazed bricks in the walls opposite the windows on the first, second, and third floors would not give as good a diffused light as existed prior to the buildings being erected. Certain parts of the windows on the floors below the top window were formerly occupied by the windows in the old building.

Mr. Younger: Now could not a workman work conveniently in any part of this top room and have a good light for his work?

The Witness: All I can say is, that the light enjoyed by this window is damaged by the defendants' building.

Mr. Arthur John Gale, F.R.I.B.A., F.S.I., architect and surveyor to the Licensing Justices of the Newington Division, stated that he had inspected both buildings for the purposes of the action. With regard to the defendants' old building, he found that the roof came just above the sill of the plaintiffs' top window on the northern side. This caused a very slight obstruction of light. The new building of the defendants was much higher and standing in the centre of this room he was of opinion that it would be much darker and that the light would be materially affected. The light to the landings and staircases and also to the other floor windows was much diminished by the defendants' new building.

Mr. E. A. Eason, an architect and surveyor, of the firm of Messrs. Reynolds & Eason, gave corroborative evidence. He said that having seen the plans of the defendants' new building, he was of opinion that the sky area to the plaintiffs' workroom would be largely diminished.

Mr. Chaytor, Chairman of the plaintiff Company, examined by Mr. Hughes, said that the top room of their premises was not a lumber-room, as suggested, but a workroom. They had had as many as twenty people working in the room at once.

Cross-examined:

They had no one working in the room that day, but they would have one there the next morning. The Company's main works were not in London, but they did manufacture things at their Fleet-street premises.

In answer to his Lordship, Mr. Hughes stated that the plaintiffs' lease was dated March 31, 1898, the term to run from March 25, 1807 for twenty-one years. The rent was 300*l.* for the first year and 415*l.* per annum afterwards.

This being the plaintiffs' case,

Mr. Younger, on behalf of the defendants, said that before calling his witnesses he should like to point out to his Lordship that the defendants were the freeholders of their property. They purchased it as an open site from the Corporation of London and the conveyance was dated September 30, 1901

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and the price they paid for the open site was 15,500*l*. Both the plaintiffs' and the defendants' buildings were five stories high. His lordship would understand that they did not build bungalows in Fleet-street, as the land there was too valuable.

Mr. Chas. Reilly, F.R.I.B.A., examined by Mr. Younger, said he practised as an architect at No. 20, St. Swithin's-lane. He had had a large experience in light and air cases in the City of London and elsewhere. He had visited the plaintiffs' premises, and had also inspected the plans prepared by the defendants' architect, Mr. Belcher. He had looked at and compared the position and height of the old building formerly standing on the site of No. 89, Fleet-street, in relation to the windows in the plaintiffs' present building, and also with regard to the proposed new building of the defendants. He had been in the plaintiffs' showroom half an hour previously. He was of opinion that if the defendants' building was erected as proposed, it would not affect the access of light to the defendants' building as compared with the access of light to the old building. Neither the staircase window and the lavatory window on the next floor were affected to any material extent. There was a slight interference with the window on the second floor, but that interference would not render the staircase less convenient for use as a staircase. As to the staircase windows and two lavatory windows on the third floor, the diminution of the light by the defendants' building would be very small indeed. It would not affect the uses of the staircase at that point, seeing that the plaintiffs enjoyed an angle of light through the centre of the window of 50 deg. The witness stated that he had visited the plaintiffs' workshop that day and found that nobody was at work there. It had not the appearance of being a place in regular use. He was of opinion that the defendants' building would cause no material interference with the access of light to the west window of the workshop. He thought that the obstruction described by the plaintiffs' witnesses was "apparent but not real." He did not think there was any real obstruction. He considered that after the defendants' building was completed—if it was allowed to be built as proposed—the plaintiffs' top room would be a well-lighted room.

If the defendant's building be erected as proposed, will the selling or letting value of the plaintiff's house be affected, in your opinion?—Not in the least, I should think.

Can you indicate any kind of substantial injury to the plaintiffs by the erection of the defendants' building?—No.

Cross-examined by Mr. Hughes:

A workshop in that position in London was of considerable value, and a good light to it was of great importance.

What do you mean by the obstruction being apparent but not real?

The witness replied that he meant that if a person looked through a window and saw something which he did not see before, he might come to the conclusion that it would affect the light to the window, while it would not affect the angle of light at all.

The witness went on to state that the window in question enjoyed an angle of 67 deg. of light.

Do you doubt that the defendants' building will cause a serious diminution of light coming to that window?—I am sure it will not.

May I ask how high, in your opinion, the defendants might build without it becoming material?—I should say 5 ft. or 6 ft. more certainly.

If this were the only window to the workshop, and you were advising the owner on the matter, would you advise him to submit to this?—Yes.

Are you sure?—Quite sure.

His Lordship: That is from your experience as to how light and air cases are decided.

Further cross-examined, the witness stated that the defendants proposed building would cause no material diminution to the lower windows in the plaintiffs' premises.—It was not his view that if there were windows looking into a well, the depth of the well was immaterial.—Of course the deeper the well the less light penetrated to the bottom.

Mr. John Joass, an architect, also gave evidence supporting the defendants' case, that their proposed building would have no appreciable effect on the light to the plaintiffs' windows.

During the course of this witness's evidence, Mr. Hughes admitted that the cutting off of the sky area to the plaintiffs' building was so small as not to be worth troubling about.

Mr. John Belcher, examined by Mr. Younger, said he was an architect, practising at No. 20, Hanover-square. He was an Associate of the Royal Academy and Vice-President of the Royal Institute of British Architects, and had carried on his profession for thirty or forty years. He had had a large experience in the construction of buildings, and had acted as the defendants' architect in the present instance, and the building was being erected in accordance with plans prepared by him. He did not think that the defendants' new building, as compared with the old building which formerly stood on the site, would cause any appreciable damage to the access of light to the plaintiffs' workshop window. Such obstruction as there was was 13 ft. 6 in. or thereabouts from the window. He did not think that defendants' building would cause any substantial damage to the other windows of which plaintiffs complained. Defendants were under an obligation to the City Corporation to clear away the scaffolding before Coronation-day. Only a small piece of the defendants' building was concerned in this action. If the plaintiffs were successful in getting an injunction, it would necessitate, at least, the remodelling of the top story. It might possibly involve the removal of the top story.

Cross-examined by Mr. Hughes:

The diminution of light to the plaintiffs' workshop window by reason of the defendant's building was so small as not to be appreciable. It would not affect the workshop as a workshop.

In answer to a question by Mr. Hughes to the witness, Mr. Younger replied that the defendant's new building was 3 ft. higher on the north than the old building was.

Mr. E. A. Grüning also gave evidence in support of defendant's case. He said he had visited the premises in question and, although he had made no actual measurements himself, he had seen the plans of defendant's new building and of the old building which formerly stood on the site. The effect of the defendant's proposed new building would be to deprive the plaintiff's workshop window of a very low rate of light, but of nothing which was of any essential value in its use. The detendant's building would affect the plaintiff's windows on the third floor, but not to any material degree. There was no diminution of light coming direct from the sky area to the plaintiff's windows on the second floor. The defendant's building would practically have no effect at all on the plaintiff's windows on the ground and first floors.

Mr. Charles Augustus Lang, F.S.I., examined by Mr. Cozens Hardy, said he was a surveyor and a member of the firm of Jones, Lang, & Co. His firm had a very large experience of property in London. He had visited the plaintiffs' premises and had been in the workshop. He found that the windows there were extremely dirty and that one in which the glass had been broken had one-sixth part of it boarded over. The room did not appear to have been recently used. He had examined the plans of the proposed new buildings and the model of the old building. He thought from these that defendants' new building would have no effect whatever on the letting or selling value of the plaintiffs' premises.

His Lordship: Will it increase it?

The witness: No, nor diminish it.

Learned counsel having addressed his lordship on behalf of their respective clients,

His Lordship, in giving judgment, said he had to perform the duties of a jury and determine whether what the defendants were doing would in any way diminish the light coming to the plaintiff's buildings. Bearing in mind the admissions of the defendants' witnesses and the obstruction that was evident, he had come to the conclusion that the obstruction was so material as to entitle the plaintiffs to an injunction. The obstruction caused by the defendants' building being erected as proposed, would render the plaintiffs' workshop less comfortable and enjoyable than before and less available for the purposes of business. He considered that the plaintiffs were entitled to an injunction in the Yates & Jack form, with costs.

Mr. Younger applied for a stay of execution pending appeal.

His Lordship refused the stay, but said that Mr. Younger could go to the Court of Appeal, without leave.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

3,110.—IMPROVEMENTS IN LIFT VALVES: *W. J. Nicholls and H. C. Gill.*—The casing of a water tap or cock is made of two parts that are screwed to one another, and fitted on to the supply-pipe. For obviating leakage the inventors fashion the disc of the valve and the valve-seating in the shape of a cone, and cause the screwed spindle to work in a long tapped sleeve. The spindle is longer than is customary, and the valve can be set so as to work in a reversed direction.

3,128.—BLOW-LAMP FOR PLUMBERS, PAINTERS, AND ZINC-WORKERS: *J. Adams* (*Burridge & Co.*).—The reservoir from which the spirit is supplied, instead of from a detached vessel, is formed with its top and sides in one piece. An opening in the top leads to a screw-plug valve, of which the outlet is turned against the junction of the feed and burner tubes, as well as towards a well in the crown of the reservoir. When the reservoir has been heated the valve becomes opened, and the spirit flows into the well. Thereupon the valve becomes shut, and the burner-valve opens, so that the ignition of the spirit in the well lights the lamp.

3,186.—TESTING OF DRAINS: *W. H. Tucker and R. White.*—A bulb, in which is sealed up some strongly smelling material, is put into a cardboard box covered with tissue paper, when the box and bulb are floated in the drain, a string attached to the bulb is pulled so as to break the bulb and liberate its contents.

3,266.—CONSTRUCTION OF KILNS AND FURNACES: *J. H. Brearley.*—For the air-heating conduits are devised vertical tubes which are arranged so as to traverse the horizontal waste-gas flues, the air-inlets may be disposed so as to be common to all the tubes along one side, or each tube may have its own air-inlet.

3,272.—SPIGOT-AND-SOCKET JOINTS: *G.T. Ashton.*—In the case of soil, rain-water and similar pipes, the pipe lengths are fashioned with a flanged half-socket at their one end, after the spigot of the adjoining length has been put into position, a separated half-socket is bolted on to lugs of the flange for completion of the joint. The contrivance enables one to replace any length without disturbing other lengths.

3,282.—MANUFACTURE OF CEMENTS: *G. Möller and P. Pfeiffer.*—Small-sized blocks of dried slurry are mingled with fresh slurry, and again dried, the process is repeated until the balls or blocks become big enough. Then the dried slurry is fed into the drying apparatus together with a further supply, and the larger blocks are separated with a screen or sieve, or further supplies may be poured upon the slurry as it is being dried upon some flat surface by currents of hot air, or otherwise. Various modifications of the process are specified.

3,200.—A FASTENING, WITH AN INDICATOR, FOR DOORS, &c.: *C. J. Harcourt.*—A slotted casing is affixed to the door, the slot reveals an indicating disc carried by a squared spindle within a sleeve or bush fitted against a disc that works in a rebate of the casing. To the spindle, which is inserted into a hole in the door, is secured one end of a spring, of which the other end is affixed to the casing—the spring forces the indicating disc against the casing. Inside the door is a latch, to which is fastened a squared spindle of the sleeve, and the latch is held in its place by a stopped plate interposed between it and a washer on the spindle. For fastening the door, one turns the latch down to engage with a socket upon the door frame, where it will be held with a hinged lever or gravity catch, the indicator will thereupon register "engaged," but "vacant" will appear in the slot upon the lifting of the catch, which causes the latch to return to its idle position through the action of the spring. Another form is available for a door with a projecting frame, the catch being attached to the door, and having an extension-piece to be worked by pressure.

3,304.—A LOAD-SUSTAINER FOR HOISTS: *F. Krupp.*—For an automatical load-sustainer there are sliding friction discs keyed on to a crank-shaft which by means of nut-adjusted springs will grip a ring that freely turns in the direction for lifting the load, but which a ratchet, or an eccentrical friction pawl prevents from turning in the opposed direction. For lowering the load, a crank is moved to overcome the friction engendered between the ring and the sliding discs. To save space, the nut which adjusts the springs serves as a journal of the crank-shaft.

3,348.—DOOR KNOBS AND THEIR ATTACHMENTS: *G.W. Pridmore.*—A ridge that forms one side of, it may be, a steel-lined groove, on the neck of the knob takes an annular projection upon the rose. When that adjustment has been effected, the groove is completed by bending the end of the neck out-outwards. In a variant form, a recess around a plug screwed into the neck of the knob registers with a recess on the groove, and thereby supplies a groove for the projection from the rose, which may itself constitute the grooved member, the neck having a projection accordingly. The spindle, which should be so long that its ends will reach to the inside surfaces of the knob-heads, is taken by angular holes cut in the plug and in the neck of the knob.

3,351.—FLUSHING APPARATUS: *J. Shanks.*—In order to obviate premature action in the case of basins provided with a siphonical discharge a branched pipe from the flushing pipe is passed at one outlet into the siphon-bend and at the other outlet into the ventilating pipe or to the open air, so that air will enter and arrest the action in the event of the siphon starting when a flush is not taking place. For an intermittent and automatical starting contrivance an auxiliary tubular trapped siphon is mounted between the sealing-cup and the crown of the principal siphon, and communicates, through an opening, with the seal; with the rise of water in the cistern the compressed air in the cistern blows the seal out of the little siphon and thereby allows the air to escape for starting the main siphon.—Confer also No. 19,177 of 1896 for other means of starting the siphon.

3,352.—FITTINGS FOR LAVATORY BASINS AND BATHS: *J. Shanks.*—The frame of the basin consists of tubes suitably jointed together through which hot water is caused to circulate for warming the room or for drying towels. A similar arrangement is available for use with baths.

3,382.—FACING-TILES: *E. Holwill.*—The backs of the tiles have undercut recesses for taking cement, whilst recesses in their edges take plugs or keys and pointing or jointing cement. The use of nails, screws, and staples, or of wires to be hidden in the joints, is provided for by making recesses in the edges of the tiles or fashioning them with lugs. The tile-mould consists of two portions that fit into a frame or box and have their sliding surfaces curved.

3,412.—APPLIANCES FOR FANLIGHTS, VENTILATORS, DOORS, SWING-WINDOWS, &C.: *R. Adams.*—For opening, closing, fastening, and regulating

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purposes is devised a bell-crank lever whereof the longer arm joins a slot in a fanlight window-frame, and the shorter arm is joined to a vertical rod that moves the window and is joined to a crank on the shaft, on which are, it may be, other cranks for working other windows at the same time. A spring-bolt set in engagement with a toothed segment will secure in any desired position a lever which works the vertical rod, and is itself worked with a cord at its shorter end as applied to a window which is hinged at the top. Confer also Nos. 16,817 of 1884, 6,614 of 1895, and 4,389 of 1899.

3,428.—TOPS FOR CHIMNEYS AND VENTILATING-SHAFTS: *F. Procter.*—Hinged flaps, which a light current of air inwards will close, cover openings in the sides of the chimney or shaft top, but will, under normal conditions, hang in an opened position; the flaps may be joined together in pairs with rods, and may be provided with cheeks at their sides—the openings in the tops also may be fitted with hoods.

3,444-5.—MECHANISM FOR THE GATES OF LIFT-WELLS AND FOR LOCKING LIFT-CAGES: *A. Manke.*—The vertical guides on which the gate slides are set at an incline from the well towards the top, the shorter end of a pivoted and weighted lever projects into the well in order that it may impinge against the ascending cage and so raise the gate; with the continued ascent of the cage that end of the lever becomes disengaged by reason of the inclination of the guides, and the gate thereupon falls; with the fall of the gate the lever strikes against a catch, which impels it to engage with a pawl so as to draw the short arm out of the well; a pin pressing against a lever lifts a wheel-block when the gate is shut. (3,445) The cage is locked when it arrives at a floor by means of a bolt that is driven into a socket on the cage by a lever after an arm has struck the inner end of a pivoted lever, whereof the other end, acting through a pin, locks the bolt, at the same time the first-named lever removes a block from the rails.

3,538.—SIPHONAGE AND WATER SUPPLY (DOMESTIC): *R. T. Napier.*—The inventor's object is to prevent the noise that commonly ensues when the siphonage is broken. He links the starting-valve to a pivoted rocking lever, at one end of which is a perforated bucket. As the lever is lifted for starting the flush a weight causes it to resume its normal position for closing the valve. With a fall of the water level the weight is overbalanced by the partly-charged bucket, and air thereby enters to break siphonage as the valve is again raised. The noise of the in-flowing water is deadened by putting the supply cock at the bottom of the tank. The lever of the cock is linked to the float-arm.

3,539.—IMPROVEMENTS IN WINDOW SASHES AND STILES: *F. Fryer and P. McKeggie.*—Rebated sash stiles, having segmental projections that work in recesses cut in the sliding stiles, are pivoted on to rebated sliding stiles; if the sash is turned into a horizontal or diagonal position its projections will press against stop-surfaces of the sliding stiles; in another adaptation the pivots are discarded for curved blocks of the sash that slide over segmental ribs of the sliding stiles; in a variant form the face of the sliding stile is pressed when the sash has been turned downwards by a block on the sash stile which enters into a recess in the sliding stile.

3,552.—FITTINGS FOR LIFTS: *A. Tomkins.*—Two irons, having a channel-section, constitute a guide for the cage, which has an upper pair of wheels that run upon the inner surface, whilst a lower pair of wheels run upon the outer surface, of the flange; the two sets of wheels may be so arranged as to run in the channels of the guides.

3,576.—A SWITCH FOR ARC LAMPS, &C.: *P. H. F. Spies and F. Norden.*—To enable one to readily examine the lamp in its place, and to provide for series lighting together with the separation of the contacts, but with closure of the main circuit, contact-rings are mounted upon a socket which is fitted on to a bracket secured to the pulley-frame. Two of the contact-rings, which should be two interlocking helical springs, and having an oval cross-section, are connected to one terminal and the third ring to the other terminal. A sliding ring closes the circuit. Two rings are fitted upon a plug having a hook that carries the lamp, and their engagement with two of the contact-rings completes the lamp-circuit when the sliding ring is forced back as the rope pulls upon the rings. In another shape a plug replaces the socket, and the movable pieces have a socket.

3,620.—A PAVEMENT FOR TRAMWAYS: *H. Melsom.*—Between the ordinary road paving and the tram rails are laid tapered paving-blocks and other blocks shaped to fit with the rails. Each block and rail is partly enveloped with bituminous cloth for making an elastic and watertight joint, melted bitumen being used as an adhesive material for fixing the cloth.

3,629.—A LIFTING JACK: *E. R. Farnsworth.*—A nut, constituted as either a bevel-wheel or a worm-wheel, is mounted upon ball-bearings placed between it and the stand, and is to be engaged by a screw that is mounted centrically in the stand. The nut is rotated by a short crank shaft which carries a pinion or a worm. A projecting foot and a loose top are fitted on to the middle screw.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

June 4.—By OSBORN & MERCER (at Petersfield).

Buriton, &c., Hants.—Buckmoor Farm, 53 a. 3 r. 31 p., f., y.r. 75*l.* £5,550

Steep, Hants.—Dunhill Farm, 64 a. 1 r. 36 p., f. and c., y.r. 128*l.* 5,000

Petersfield, Hants.—The Rushes-rd., a plot of building land, f. 340

June 5.—By THOMPSON, WHITTON, & LAING (at Sidmouth).

Branscombe, Devon.—Edge Barton Farm, 309 a. 3 r. 26 p., f., y.r. 290*l.* 5,000

June 6.—By LANGRIDGE & FREEMAN (at Tunbridge Wells).

Mayfield, Sussex. — Holmstall, Stone Lodge, Dapsland, Ordnance Place, Reedings, Freemans, and Horleigh Green Farms, with several enclosures, 332 a., f. (in one lot) 10,000

By WHITTINDALE & WATSON (at Coventry).

Stretton-on-Dunsmore, Warwick. — Bull and Butcher Farm, 73 a. 3 r. 24 p., f. 1,425

Heath Closes, 12 a. 3 r. 16 p., f. 470

Fillongley, Warwick.—Packsaddle Hall and 15 a. 0 r. 6 p., f., y.r. 31*l.* 10s. 1,120

Easenhall, Warwick.—Five enclosures of land, 28 a. 1 r. 34 p., f. 820

June 7.—By COOPER & WACHER (at Canterbury).

Patrixbourne, Kent.—The Higham Estate, with the Home Farm, 183 a. 3 r. 24 p., f. 7,000

By Messrs. SPELMAN (at Norwich).

Haddiscoe, Norfolk.—A freehold and copyhold farm, 69 a. 0 r. 4 p. 925

The Crossways Field, 7 a. 2 r. 14 p., f. 110

Loddon, Norfolk.—Four grazing marshes, 33 a. 3 r. 23 p., f. 1,000

West Bradenham, &c., Norfolk.—A freehold and copyhold farm, 75 a. 0 r. 9 p. 750

June 9.—By FRITH, GARLAND, & Co.

Finsbury Park.—329, Green-lanes (s.), u.t. 75 yrs., g.r. 12*l.*, e.r. 80*l.*, with goodwill 825

Harringay.—120, Effingham-rd., u.t. 88 yrs., g.r. 5*l.*, e.r. 32*l.* 260

Wood Green.—26, Victoria-rd., u.t. 95 yrs., g.r. 6*l.* 10s., e.r. 36*l.* 325

45, Willingdon-rd., u.t. 99 yrs., g.r. 6*l.*, e.r. 30*l.* 300

Islington.—61, 63, and 65, Prebend-st., u.t. 24 yrs., g.r. 18*l.* 18s., y.r. 550

June 9.—By FRANKLIN, GALE, & NEWTON.

Hampstead Norris, Berks.—The Manor Farm Estate, 779 a. 3 r. 27 p., f. 8,000

Benson, Oxon.—Moorland's Allotment, 18 a. 1 r. 7 p., f. 500

By HENRY LANGSTON & Co.

Peckham.—11, 13, 15, and 17, Stanton-st., f., w.r. 53*l.* 6s. 1,175

Walworth.—3, Northampton-pl., f., w.r. 36*l.* 8s. 285

18 and 20, Alvey-st., f., w.r. 57*l.* 4s. 635

8 and 10, Aylesbury-st., f., w.r. 52*l.* 700

Peckham.—19 and 21, Stanton-st., u.t. 42 yrs., g.r. 5*l.*, w.r. 52*l.* 400

18 to 26 (even), Stanton-st., u.t. 72 yrs., g.r. 16*l.* 5s., w.r. 130*l.* 1,110

5 to 8, Winchester-pl., u.t. 44 yrs., g.r. 12*l.*, w.r. 55*l.* 8s. 405

By KING & CHASEMORE.

Nuthurst, Sussex.—Marelands Farm, 86 a. 0 r. 19 p., f. 1,960

Cowfold, &c., Sussex.—King's Farm, 149 a. 2 r. 23 p., f. 1,685

Redfield's Enclosures, 12 a. 1 r. 13 p., f. 420

By LINNETT & LANE.

Westbourne Park.—93, Southam-st., u.t. 63 yrs., g.r. 8*l.*, w.r. 55*l.* 18s. 310

58 and 60, Cirencester-st., u.t. 50 yrs., g.r. 10*l.*, w.r. 132*l.* 12s. 600

Harlesden.—64, Harlesden-gdns., u.t. 92 yrs., g.r. 6*l.*, y.r. 36*l.* 350

By P. M. PUCKRIDGE.

Bedwyn, Wilts.—The Little Bedwyn Estate, 801 a. 1 r. 11 p., f. 7,500

By ALFRED RICHARDS.

Palmer's Green.—Alderman's Hill, &c., The Old Park, freehold building estate, 130 a. 2 r. 11 p. 45,000

Green Lanes, The Fox p.-h., f., y.r. 70*l.* 11,020

Green Lanes, a block of building land, 8 a. 3 r. 19 p., f. 10,150

Green Lanes, &c., a corner block of building land, area 3,600 yds., f. 2,200

Green Lanes, a piece of freehold land, 1 a. 3 r. 5 p. 555

Alderman's Hill, a block of building land, 5 a. 0 r. 31 p., f. 4,050

Hopper's-rd., a piece of building land, 2 a. 2 r. 0 p., f. 2,100

New Southgate.—East Barnet-rd., The Waterfall Estate, 24 a. 2 r. 11 p., f. 5,500

By A. SAVILL & SONS.

Corringham, &c., Essex.—Oilmill Farm (with part of Reedham Farm), 104 a. 0 r., 13 p., f., p. 2,000

Corringham, Essex.—Reedham Farm, 126 a. 2 r. 10 p., f., p. 2,500

June 10.—By ELLIS & PALMER.

East Grinstead, Sussex.—The Brockhurst Pk. Estate, 204 a. 1 r. 6 p., f. 12,000

By DAVID BURNETT & Co.

Rotherhithe. — Southwark Park-rd., Southwark Park Tavern, f.g.r. 25*l.*, reversion in 43 yrs. 1,100

Bermondsey.—43, The Grange (S), f., w.r. 39*l.* 400

5 to 13 (odd), Stanworth-st., f., w.r. 156*l.* 1,450

Rotherhithe.—8 to 12, Glebe-rd., u.t. 43 yrs., g.r. 4*l.* 15s., w.r. 106*l.* 12s. 730

17 to 22, Matson-st., u.t. 43 yrs., g.r. 5*l.*, w.r. 176*l.* 16s. 1,250

By CHINNOCK, GALSWORTHY, & CHINNOCK.

Covent Garden.—26 to 32 (even), Neal-st., and 8 to 12, Nottingham-court, area 5,140 ft., f., e.r. 280*l.* 16s. 5,710

By DEBENHAM, TEWSON, & Co.

East Barnet, Herts.—Colney Hatch-rd., freehold building land, area 12 a. 2 r. 15 p. 2,700

Capel-rd., f.g.r. 8*l.* 10s., reversion in 93 yrs. 210

By KNIGHT, FRANK, & RUTLEY.

Clapton.—83, Rushmore-rd., u.t. 66 yrs., g.r. 5*l.*, q.r. 36*l.* 8s. 370

By NOTT, CARTWRIGHT, & ETCHES.

Fulham.—48, Hartopp-av., u.t. 68 yrs., g.r. 5*l.*, y.r. 39*l.* £400

Balham.—50 and 52, Sistova-rd., u.t. 75 yrs., g.r. 14*l.* 14s., y.r. 68*l.* 610

Mitcham, Surrey.—Graham-rd., Ivydene, f., e.r. 26*l.* 310

By ALFRED RICHARDS.

Tottenham.—High-rd., The Ferns, area 2,670 yds., f., p. 1,370

High-rd., a block of freehold land, area 3,100 yds. 810

Broad-lane, a block of freehold building land .. 37, Lansdowne-rd., f., p. 220

Enfield.—Forty Hill, The Goat p.-h., f., y.r. 60*l.* 1,160

By ROGERS, CHAPMAN, & THOMAS.

South Kensington. — 41, Prince's-gdns., u.t. 42 yrs., g.r., &c., 82*l.* 10s., p. 5,995

65, Redcliffe-rd., u.t. 63 yrs., g.r. 10*l.* 10s., y.r. 55*l.* 5,000

Pimlico.—Vauxhall Bridge-rd., f.g.r. 7*l.* 10s., reversion in 37 yrs. 440

235, Vauxhall Bridge-rd., f., y.r. 65*l.* 335

281, Vauxhall Bridge-rd., u.t. 22 yrs., g.r. 10*l.*, p. 1,050

Epsom, Surrey.—College-rd., Quinta and Lyndhurst, u.t. 85 yrs., g.r. 19*l.*, y.r. 110*l.* 740

Croydon.—6, 7, and 8, St. Saviour's-rd., u.t. 60½ yrs., g.r. 19*l.* 10s., y.r. 77*l.* 835

By S. & G. KINGSTON (at Spalding).

Whaplode St. Catherine's, Lincs.—Four enclosures of pasture, 19 a. 3r. 25 p., f. 945

Four enclosures of arable, 36 a. 1 r. 35 p., f. 1,295

June 10.—By J. C. PLATT (at Hammersmith).

Hammersmith. — Wingate-rd., The Maisonette and 1 a., u.t. 41 yrs., g.r. 17*l.* 10s., e.r. 50*l.* 775

Gunnersbury. — 19, Whitehall Park-rd., u.t. 89½ yrs., g.r. 6*l.* 10s., e.r. 35*l.* 335

By WRIGHT & SCRUBY (at Saffron Walden).

Hadstock, Essex.—Davey's Farm, 68 a. 1 r. 18 p., f. 850

The Hill Farm, 43 a. 0 r. 27 p., f. 445

Various enclosures, 57 a. 3 r. 28 p., f. 910

By FLEURET, SONS, & ADAMS (at Masons' Hall Tavern).

St. Leonards-on-Sea, Sussex.—Western-rd., the Royal Hotel, f., p. 9,000

Newbury, Berks.—London-rd., the Cross Keys p.-h., and residence adjoining, f., p. 2,480

By GARROD, TURNER, & SON (at Ipswich).

Ipswich.—The Chantry Estate, about 490 a., f. (in numerous lots) 17,190

June 11.—By BAXTER, PAYNE, & LEPPER.

Swanley, Kent.—The Orchard (residence) and 3 a. 2 r., f., p. 1,075

Bromley, Kent.—Highland-rd., Red Bank, f., p. .. 1,500

Highland-rd., Lola Villa, f., y.r. 9*l.* 1,275

By W. R. NICHOLAS & Co.

Coleshill, Bucks.—Red Barn Farm, 133 a. 2 r. 9 p., f., p. 4,700

By RUSHWORTH & STEVENS.

Holloway.—115, St. John's-rd., u.t. 74¾ yrs., g.r. 7*l.*, y.r. 37*l.* 430

117, St. John's-rd., u.t. 74¾ yrs., g.r. 7*l.*, p. ... 450

Notting Hill.—Pembridge-rd., f.g.r. 13*l.*, reversion in 50 yrs. 400

Lambeth.—Lambeth-walk, f.g.r. 7*l.* 10s., reversion in 7½ yrs. 830

Wood-st., f.g.r. 4*l.* 14s., reversion in 7½ yrs. 1,100

By SMITH, SON, & OAKLEY.

Forest-row, Sussex.—The Priory Estate, 58 a. 0 r. 35 p., f. 10,500

Various enclosures of land, 43 a. 2 r. 38 p., f. .. 5,000

By SADLER & BAKER.

Frimley, Surrey.—Highbridge Building Estate, 108 a., f. 6,000

By WALTON & LEE.

Bray, Berks.—South Upper and North Upper Meadows, 7 a. 0 r. 12 p., f., y.r. 6*l.* 200

By DOUGLAS YOUNG & Co.

Clapham.—Clarence-rd., Melville House, f., e.r. 100*l.* 1,000

Finsbury.—100, 102, and 104, Clifton-st., f., y.r. 120*l.* 2,940

Islington.—1, 2, and 3, Noel-st., f., y.r. 176*l.* 14s. 2,440

Hackney.—1, 3, and 5, Eleanor-rd., u.t. 43 yrs., g.r. nil, y.r. 106*l.* 1,320

By EDWIN STOOKE (at Hereford).

Kingsland, Hereford.—A freehold estate, 169 a. 0 r. 27 p. 7,995

By T. WOODS (at Hounslow).

Hounslow, Middlesex.—1, 2, and 3, Ivy Cottages, and 1 to 4, Frances' Cottages, f., y.r. 103*l.* 8s. 1,385

121, 125, and 127, High-st. (S), f., y.r. 120*l.* 1,460

1 to 4, Dove's Cottages, f., w.r. 98*l.* 16s. 1,015

Bulstrode-rd., two plots of land, f. 160

Wellington-rd. North, London House, with shop, slaughterhouse, &c., f., e.r. 40*l.* 600

Heston, Middx.—1 to 4, Cook's Cottages, f., w.r. 39*l.* 13s. 410

Reversion (half share) to 3, Chapel-rd., Hounslow, f. 100

By BRUTON, KNOWLES & Co. (at Tewkesbury).

outhwick, Glos.—Stone House Farm, 110 a. 1 r. 34 p., f 4,500

Elmstone, Hardwick, Glos.—Two enclosures, 19 a. 2 r. 23 p., f. 875

Two freehold cottages and 0 a. 0 r. 37 p. 120

By NEWLAND, DAVIS, & HUNT (at Newport).

Langstone, &c., Monmouth. — The Langstone Court Estate, about 1,020 a., f. and c. (in numerous lots) 47,350

By GEO. WIGLEY (at Newport Pagnell).

Cranfield, Beds.—Wharley Farm, 171 a. 2 r. 19 p., f. 2,800

ALFRED & DEARMAN EDWARDS (at Hereford).

Burghill, &c., Hereford.—The Hermitage Estate, 135 a. 2 r. 31 p., f. 3,900

By W. H. SHINER & WINTER (at Yatton).

Winscombe, Somerset.—A freehold farm, 29 a. 2 r. 36 p. 1,500

Numerous enclosures of land, 148 a. 3 r. 1 p., f. 5,589

June 12.—By ARTHUR BARTON.

Lee. — 154, Burnt Ash-hill, u.t. 62½ yrs., g.r. 12*l.* 12s., y.r. 78*l.* 770

130, Burnt Ash-hill, u.t. 62½ yrs., g.r. 9*l.* 9s., q.r. 50*l.* 380

35, Baring-rd., u.t. 62½ yrs., g.r. 7*l.* 10s., e.r. 35*l.* 275

By BELLHAM, WILLIAMS, & Co.

Wimbledon.—88 and 90, Faraday-rd., f., w.r. 65*l.* 685

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168 and 170, South Park-rd., u.t. 96, g.r. 12*l.*, e.r. 60*l.* £588
1, 2, and 3, Sunny-villas, u.t. 97½ yrs., g.r. 13*l.* 10s., w.r. 74*l.* 2s. 475

By H. J. BLISS & SONS.

Bethnal Green.—41 to 55 (odd), Hereford-st., f., w.r. 156*l.* 1,730
60, Abbey-st., and 10, Hereford-st., with factory in rear, f., y.r. 89*l.* 10s. 1,380
64 and 66, Abbey-st., f., y.r. 104*l.* 1,020
26 to 30, Morpeth-rd., u.t. 26½ yrs., g.r. 17*l.*, w.r. 139*l.* 14s. 585
Stratford.—46 to 52 (even), Keogh-rd., f., w.r. 93*l.* 12s. 750
37 to 47 (odd), Louise-rd., u.t. 76 yrs., g.r. 16*l.* 10s., w.r. 140*l.* 8s. 920
70, 72, 84, 86, 88, and 90, Leyton-rd., u.t. 14½ yrs., 13*l.* 15s., y.r. 138*l.* 14s. 500
73 to 87, Chichester-rd., u.t. 82 yrs., g.r. 45*l.*, w.r. 370*l.* 10s. 3,010
Bethnal Green. — Winbolt-st., &c., i.g.r.'s 123*l.* 18s., u.t. 20 and 23 yrs., g.r. 14*l.*, with reversions 1,280

By BRIANT & SON.

Clapton.—31, Glenarm-rd.. u.t. 65½ yrs., g.r. 6*l.* 10s., y.r. 32*l.* 360
Bexley Heath, Kent.—6, Market-pl. (S), f., y.r. 32*l.* 500

By DEBENHAM, TEWSON, & Co.

Forest Hill.—16, Honor Oak-rd., area ¾ a., f., p. . 1,500

By C. C. & T. MOORE.

Canning Town.—2 to 16 (even), 31 to 45 (odd), Evelyn-rd., u.t. 76½ yrs., g.r. 58*l.*, w.r. 318*l.* 10s. 1,400
Poplar.—27 to 37, 47 to 57 (odd), Southill-st., u.t. 51 yrs., g.r. 12*l.*, w.r. 214*l.* 12s. 2,670

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; w.r. for weekly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard.

MEETINGS.

MONDAY, JUNE 23.

Royal Institute of British Architects.—Ordinary meeting: Presentation of gold medal. 8 p.m.

WEDNESDAY, JUNE 25.

Builders' Foremen and Clerks of Works' Institution.—Half-yearly meeting of Directors. 8 p.m.

SATURDAY, JUNE 28.

Edinburgh Architectural Association.—Excursion to Carlisle and Lanercost.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c

	£ s. d.	
Hard Stocks	1 11 0	per 1,000 alongside, in river
Rough Stocks and Grizzles	1 9 0	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 5 0	,, ,, ,,
Flettons	1 8 0	,, at railway depôt
Red Wire Cuts ..	1 12 0	,, ,, ,,
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,, ,, ,,
Do., Bullnose	4 11 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 6 0	,, ,, ,,
GLAZED BRICKS		
Best White and Ivory Glazed Stretchers.....	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers..	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers..	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	14 0 0	,, ,, ,,
Seconds Quality White and Dipped Salt Glazed....	2 0 0	less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	31 0	per ton, delivered.
Best Ground Blue Lias Lime..	25 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 10s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

PRICES CURRENT (*Continued*).

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depot
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 3	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks ..	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	s. d. 2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt
,, ,, ,, 6 in. sawn both sides landings	2	7 per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	12 0 0	per 1000 of 1200 at rly. dep
,, best seconds ,,	11 10 0	,, ,,
16×8 best ,,	6 17 6	,, ,,
20×10 best blue Portmadoc ..	11 7 6	,, ,,
16×8 best blue Portmadoc	6 5 0	,, ,,
20×10 best Eureka unfading green....	13 10 0	,, ,,
16×8 ,, ,,	7 10 0	,, ,,
20×10 permanent green	10 10 0	,, ,,
16×8 ,, ,,	6 0 0	,, ,,

TILES.

	s. d.	
Best plain red roofing tiles..	41 6	per 1,000, at rly. depôt.
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	48 6	per 1,000 ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	14 10 0	16 0 0	
Deals: best 3 by 9.....	13 10 0	15 0 0	
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	10 10 0	11 10 0	
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.	
Deals: seconds	1 0 0	less than best	
Battens: seconds	0 10 0	,, ,, ,,	
2 in. by 4 in. and 2 in. by 6 in. ..	8 10 0	9 10 0	
2 in. by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0 0	
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.	
¾ in.	1 0 0	,,	
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Swedish balks.....	2 15 0	3 0 0	
itch-pine timber (30 ft.).....	3 0 0	3 10 0	

JOINERS' WOOD.

	At per standard.		
Whi Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0	
3 in. by 9 in.	20 0 0	21 0 0	
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0	
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0	
,, ,, 3 in. by 9 in.	16 10 0	18 10 0	
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0	
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0	
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0	
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0	
Do. 3 in. by 9 in.	17 0 0	18 0 0	
Battens.....	13 0 0	14 0 0	
Second yellow deals, 3 in. by 11 in.....	15 0 0	16 10 0	
Do. 3 in. by 9 in.	13 10 0	14 10 0	
Battens.....	11 0 0	12 0 0	
Third yellow deals, 3 in. by 11 in.....	12 10 0	13 10 0	
Do. 3 in. by 9 in.	12 0 0	13 0 0	
Battens.....	10 0 0	11 0 0	
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 0 0	15 0 0	
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0	
Battens.....	11 0 0	12 0 0	
Second white deals 3 in. by 11 in.	13 0 0	14 0 0	
,, ,, ,, 3 in. by 9 in.	12 0 0	13 0 0	
,, ,, ,, battens.....	9 10 0	10 10 0	
Pitch-pine: deals	16 0 0	18 0 0	
Under 2 in. thick extra	0 10 1	0 0 0	
Yellow Pine—First, regular sizes..	32 0 0	33 10 0	
Broads (12 in. and up).....	2 0 0	more.	
Oddments	22 0 0	24 0 0	
Seconds, regular sizes	24 10 0	26 10 0	
Yellow Pine Oddments	20 0 0	22 0 0	
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6	
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0	
Small ,, ,, ...	0 2 3	0 2 6	
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6	

PRICES CURRENT (*Continued*).

WOOD.

	At per standard. £ s. d.	£ s. d.
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
¾ in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube.....	0 3 0	0 3 6
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6

6 in. at 6d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans £ s. d.	per ton. £ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

METALS.

	Per ton, in London £ s. d.	£ s. d.
IRON—		
Common Bars.....	7 15 0	8 5 0
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars.....	9 0 0	9 10 0
Hoop Iron, basis price.....	9 5 0	9 10 0
,, ,, galvanised.....	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.....	10 0 0	- - -
,, ,, to 24 g.....	12 0 0	- - -
,, ,, to 26 g.....	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.....	14 5 0	- - -
Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g.....	16 0 0	- - -
,, ,, 22 g. and 24 g.	16 10 0	- - -
,, ,, 26 g.....	18 0 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12 0 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 5 0	9 15 0

(Under 3 in. usual trade extras.)

LEAD, &c.

	Per ton in London £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 0 0	- - -
Pipe in coils	14 10 0	- - -
Soil Pipe.....	17 0 0	- - -
ZINC—Sheet—		
Vieille Montagne..... ton	24 0 0	- - -
Silesian	23 15 0	- - -
COPPER—		
Strong Sheet..... per lb	0 0 10	- - -
Thin ..... ,,	0 0 11	- - -
Copper nails..... ,,	0 0 11	- - -
BRASS—		
Strong Sheet..... ,,	0 0 10	- - -
Thin ,, ... ,,	0 0 10½	- - -
TIN—English Ingots..... ,,	0 1 5	- - -
SOLDER—Plumbers' ..... ,,	0 0 7	- - -
Tinmen's ..... ,,	0 0 0	- - -
Blowpipe ..... ,,	0 0 10½	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2d. ,, ,,
21 oz. thirds	3½d. ,, ,,
,, fourths.....	3d. ,, ,,
26 oz. thirds	4½d. ,, ,,
,, fourths	3½d. ,, ,,
32 oz. thirds	5½d. ,, ,,
,, fourths	4½d. ,, ,,
Fluted sheet, 15 oz.....	3d. ,, ,,
,, 21 ,, ...	4d. ,, ,,
¼ Hartley's Rolled Plate	1½d. ,, ,,
⅜ ,, ,, ,, ...	2½d. ,, ,,
½ ,, ,, ,, ...	2½d. ,, ,,

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels ..	per gallon	0 2 11
,, ,, ,, in drums	,,	0 3 2
Boiled ,, ,, in pipes or barrels ..	,,	0 3 1
,, ,, ,, in drums	,,	0 3 4
Turpentine, in barrels	,,	0 2 11
,, in drums	,,	0 3 1
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	,,	20 0 0
Best Linseed Oil Putty	per cwt.	0 8 6
Stockholm Tar	per barrel	1 12 0

[*See also page 627.*

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums	Designs to be delivered
*New School, Holland-road, Great Clacton	Great Clacton School Board	Not stated	July 26
*Southend (Eastern) Church Extension	The Committee	Not stated	Sep. 7

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Supply of Fencing Materials	East Ham U.D.C.	Council's Engineer, Public Offices, East Ham	June 23
Paving Princes-street and other Streets	Tynemouth Corporation	J. F. Smillie, Borough Surveyor, Tynemouth	June 24
Sewers, &c.	Ashby-de-la-Zouch U.D.C.	J. B. Everard, Civil Engineer, 6, Millstone-lane, Leicester	do.
Fifteen Houses and Road Works, Blackwood, Mon.	Osborne Building Club	James & Morgan, Architects, Charles-street, Cardiff	do.
Sewage Works, Stonnall	Lichfield R.D.C.	W. E. Rogers, Surveyor, Rugeley	do.
Two Houses, Ferguson's-lane, Londonderry	.....	J. P. M'Grath, Architect, 28, Carlisle-road, Londonderry	do.
Paving Works, Devonshire-street West, Keighley	.....	W. H. Hopkinson, Civil Engineer, Keighley	do.
Granite Setts (250 tons)	Southampton Corporation	J. A. Crowther, Borough Engineer, Southampton	do.
Laying Water Main, Bradninch	Tiverton R.D.C.	R. Ellis, Engineer, Gold-street, Tiverton	do.
Storage Reservoir, Togan	Monaghan U.D.C.	J. L. D. Meares, Civil Engineer, Town Hall, Newry	do.
Alterations to Dispensary Stations, Glengall-street	Belfast Guardians	Young & Mackenzie, Architects, Belfast	do.
Boundary Wall, Lodge Estate	Rugby Freehold Land Society	J. F. Franklin, Architect, Regent-street, Rugby	do.
Stables, &c., Carey-street	Salford Corporation	Sharp & Foster, Architects, 28, Deansgate, Manchester	do.
Car Shed, Wallness-road, Broughton	do.	L. C. Evans, Town Hall, Salford	do.
Infirmary Buildings	Holsworthy (Devon) Guardians	J. Rowland, Union Offices, Holsworthy	do.
Retort House, &c., at Gasworks, Riverbank	Kilmarnock Corporation	W. Fairweather, Corporation Gasworks, Kilmarnock	do.
Tramcar Sheds, &c.	Rotherham Corporation	J. Platts, Architect, Rotherham	June 25
Sewerage Works	Bexley Heath (Kent) U.D.C.	T. G. Baynes, Public Hall, Bexley Heath	do.
Additions to Offices, Moss Side, Aberdeen	.....	A. Stronach & Son, 20, Belmont-street, Aberdeen	do.
Four Houses, Brook-street, Marsh, near Huddersfield	.....	J. Berry, Architect, Huddersfield	do.
Cast Iron Pipes and Specials	Kettering U.D.C.	T. R. Smith, Surveyor, Market-place, Kettering	do.
Rebuilding Vestry, &c., at Church, Hemyock	Rector and Churchwardens	S. Dobell, Architect, Queen-street Chambers, Exeter	do.
Stabling, &c., Wolsey-street	Ipswich Corporation	E. Buckram, Borough Surveyor, Town Hall, Ipswich	do.
Alterations to Schools, Redbourn	Managers	W. Collyer, High-street, Redbourn	do.
River Wall, Carey-street Depot	Salford Corporation	Borough Engineer, Town Hall, Salford	do.
Tenements, Dundee	Ancient Order of Foresters	Johnston & Baxter, Architects, 49, Meadowside, Dundee	do
Electricity Works, Prince Rock	Plymouth Corporation	Jas. Paton, Borough Engineer, Town Hall, Plymouth	June 26
Road Metal, &c.	Paisley Town Council	J. Lee, Civil Engineer, Paisley	do.
Causewaying Dixon and Arthur-street	do.	do.	do.
Conveniences, &c.	Cork County Borough Council	F. W. M'Carthy, Municipal Buildings, Cork	do.
Villa, Maescymmer, Wales	Mr. Thos. Jones	G. Kenshole, Architect, Station-road, Bargoed	do.
Schools, Langley Moor	Rev. Jos. Thorman	H. T. Gradon, Architect, 22, Market-place, Durham	June 27
School, Leadhills, N.B.	.....	Traill & Stewart, Architects, 1, Castlegate, Lanark	do.
Twenty-nine Houses, Thornton, Yorks	.....	M. Hall, Architect, 29, Northgate, Halifax	do.
Schools, Belmont Hill	Aberdeen School Board	J. A. O. Allen, Architect, 22, Union-terrace, Aberdeen	do.
Alterations to Tram Depot, Bloxwich-road, Birchills	Walsall Corporation	R. H. Middleton, Borough Surveyor, Walsall	June 28
Water Supply Works, near Macclesfield	Bollington U.D.C.	W. H. Radford, Civil Engineer, King-street, Nottingham	do.
Sewage Disposal Works, St. Bernard's	Walsall Corporation	J. R. Cooper, Town Hall, Walsall	do.
Widening Bridges, Willenhall	Bedwas (Mon.) School Board	J. H. Phillips, Architect, Windsor-place, Cardiff	do.
Alterations to Schools	Alexandra Building Club	G. Kenshole, Architect, Station-road, Bargoed	do.
Fifteen Houses, New Tredegar	Rev. J. T. Beynon	R. W. Thomas, Architect, Llandrindod Wells	do.
Vicarage House, Llanbedr, Painscastle, Radnorshire	Dewsbury Corporation	H. Dearden, Engineer, Town Hall, Dewsbury	do.
Cast Iron Pipes (136 tons)	Messrs. Marshall & Son	W. J. Jenkins, Architect, Bodmin	do.
Additions to Business Premises, Bodmin	Mr. G. T. Bowden	Pearse, Jenkin & Son, Trewirgie, Redruth	do.
Additions to Farm Buildings, Wendron, Cornwall	Newcastle-upon-Tyne Corporation	C. S. Errington, Arcnt., Grainger-st. West, Newcastle-on-Tyne	June 30
Public Conveniences, St. Nicholas-street	Great Northern Rlwy. Co. (Ireland)	T. Morrison, Amiens-street Terminus, Dublin	do.
Five Cottages, Moira and Belfast	Gildersome (Yorks) U.D.C.	J. Waugh, Civil Engineer, Sunbridge Chambers, Bradford	do.
Sewage Disposal Works, St. Bernard's	Rochford Union	Greenhalgh & Brockbank, Architects, Southend-on-Sea	do.
*Erection of Laundry at Workhouse	.....	Tennant & Bagley, Architects, Pontefract	do.
Schools, Tansheif, Pontefract	Rochford (Essex) Guardians	Greenhalgh & Brockbank, Architects, Bank Chambers, Southend	do.
Additions to Workhouse	Morley (Yorks) Corporation	W. E. Putman, Civil Engineer, Town Hall, Morley	do.
Tar Macadam, Dartworth Park	Littleport (Ely) Parish Council	H. G. Martin, Surveyor, Littleport	do.
Chapel at Cemetery	Kingston-on-Thames Guardians	J. Edgell, Union Offices, Norbiton, Kingston	do.
Shed, &c.	Trevethin School Board	H. Bythway, Pontypool	do.
Additions to Schools, Abersychan	Basford Guardians	W. V. Betts, Architect, Bank Offices, Old Basford	do.
Additions to Workhouse	Wallasey U.D.C.	W. H. Travers, Engineer, Public Offices, Egremont	do.
Tramways Office, Seacombe Ferry	Cheshire County Council	H. F. Bull, The Castle, Chester	do
Widening the County Bridge, Dukinfield	Hastings Corporation	P. H. Palmer, Civil Engineer, Town Hall, Hastings	do.
Portland Cement (1,500 tons)	Bolton-upon-Dearne U.D.C.	J. L. Hawksworth, Bolton-upon-Dearne	do.
Street Works, Goldthorpe, Yorks	Sandal Magna U.D.C.	F. Massie, Civil Engineer, Tetley House, Wakefield	do.
Drainage Works, Portobello-road	Prestwich (Lancs) U.D.C.	Surveyor, Chester Bank, Prestwich	do.
Sewers, &c., Bury New-road	East Dereham U.D.C.	H. G. Himson, Surveyor, Theatre-street, East Dereham	do.
Granite Road Metal (650 tons)	Farnborough U.D.C.	J. E. Hargreaves, Surveyor, Farnborough	do.
Surveyor's Materials	Tottenham U.D.C.	Council's Engineer, 712, High-road, Tottenham, N.	July 1
*Making-up Roads, &c.	Cricklade Guardians	R. J. Beswick, Architect, 35, Regent-street, Swindon	July 3
Alterations to Workhouse, Purton, Wilts	Manchester Dock, &c., Co., Ltd.	W. H. Hunter, Civil Engineer, 41, Spring-gardens, Manchester	do.
Dock Works, New Barns, Salford	Bethnal Green Council	Chief Inspector, Town Hall, Bethnal Green	do
*Dust Pails and Cast Iron Manholes	Llantrisant School Board	J. Rees, Architect, Pentre, Rhondda	July 4
Additions to Schools, Gillach Goch, Wales	Glasgow & W. Scotland Tech Coll.	The Secretary, 28, Bath-street, Glasgow	July 5
*Wright Work of New Buildings for College	Governors	H. F. Stockdale, 38, Bath-street, Glasgow	do.
College Buildings, George & Montrose-streets, Glasgow	Ipswich Corporation	Kennedy & Jenkin, Engineers, 17, Victoria-street, S.W.	do.
Electric Lighting Works, Constantine-road	Lewes Town Council	Borough Surveyor, Town Hall, Lewes	do.
Road Metal (1,000 tons)	Epsom Rural District Council	Beesley, Son & Nichols, 11, Victoria-street, Westminster	July 9
*Completion of Bacteria Beds for Sewage Disposal	Exeter Council	Sir John Wolfe Barry, 21, Delahay-street, Westminster	July 14
*Bridge over the Exe	Cheltenham Borough Council	Water Works Engineer, Municipal Offices, Cheltenham	July 16
*Supplying and Laying Cast Iron Water Main	St. Pancras Guardians	A. E. Pridmore, Architect, 2, Broad-street Buildings, E.C.	July 17
*Coach House, Stabling, &c.	Bucks War Memorial Committee	County Surveyor, County Hall, Aylesbury	July 19
*Stone Monument	.....	E. H. Back, Civil Engineer, Dartmouth	No date
House, Deadman's Cross, Dartmouth	Ware Union	C. Smith & Son, Architects, 164, Friar-street, Reading	do.
*New Vagrants' Block at Workhouse	Billinge Urban District Council	A. Darlington, Surveyor, Council Offices, Billinge	do.
Boiler House, near Billinge Hill, Lancs	.....	Crickmay & Sons, Architects, 13, Victoria-street, Westminster	do.
Three Houses and Five Shops, Bush Hill Park, Enfield	.....	Rev. D. Davies, Florida Villa, Clydach, R.S.O.	do.
Heating Methodist Chapel, Clydach, Swansea	Finedon (North Hants) U.D.C.	Mosley & Scrivener, Engs., Fish-street Chambers, Northampton	do.
Water Supply Works	.....	W. Wrigley, Architect, 6, Westgate, Wakefield	do.
House, Bradford road, Wakefield	Royal Norfolk & Suffolk Yct. Club	G. J. & F. W. Skipper, 7, London-street, Norwich	do.
*New Club House, Lowestoft	Metropolitan Railway Company	Secretary, 32, Westbourne-terrace, W.	do
*Electrical Power House, Neasden			

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Senior Surveying Assistant	Manchester Corporation	220*l.*	June 30
*Assistant Quantity Surveyor	do.	200*l.*	to
*Three Examiners	Sanitary Inspectors' Exam. Board	Not stated	July 10
*Sanitary Inspector	Camberwell Borough Council	117*l.*	July 8
*Temporary Clerk of Works, Scilly Islands	War Department	7*s.* 6*d.* per diem	July 15

Those marked with an asterisk (*) are advertised in this Number. *Competitions, p.* iv. *Contracts, pp.* iv. vi. viii. *& x.* *Public Appointments,* xviii. *& xix.*

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PRICES CURRENT (*Continued*).

VARNISHES, &c.	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work ..	0 16 0
Best Elastic Copal Varnish for outside work ..	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work.....	0 10 0
Best Extra Hard Church Oak Varnish for inside work.....	0 10 6
Fine Hard Copal Varnish for inside work.....	0 16 0
Best Hard Copal Varnish for inside work.....	1 0 0
Best Hard Carriage Varnish for inside work....	0 16 0
Extra Pale Paper Varnish	0 18 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting.....	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

W. V. A.—W. C. (Amounts should have been stated).

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article is given subject to the approval of the article, when written, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Next week's communications for insertion under this heading must reach us *not later than 10 a.m.* on Tuesday, as, owing to the Coronation holidays, we go to press two days earlier than usual.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

ALDERLEY EDGE.—For the execution of street works, Duke-street, for the Urban District Council. Mr. Harold Sheldon, surveyor, Alderley Edge, Manchester:—

S. H. Burns, Alderley Edge*..... £270

BECKENHAM.—For works at electric lighting station, Arthur-road, for the Urban District Council. Mr. J. A Angell, surveyor, Council Offices, Beckenham:—

Neil & Co. ..	£1,325 8 7	Foster Bros.,	
H. Heathfield	1,055 0 0	South Norwood*	£914 0 0
Windsor & Co.	1,016 19 6		

BRADFORD.—For the erection of a shed, Eastwood Mills. Messrs. Empsall & Clarkson, architects, 7, Exchange, Bradford:—

Masonry and Bricklaying.
Strong & Co., Bradford*.....
Carpentry and Joinery.
J. Taylor, Keighley* .....
Steel and Iron Work.
Barrett & Sons, Bradford*.....
Plumbing and Glazing.
A. Ross, Shipley*..... £3,500
Plastering and Concreting.
A. Taylor, Eccleshill*.....
Slating.
W. Thornton, Bingley* .....
Painting.
T. Batty, Drighlington* .....

BRIGHTON.—For the supply of dressed granite kerb and channel (8,000 ft.), for the Town Council. Mr. F. J. C. May, C.E., Town Hall, Brighton:—

—	Description of Granite.	Edge Kerb, 6 in. by 10 in., at per ft. run.	Flat Kerb, 12 in. by 6 in., at per ft. run.	Channel, 12 in. by 6 in., at per ft. run.
		s. d.	s. d.	s. d.
Croft Granite, Brick, and Concrete Co., Ltd.	Leicester	1 4½	1 9	1 8½
Hughes & Co.	Scotch	—	1 6	1 6
A. & F. Manuelle	Guernsey	1 5½	1 8	1 7½
A. & F. Manuelle, London*.....	Norway	1 3½	1 4½	1 4
Brunton & Sons	Irish	1 3½	1 5½	1 5½
A. Robinson	,,	10½	1 1½	1 1½
W. Wilson.....	Norway	1 6	1 7	1 5
Goodchild & Co.....	,,	1 4½	1 5½	1 4½
Griffiths & Co., Ltd.	,,	1 4½	1 5½	1 4½
Blitchfeldt & Co.....	,,	1 4½	1 5	1 4½
Van Praagh & Co., Ltd.	,,	1 3½	1 4½	1 4

DAWLISH.—For the erection of stable, coach-house, &c., at Holcombe Hall, for Mr. Harrison Benn. Messrs. J. W. Rowell & Son, architects, Newton Abbot. Quantities by Mr. Vincent Cattermole Brown, Paignton:—

Lamacraft & Sons	£2,400 0	E. Andrews	£2,202 10
F. Friend	2,379 0	G. Lee, Teignmouth*	1,999 17
F. C. Francis	2,214 0		

DROITWICH.—For the supply of Rowley rag or other similar road material, for the Corporation. Mr. Hy. Hulse, Borough Surveyor, Droitwich:—

	Rough.	2 in. Broken.	1½ in. Broken.	Chips.	Cubes.
	s. d.	s. d.	s. d.	s. d.	£. s. d.
Croft Granite Co., Ltd.	7 11	9 11	9 11	6 5	1 14 4
Jees Hartshill Granite Co., Ltd.	7 6	9 0	8 6	7 0	1 12 0
Rowley Regis Granite Co.	6 3	8 3	8 6	5 6	1 4 6
D. Aston	6 5	8 5	8 3	5 3	1 4 0
J. W. Knowles	6 3	8 3	7 9	6 3	—
Clee Hill Granite Co.	6 9	9 0	9 6	7 3	1 3 10
Messrs. Field & Mackay.....	6 9	9 4	9 9	7 3	1 3 10
Clee Hill Dewstone Co.	6 9	9 4	9 9	7 3	1 3 10
Dotshill Granite Co., Ltd.	8 0	9 5	9 2	7 2	1 8 0
Whitwick Granite Co.	8 5	11 1	11 4	7 10	—
W. H. Jones	6 9	9 0	9 9	5 9	1 3 10
Ellis & Everard.....	9 9	11 3	11 9	8 3	—
W. Parker	8 6	7 6	5 10	5 10	—
The Tytherington Stone Co.	7 0	8 0	8 0	8 6	—
W. Element.....	7 2	9 0	9 0	6 6	1 5 0
Exors. Alf. Allen, Rowley Regis, near Dudley*....	5 6	7 6	7 6	5 0	1 3 0

DURHAM.—For making-up seven private streets in the Parish of Neville's Cross, for the Durham Rura District Council. Mr. Geo. Gregson, Surveyor to the Council:—

—	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
G. T. Manners	739 0 0	69 0 0	106 0 0	335 0 0	148 0 0	192 0 0	35 0 0
John Carrick	729 14 1	65 0 8	90 10 7*	332 18 1	146 2 9	187 6 7	33 6 1
J. G. Bradley	664 6 6*	60 11 11*	94 0 11	316 11 5*	131 6 10*	167 11 8*	30 2 4*

[All of Durham.]

DEWSBURY.—For the erection of boundary walls, &c., Headfield-road, Savile Town, for the Thornhill Urban District Council. Mr. S. W. Parker, Surveyor, Council Offices, Thornhill:—

Ellis P. Sheard, Thornhill..... £106

DUDLEY.—For the erection of boiler house and laundry at the Workhouse, for the Union Guardians. Mr. A. Marshall, architect, King-street, Nottingham:—

Willcock & Co., Wolverhampton	£10,420
W. Hopkins, Birmingham.....	9 900
Harley & Son, Smethwick.....	9,537
H. Dorse, Cradley Heath	9,500
Fish & Sons, Nottingham.....	9,492
Lindsey Jones, Wolverhampton	9,480
W. Harvey Gibbs, King's Heath.....	9,350
J. Mallin, West Bromwich	9,299
W. Crane, Nottingham	9,182
M. Round, Dudley.....	9,179
J. Dallow, Birmingham.....	9,125
J. Guest, Stourbridge.....	9,100
Windsor & Co., London	8,999
R. Merton Hughes, Birmingham	8,990
J. H. Vickers, Nottingham	8,968
Whitehouse & Sons, Birmingham	8,899
A. Colin Hughes, Birmingham.....	8,660
Oakley & Coulson, Dudley	8,685

EPSOM.—For the supply of road materials, for the Rural District Council. Mr. T. E. Ware, surveyor, Waterloo-road, Epsom:—

Norway Granite Kerb (*12 in. by 6 in.*).

Blichfeldt & Co., Water-lane, E.C.*:—

	per foot. s. d.
Banstead	1 4½
Bookham	1 5
Cheam	1 4½
Cobham	1 5

Blue Pennant Kerb (*12 in. by 4 in.*).

H. L. Cooper, Mark-lane, E.C.*:—

Cobham	0 8½

Thornton Heath Gravel.

Hall & Co., Croydon*:—

	per cubic yard.
Ewell	6 6
Cheam	6 6
Worcester Park	6 4

Thornton Heath Rough Gravel.

Hall & Co., Croydon* :—

Cheam	4 7‡

Hungry Hill Flints.

Farnham Gravel Co., Farnham* :—

Ashtead	7 3
Worcester Park	7 3
Epsom	6 11
Ewell	7 3
Oxshott	6 11

Farnham Fine Gravel.

Farnham Gravel Co., Farnham* :—

Bookham	5 0

W. Norris, Upper Hale, Farnham* :—

Leatherhead	5 2

Stoneware Pipes.

Knowles & Co., King's-road, St. Pancras* :—

	per yard run. s. d.		s. d.
4 in.	0 7 *ab* ..	0	7½ *cb*
6 in.	0 10½ *ab* ..	0	10½ *cb*
9 in.	1 5½ *ab* ..	1	5½ *cb*
12 in.	2 5½ *ab* ..	2	6 *cb*

‡ Subject to sample being satisfactory.
a Delivered to Banstead, Cheam, Cobham, Worcester Park, and Ewell.
b Subject to 2½ per cent. discount for cash.
c Delivered to Ashtead, Bookham, and Leatherhead.

EPPING (Essex).—For the erection of school buildings, St. John's-road, for the School Board. Messrs. Harrington & Ley, architects, 65, Bishopsgate-street Without, E.C.:—

Stephens & Bastow	£4,282 0	Oak Building Co.	£3,902 0
General Builders, Ltd.	4,229 0	Foster & Son	3,901 0
Thomas & Edge	4,217 0	Hawkey & Oldman	3,820 0
Smith & Son	4,195 0	A. Knight	3,812 0
Wilson & Lamplough	4,103 0	Foster Bros.	3,749 0
Chessum & Sons	3,962 0	B. E. Nightingale	3,748 0
Wells & Son	3,950 0	Hammond & Son	3,729 0
Hawkins & Son..	3,943 18	Keen & Sons	3,620 0
A. W. Robins ..	3,930 0	E. West, Chelmsford†	3,592 0
		Sims & Wood....	3,582 0

GUILDFORD.—For the erection of road works, New Cross-road, Stoke, for the Rural District Council. Mr. John Anstee, surveyor, Commercial-road, Guildford:—

Norris	£898 16 0	G. A. Franks,	
W. H. Wheeler	786 6 6	Guildford* ..	£740 10 7
Streeters & Todhunter	764 0 0	[Surveyor's estimate, £765 13 6]	

HEANOR.—For the erection of factory buildings for Messrs. J. Fletcher & Sons. Mr. A. Marshall, architect, King-street, Nottingham:—

Dickenson	£10,058	H. Vickers	£8,795
F. Messom	9,796	Warner	8,685
T. Barlow	9,702	Windsor & Co.....	8,399
Dennett & Ingle ..	9,450	Cooper & Son	8,350
Crane & Co.	9,244	Vickers & Co.	8,270
J. Woodsend	9,085	J. H. Williamson, Nottingham*	8,199
Fish & Sons	8,835		
J. Wright	8,820		

HENGOED (Glam.).—For the erection of six houses, for Messrs. Rees, Rees, & Co. Mr. P. V. Jones, surveyor, Hengoed, via Cardiff:—

T. F. Howells.....	£1,500	J. H. James, Cardiff*	£1,440
Williams & Son	1,470		

LONDON.—For the erection of schools, Montague-road and Houndsfield-road, for the Edmonton School Board. Mr. H. W. Dobb, architect, 99, Church-street, Lower Edmonton:—

	Montague-road School. £ s. d.	Houndsfield-road School. £
Appleby.....	25,320 0 0	24,560
Barker & Co.	27,930 0 0	26,600
Dearing & Son	24,275 0 0	22,861
Hockley & Co.	24,750 0 0	23,500
Johnson & Co., Wandsworth	22,976 0 0	21,419‡
Lawrance & Sons	24,358 0 0	22,974
Lawrence & Son.....	23,813 0 0	21,989
McCormack & Son.....	24,876 0 0	23,456
Nightingale	24,441 0 0	23,197
Oak Building Co., Cambridge.....	22,820 0 0‡	21,780
Messrs. Patrick	26,130 0 0	24,500
Porter & Son	22,962 0 0	21,671
Saint	25,911 0 0	24,783
Shillitoe & Son	24,000 0 0	22,900
Spencer Santo & Co.....	27,610 0 0	26,562
Stephens Bastow Co.....	24,647 0 0	23,222
Stimpson & Co.	24,313 0 0	22,922
Tonge.....	23,855 0 0	22,500
Wall & Co.	24,595 0 0	22,992
Willmott	25,890 0 0	24,990
Wisdom	23,711 1 10	22,448
Knight & Son	23,389 0 0	21,987
[Architect's estimate	23,163 0 0	21,319]

‡ Accepted subject to the approval of the Board of Education.

[*See also next page.*

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LONDON. — For alterations and additions to The Royal Pavilion Hotel, Woolwich. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, London. Quantities supplied :—

Osborn & Sons.....	£4,354	Thomas & Edge ..	£4,197
F. & T. Thorne	4,329	Green & Smith	4,196
Courtney & Fairbairn	4,289	Sheffield Bros.*	3,987
Todd & Newman ..	4,217		

LONDON.—For alterations at The Prince Alfred, Poplar. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, London. Quantities supplied :—

Osborn & Sons	£850	Harris & Wardrop....	£707
F. & T. Thorne.....	825	Sheffield Bros.....	670
Courtney & Fairbairn	765	Samuel Salt*	649

LONDON.—For the erection of a factory, London-road, Plaistow, for Messrs. H. Wheeler & Co. Mr. A. J. Wade, architect, 36, Fifth-avenue, Harrow-road :—

W. M. Norton.....	£3,295	Singster Bros.	£2,599
G. J. Hosking.....	3,027	H. C. Horswill	2,580
A. Daniels	2,990	W. J. Cottle	2,503
J. Groves	2,698	Edwards & Medway‡	2,455
J. W. Jerram	2,629	W. Crouch	2,450

[Architect's estimate, £2,500.]
‡ Accepted with basement added at £2,660.

LONDON.—For the erection of new premises, Nos. 62 to 65, Charing Cross, for the Canadian Pacific Railway Co. Mr. G. Richards Julian, architect. Quantities by Messrs. Fowler & Hugman :—

Foster & Dicksee ..	£18,884	Maple & Co., Ltd. .	£17,491
Colls & Sons	18,520	W. Downs	17,400
H. Line	18,267	G. H. & A. By-waters & Sons ..	17,366
Harris & Wardrop .	18,197	J. Carmichael.....	17,363
Treasure & Son....	18,130	Holloway Bros.....	17,240
J. Williams.....	17,987	Grover & Sons	17,171
Patman & Fotheringham.....	17,920	Patrick & Son	17,068
Lovatt	17,550		

MOUNTAIN ASH (Wales).—For additions, &c., to Duffryn Co-operative Stores, Commercial-street. Messrs. Morgan & Elford, architects, 1, Jeffrey-street, Mountain Ash :—

J. S. Griffiths, Barry Dock £580

OTLEY (Yorks).—For the execution of sewerage works, &c., for the Urban District Council. Mr. J. E. Sharpe, Engineer, Council Offices, Otley :—

Contract C.
Ward & Tetley, Bradford* £1,775 0 0

Contract D,
Blakeborough & Sons, Brighouse*.. 397 18 5

Contract E.
Ward & Tetley, Bradford* 126 12 3

RANSKILL (Yorks).—For alterations and additions to The Grange, for Mr. W. H. Ottley. Mr. Hall Ballan, architect, Doncaster. Quantities by Mr. Hoffman Wood, Park-square, Leeds :—

F. C. Close ..	£1,184 6 4	Dennis Gill & Son ..	£762
Mettam	1,060 0 0	C. A. F. Marrison....	720
F. R. Swaby	825 0 0	R. Stewart, Blyth† ..	630

RHONDDA VALLEY.—For the erection of forty-one houses, Ton Pentre, for the Industrial Co-operative Society, Ltd. Mr. W. D. Morgan, architect, Victoria-chambers, Pentre, Rhondda Valley :—

Alban Richards, Ton Pentre ..	£8,855 0	Morgan Bros., Ton Pentre, Rhondda*	£8,035 0
E. Jones, Cwm-parc, near Treorky	8,401 10	T. Reynolds, Ystrad Rhondda	7,625 0

ST. ALBANS.—For the erection of a Congregational church, at the junction of Victoria-street and Beaconsfield-road. Messrs. Smee, Mence, & Houchin, architects, 14, London-road, St. Albans. Quantities by Messrs. J. B. Colwill & Son, 6, Alma-road, St. Albans :—

Whibley & Jervis....	£8,862	Wilmot	£8,300
Baltley, Sons & Holness.....	8,600	Dunham	8,181
Boff Brothers	8,450	Miskin & Sons.....	8,173

SHEFFIELD.—For the erection of covered yard, shed and coopers' shop, Mowbray-street and Harvest-lane, for Messrs. Carter, Milner, & Bird, Limited. Messrs. Hall & Fenton, architects, 14, St. James-row, Sheffield. Quantities by the architects :—

Eshelby & Sons	£1,765 0	Mastin & Sons ..	£1,599 0
A. Moore	1,731 0	G. Allen	1,590 0
G. Webster.....	1,725 0	Martin & Hughes	1,583 0
G. Malpass	1,658 0	T. Margerrison..	1,545 0
T. Astling	1,654 0	Dyson, Son, & Gregory*	1,513 5
A. Bradbury	1,643 0		
Longden & Sons, Ltd.	1,619 0		

[All of Sheffield.]

SUTTON-ON-SEA.—For the erection of a house for Mr. H. H. Maddock. Mr. Hall Ballan, architect, Doncaster :—

F. Moore, Sutton-on-Sea* £570

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The Builder.

VOL. LXXXII.—No. 3959. JUNE 28, 1902.

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Monument, Colleoni Chapel, Bergamo ..... Drawn by Miss E. M. Green.
West Porch, Cremona Cathedral ..... Drawn by Mr. W. Curtis Green.

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The Paintings of Bramante at Milan.

THE Brera Gallery at Milan has recently succeeded in acquiring the singular series of colossal portraits which at one time formed the decorations of a chamber in the Palazzo Panigarola di S. Bernardino at Milan. These curious frescoes are almost unanimously attributed to the great architect Bramante, who, in his early years (about 1480) seems to have been a good deal employed in such decorative work. It is very singular that these remarkable frescoes should constitute almost the unique evidence of his skill as a painter, and that they should have hitherto attracted so little notice.

The frescoes represent nine figures about double life size, most of them youths with different attributes or emblems intended, perhaps, to portray the different occupations of a noble seigneur of the period. Two of the figures, which formed a frieze or decorative panel over a door, are labelled "Democritus" and "Heraclitus," and between them a globe or "mappa mundi" is represented, or it may be a circular window through which a map-like landscape is seen, but it is much dilapidated and indistinct. Democritus is represented with closed sunken eyes from which tears are issuing, whilst Heraclitus laughs with the peculiar expression of Leonardo da Vinci's smiling woman. The whole composition and architectural setting of the figures, with niches, friezes, &c., in the style of Mantegna, is of the usual fifteenth-century character. Flowing abundant hair and elaborated draperies in the style of Melozzo di Forli are combined with that microscopic detail in the flesh portions which becomes almost painful in an effort to represent the veins; the tears of Democritus are, of course, treated with all their correct lights and shadows in true pre-Raphaelite manner.

The history of these paintings is practically unknown, beyond some documentary evidence which merely seems sufficiently convincing as to their authorship.

Like so many great geniuses of the Renaissance, Bramante has left behind him little more than the name of a great architect; and that name was not, perhaps, recognised in all its importance until quite recent years. As the founder of a very remarkable school of architecture, Bramante has been exalted to a high rank by his fellow-countrymen for a long time past, and his name has become familiar to English architectural students of the present day. But of his actual life-history very little is known, and to many the fact of his very high ability as a fresco-painter has even come as a surprise. But although these frescoes recently bought by the Brera Gallery are the only examples of his skill with documentary evidence, Bramante is known to have painted in other buildings of Milan and at Bergamo.* Vasari also mentions his having worked in St. John Lateran, Rome.

Bramante hardly acquired very much fame as a painter, and these examples recently brought to light, although possessing all the strong, vigorous character of first-class Renaissance art, are not particularly pleasing. As an architect and the originator of a very ingenious type of architectural design, Bramante's name will ever remain in one of the most prominent places in the history of art. For centuries the great geniuses of the earlier Renaissance were somewhat eclipsed by such names as Michelangelo and Raphael, but during the nineteenth century, with its marvellous developments of art-study and criticism, these almost forgotten pioneers of the great revival were once more honoured with that public admiration which had been given them by their contemporaries; and Donatello, Baldassare Peruzzi, Brunelleschi, Leon Battista Alberti, and a host of other architects, including Bramante, have been given a position at least equal in popular estimation to that of Michelangelo. But although such was not the case until the latter half of the nineteenth century, as far as regards a more general public opinion, the name of the great Lombard architect (Lombard by adoption; being a native of Urbino) did survive in local estimation, and the number of churches in Lombardy which are attributed to his design is quite astonishing—indeed, at such a rate one would suppose him to have been the Gilbert Scott of his period. But, of course, when investigated, these supposed examples of his work admit of very little proof or verification, and probably few architects have been credited with so many buildings which in reality were merely designed and executed with the striking characteristics of his style, by contemporary or later imitators.

One of the most remarkable and original structures in Milan is the domical addition to the Gothic church of S. Maria delle Grazie, attributed to Bramante. In this case the striving for a lofty, spacious interior without the least reference to, or suggestion of, the more usual models of church design in those days, is very conspicuous; the almost total suppression of the "Orders" and any kind of columnar construction, whilst making use of the Classic type of moulding and the other ordinary classical details, is also very extraordinary. In such a building as this the effort seems to have been to invent a "new style," and probably it is about as near that attainment as such an effort can be.

This peculiar style of Bramante became popular—became, indeed, national for a long series of years—and the Bramantine churches of Lombardy have always been regarded with local pride and admiration. Fifty years after Bramante's death the whole world united in considering the mighty Florentine as the greatest and only true source of all inspiration in architecture, and his successors Barroccio and Bernini and their schools maintained an exclusive proprietorship of the domain of art until the coming of the Romanticists of the early nineteenth century. But still the memory of Bramante associated with the development of a specially local vigorous style of art has been preserved until the present; awaiting, it would seem, that recognition which it has received during the last few years. It is now realised how

* Lomazzo, the Vasari of Lombardy, in his "Trattato della Pittura," 1584, speaks of these works, which would seem to have been executed about 1490–1500.

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much he had to do with rendering the interior of St. Peter's a success in spite of the alterations and additions of later times, which have only tended to spoil the grand idea which originated to a very great extent in his first design. In visiting the old churches of Lombardy of the so-called Bramantine style, one is tempted to speculate on the unachieved design for the greatest of Christian temples. Nothing certainly could be much more different in every feature than the building of St. Peter's, as carried out practically in the style of Michelangelo, and the innumerable buildings scattered over Lombardy and some other parts of Italy which are usually spoken of as in the "Bramantesque style." On the one hand, we have that imposition of fixed rules of proportion, without regard to the scale of a structure or the uses to which it is put, which brought about the "Orders," and the slavish imitation of certain models chiefly to be found in Italy; on the other hand, there is this "Bramantesque" manner of design representing the most splendid characteristic of the Renaissance, its originality of invention, combined with practical appropriateness and meaning in every detail.

Donato Bramante enjoyed the full span of life (1444-1514), and he seems to have employed his time in the manner of his contemporary artistic brethren—by turns an architect, then a painter. In those happy days of art no hard-and-fast rule was drawn as to "professional training," and, in spite of civic guilds and craft rules, most men of genius did that which was right in their own eyes and suited them best. It is interesting to discover another instance of that union of the arts in the person of one man in the same way that they were united in Michelangelo, Raphael, Leonardo, and almost all the artists of those days. In our days such a union would, perhaps, be almost impossible in England, and still less possible in Modern Italy. A modern architect is hardly expected to be able to paint decorative frescoes, and a modern painter's notions of building are usually of a very primitive character—the artistic world has indeed changed since the days when Bramante toiled at representing his young barons and seigneurs in all their splendid vitality in the intervals of his architectural career.

It is remarkable that, although Bramante was so distinctly a "church architect" of those days, his paintings, as far as we know of them in the Sforza Castle and the Palazzo Panigarola in Milan, or at Bergamo, were of a distinctly neo-pagan character, and intended to glorify the memory of "philosophers" and the ancient mythology. Apropos of these newly-recovered paintings in Milan, it may be mentioned that a very similar series by Andrea del Castagno exists at Florence in the museum of S. Apollonia. In all probability such a mode of decorating a grand chamber of a mediæval palazzo was fashionable in the fifteenth century.

The "distacco" or removal of these frescoes from their original positions has been effected under the superintendence of the "Ufficio per la conservazione dei monumenti."

SOCIETY OF ARTS.—The Council of the Society of Arts offer the Fothergill Prize of 50*l.* and a silver medal for a paper on "Existing Laws, By-Laws, and Regulations Relating to Protection from Fire, with Criticisms and Suggestions." Further information can be obtained from the Secretary, Society of Arts, John-street, Adelphi.

THE PROGRESS OF THE EDUCATION BILL.

THE Coronation holiday, which was to have made a considerable break in the work of the Parliamentary session, has gone, but the present time still affords reason for the consideration of the present position of the Education Bill. Mr. Balfour announced last week that the Government had given up any idea of passing the Bill without an autumn session. This announcement justifies entirely the line which this journal has taken, in common with all who are interested impartially in the subject of education, that a measure for secondary—including in that term technical—education only should have been proceeded with during the present session. There is no doubt whatever that, had this course been followed, a secondary education bill could easily have been passed before the middle of August, and some approach to a uniform system of secondary and technical education could have been constructed.

At present the subject of secondary and technical education has advanced but little from its position at the commencement of the session. An important amendment was pressed on the Government by Mr. Hobhouse, to make it obligatory on the Local Authorities to provide a proper system of secondary education. It shows how little the Government have really at heart the improvement of education, that Mr. Balfour refused to accept an amendment which would have obliged backward counties and boroughs to have got into line with the more progressive bodies. It is clear that it is most desirable that there should be uniformity of system throughout England, and this can only be obtained if counties and towns which take little interest in the subject of education are obliged to follow the lead of the Local Authorities who appreciate the importance of the subject. Fortunately, among the more intelligent members on the Government side of the House there was a strong feeling in favour of the amendment, and so a compromise was arrived at by which the Local Authorities are to inquire into the subject of secondary education, in consultation with the Board of Education. But we see no reason why a backward county should not report that a better system of education is unnecessary, in which case there appears to be no means of providing the necessary system. There is no doubt this to be said against an obligatory clause, that it is exceedingly difficult, if a Local Authority is obstinately bent on doing nothing, to compel it to take action. Our columns frequently testify to the difficulty which the Local Government Board has to oblige Sanitary Authorities to construct a proper system of drainage. It is therefore possible that the amendment which Mr. Balfour accepted as a compromise may be as effective as a more drastic clause. For if a Local Authority does not fulfil its duty the practical remedy is for the central Government to take the work out of its hands; and this, under present conditions, it cannot do.

A very important amendment in regard to the financial side of the matter has been carried, by which Local Authorities are now obliged to spend the grant from the Treasury, known as the "Whisky Money," on secondary and technical education. In many places this has already been done, but in others it has been spent on the reduction of the rates. This certainly is a step in advance; unfortunately, however, in spite of much pressure from all sides of the House, the Government have refused to enlarge the powers of rating by Local Authorities beyond the limit of twopence. As was pointed out in the debate on this subject, it is a great mistake to hamper progressive districts, but there is evidently a fear lest a larger power of rating should make education unpopular with the local tax-payer.

As regards the subject of primary education, it is sufficient to say that it has been decided to make a larger grant from the Treasury. Anything which tends to making primary education more efficient necessarily affects the important question of a system of secondary and technical education, and so far this grant is a step in advance, but it must be accompanied by more general control.

NOTES.

Coronation Honours.

IN spite of the lamented illness of the King and the consequent postponement of all the Coronation ceremonies, the list of Coronation honours has been published, and they will date as from Thursday, the 26th inst., the intended day of the Coronation. We are glad to see that there seems at last to be some intention of paying a little more regard to artistic merit, in the distribution of such honours, than has formerly been the case. Sir Hubert Parry, the eminent composer, and Sir E. Poynter, the President of the Royal Academy, are created Baronets; Mr. W. Emerson, the out-going President of the Institute of Architects, receives a Knighthood, which we hope we may take as an indication that architects are not in future to be entirely overlooked; and a similar honour is conferred on Mr. Ernest Waterlow, the President of the Society of Painters in Watercolours (and one of the best contemporary English landscape painters), and on Mr. Villiers Stanford, the composer.

The National Portrait Gallery.

IN their annual report the Trustees of the National Portrait Gallery complain of the quite inadequate amount (950*l.*) which is granted to them by the Treasury. There is no doubt that such a limited amount must frequently prevent the acquisition of interesting and important historical pictures; while it has also a tendency to cause expenditure on cheap and second-rate portraits. There are already a certain number of portraits hardly worthy of being preserved in this National Gallery; and what we should like to see would be a larger grant every year, which should be allowed to accumulate, so that a considerable sum should from time to time be spent on really important pictures. The enormous prices paid this season at Christie's for important portraits make the question of this grant quite an urgent matter. Fortunately the subjects of the portraits for which great sums have lately been paid have not been historically famous.

The Embankment Tramway.

THOSE who oppose the making of a tramway on the Victoria Embankment will no doubt be gratified by the action of the House of

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Lords. When the County Council's Tramways Bill came on for second reading in that House, an instruction to the Committee was carried to the effect that they should expunge the clause of the Bill which permitted the construction of a tramway from Westminster Bridge to Waterloo Bridge. This is not only a piece of pure class legislation, but little better than an insult to the House of Commons; and the decision was not arrived at after careful investigation, but after a short debate, in which the old and foolish arguments against the tramway were used. In the House of Commons, as we have noted, this particular clause was carefully investigated by a very competent committee. The piece of tramway in question is of great public importance, because it would be the connecting link between the systems north and south of the Thames. By their action in this matter the House of Lords have shown that they arrive at some decisions, at any rate, by prejudice and not by reason.

What is an Accident?

ONE of the questions which has caused much litigation under the Workmen's Compensation Act is, What is an "accident;" and what connexion must exist between it and the injury or death of the applicant? It has early been decided that for any occurrence to be an accident it must be fortuitous and unexpected, and this definition has never been questioned; but considerable difficulty has been experienced in determining the causal connexion that must exist between the accident and the death, and whether the accident must be the immediate or proximate cause in accordance with the legal maxim, *Causa proxima non remota spectatur*, or whether the *causa remota* can be regarded. This question has arisen in cases where there was either some illness or weakness inherent in the man himself, as in Hensey *v.* White; or where another cause, such as blood-poisoning, has supervened on the accident, as in Thompson *v.* Ashington Coal Co. The latest case on the subject is Dunham *v.* Clare, decided by the Court of Appeal on June 5 last. In this case a man had injured his toe on September 2, erysipelas had set in on the 17th, and the man died on the 27th. His employers endeavoured to show this was caused by his overwalking, but the County Court Judge, on the medical evidence—which was to the effect that the erysipelas was not a necessary or usual consequence of such a wound, and never supervened longer than ten days after the introduction of the germ to which it always owed its origin—found death not to have been the natural and probable result of the accident. The Court of Appeal remitted the case, with the direction that death might "result from the injury," under Schedule I. (*a*) of the Act, which uses those words, even although it was not the probable or natural result of the accident, and that unless, as a fact, some new cause could be found to have intervened so as to break the chain of causation, the accident would be the cause of death. From a consideration of the cases it seems that under the Workmen's Compensation Act it is the efficient cause or *causa sine quâ non*, which has to be regarded in such cases.

Technical Education, Scotland.

A PARLIAMENTARY Return has just been made in respect of the allocation of funds by local authorities in Scotland on behalf of technical education in that country. The total amount expended during the twelve months 1900-1 was 61,700*l.* 9s. 8d., and of that total a sum of 16,072*l.* 17s. 3d. was received by various secondary education committees; whilst the total amount available, including a balance in hand, with contributions under the Education and Local Taxation Account (Scotland) Act of 1892, and from other sources, was 81,958*l.* 13s. 11d. No sum had been applied to either the building or the maintenance of science and art schools, art galleries, or museums out of the local rates under the Public Libraries Acts. On the other hand, for the twelve months, 1899-1900, sums of 62,447*l.* and 25,153*l.* were respectively applied to the advancement of technical education and to the relief of rates, out of a total residue grant of 87,600*l.* paid to the several local authorities. Of the thirty-three County Councils, twenty-six applied the whole of their grants to technical education, and three devoted them entirely to relief of rates. Of the 206 burghs and police burghs, eighty applied the whole to relief of rates, and fifty-three the whole, and seventy-three a part, of the residue grants to technical education. Four County Councils gave a part of their grants to the last-named object.

Irish Peat and Electrical Energy.

A MOVEMENT is on foot to turn the Irish peat bogs to economical account, it being maintained that a great impetus would be given to certain industries in Ireland were the turf converted into electrical power at convenient spots. It is thought that by canalising the bogs the fuel could be delivered at those points cheap enough to compete with coal. This is by no means an original suggestion, but savours of the opinions held by prominent Irish geologists some seventy-five years since. An important factor, however, is that in those days there were no railways, and water carriage was the only feasible method of getting the turf from the bogs to more convenient centres. There is no doubt that peat is a valuable asset in Ireland. Except here and there, it has been practically untouched, and that it could be utilised with advantage is unquestionable. We must also recognise that as the country roads are so frequently made on a peat foundation, no heavy loads can be dragged along many of them. Consequently, even light traction engines cannot be brought into requisition, except in very few localities. But whilst we thoroughly agree that more of the fuel could be used to greater advantage than at present, and may be made suitable for the generation of electrical energy, the solution of the carriage problem seems to us to lie rather with the further development of light railways than in the construction of waterways. It is maintained that by the use of turf as fuel we shall see provision made for the generation of electrical energy applicable to every form of industrial activity, not only for railways, tramways, factories, heating and lighting of towns, &c., but also not improbably in the near future to most agricultural operations. Without being quite so sanguine about all these things coming to pass, and without endorsing the opinion that the quantity of peat in Ireland is practically inexhaustible, we may concede that if the question of carriage could be satisfactorily disposed of, the material would be in much greater demand in industrial centres than it is at present.

Austrian Canals.

AT a time when artificial waterways in Great Britain are generally neglected, purposely or otherwise, it may be instructive to observe that foreign nations are by no means slow to recognise the many advantages offered by canal navigation. As one indication of this enlightened perception, we may mention the important system of canals whose construction has recently been approved by the Austrian Government. The scheme provides for canals from the Danube to the Oder, from the Danube to the Moldau, from the Danube-Oder canal to the Upper Elbe, and from the Danube-Oder canal to the Vistula and the Dneister. Altogether about 1,000 miles of navigable waterways are to be constructed by the State, with the co-operation of provincial and municipal authorities. These important works are to be commenced at the latest during the year 1904, and the entire system is to be completed within twenty years. The total cost of construction is estimated at about 30,000,000*l.*, provision for this considerable sum being contemplated partly by contributions from Local Authorities, and partly by the issue of Government bonds. The canals are to be designed for the admission of vessels up to 600 tons burden, and the undertaking will bring the various provinces of the empire into closer touch, besides affording economical traffic communications with Germany and Russia. To quote the words of the United States Consul General at Vienna, it "will do more than anything yet enacted in Austria to promote the commerce of the country."

Electric Motor Car Dangers.

THE announcement that Messrs. Siemens and Halske have completed a new electrical motor car with which they hope to attain a speed of 105 miles an hour, reaches us at the same time as a full description of a fatal accident with a fast electric car in America. During a speed contest of electric motor cars at Staten Island, one of the cars suddenly swerved from the track and, plunging into the crowd, killed two people and fatally injured many others. The car, which weighed 3,000 lbs., was built like a torpedo on two pairs of wheels, its height from the ground being barely 6 in. The wheels were 3 ft. in diameter and were furnished with 3½ in. Palmer tyres. In the centre of the car was a small conning-tower with mica windows, which contained the two drivers. The electric motor was nominally 7 h.-p., but could develop much higher speed for a short time. In the race, when going at a speed of 75 miles an hour, it hit something on the road, which made it jump in the air and come down with a thud, doing damage to one of the wheels. It instantly swerved to the side, and, although the brakes were at once applied, it dashed through the crowd at the side of the track before almost any one had realised that anything was wrong. It seems to us that making electric motor cars specially for very high speeds is very foolish. The problem is an easy one, as exceedingly high speeds can be got by rapidly discharging accumulators when economy and efficiency are not considered, and no experimental demonstration of this elementary fact is necessary. The market for

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these high-speed cars must be an exceedingly limited one, and if they are made merely for purposes of advertisement, then it is well that people should know what a worthless proof of good workmanship a high-speed motor car is.

Permeable Walls.

EVERY one knows that air passes through the walls and ceilings of a closed room, and as long ago as 1878 it was proved that the rate of penetration depended mainly upon the excess of temperature of the inside air over that of the outside air. With walls of ordinary thickness it was observed that about one twenty-fifth of the atmospheric contents of a room would be changed for every degree Fahr. difference per hour. Thus, if the outer air were at 35 deg. Fahr., and the air in the room at 60 deg. Fahr., the latter would be completely changed in the space of one hour by transpiration through the walls. More recent enquiry seems to show that in the case of papered walls, it would not be safe to assume that much more than one-eightieth of the air will be changed per deg. Fahr. per hour. Further, it is the fact that walls covered with paper containing oil varnish or a coating of paint offer considerable resistance to the passage of air. As very little provision is designedly made for ventilation in ordinary dwelling-houses, and especially in those at low rentals, the subject to which we now allude may well be considered by architects. The employment of reasonably porous building materials is clearly calculated to exercise a beneficial influence upon the atmospheric conditions of a dwelling-house, or other building.

An Ancient City.

SITUATED at an elevation of some 7,000 ft. above sea level, in the Indian reservation of the United States, is the ancient city of Zuni, inhabited by the remnant of a race which still perpetuates the ancient civilisation of North America. The square, fortress-like buildings rise terrace above terrace to the summit of a hill, giving to the city a wonderfully commanding appearance. There are probably few places in the world of more interest to the archæologist than this unique and little-known relic of the past. Within its walls are narrow, winding thoroughfares, and irregularly-shaped piazzas, all of which possess characteristic names. The city is built of red sandstone cemented with red adobe clay, and in addition to dwelling-houses, it contains a religious dancing-place designed somewhat on the plan of a coliseum. Most of the houses are constructed in what are virtually terraced blocks of flats, and there are ladders everywhere giving access to the different stories. Upon the roof of each flat are clay chimneys forming flues for the fireplaces below. The fire-places very much resemble those found in old-fashioned English houses, and a slab of stone supported above the fire serves the purpose of a stove. Furniture is unknown, but native rugs and blankets cover the walls and carpet the floors. The Zunis, who are devoted to agricultural pursuits, do not court publicity, and up to the present time only two white men have dwelt in this strange city on the Sierras.

The Vache Park Estate, Chalfont St. Giles.

THIS property, which comprises a beautifully-timbered park, several farms, and woodlands, covering over 1,000 acres in all, is offered for sale. It is situated on the west side of the road from Chalfont St. Giles to Latimer and Chenies, near the brow of the hill which overlooks the valley through which runs the Misbourne, and commands the view extending from the Chilterns, Amersham, and the Shardeloes Woods northwards to Windsor and the Berkshire hills in the south. Some portions of the manor house, quadrangular on plan, and covered with ivy, are of the fourteenth century in date, but the greater part has been built since. In 1360 the property belonged to Sir Richard de la Vache to whom Edward III. granted free warren in all his demesne in Chalfont St. Giles; from that family it passed by sale in 1505 to the Crayfords, and from them to the Gardyners, who sold it, 1564, to Thomas Fleetwood. In the church is a fine brass, with his two wives and eighteen children, of Thomas Fleetwood (*obiit* 1570), ancestor of the distinguished Parliamentarian General and of Colonel George Fleetwood, who was attainted of high treason at the Restoration for having signed Charles I.'s death warrant. Charles II. gave The Vache to his brother James, Duke of York, who sold it, 1665, to Sir Thomas Clayton, Warden of Merton College, Oxford, the well-known Justice who persecuted Thomas Ellwood and other Quakers in that neighbourhood. From the Claytons the estate passed to Dr. Francis Ware, Chaplain-General to the Duke of Marlborough's army, and afterwards Bishop of Chichester and Dean of St. Paul's. In 1771 it was purchased by Admiral Sir Hugh Palliser, Bart., the earliest patron and friend of Captain Cook, to whose memory he erected a monument there. His son sold it in 1825 to Thomas Allen, of Newlands, in whose family it has latterly continued. On Milton's cottage at Chalfont are the Fleetwood coat of arms. David Fleetwood, of the Vache, sold it for 63*l.* by deed dated April 27, 1683, to Thomas Cock, a carpenter. The cottage was re-instated for the trustees, under Mr. J. Oldrid Scott's superintendence, a few years ago.

Illustrations of the New Forest.

AT the Modern Gallery in Bond-street is a collection of paintings of New Forest scenery, by Mr. H. Forbes Witherby; forty-one oil-paintings and thirty-nine water-colours. The oil-paintings are partly arranged in a consecutive order to represent the aspect of the New Forest during successive months of the year. We do not, however, find any view conveying an idea of the wonderful richness of colour to be seen in wide stretches of the forest in the later autumn, when the foliage is fading. We have seen effects there, when looking from high ground over a considerable stretch of country, which would hardly be credited if represented in painting; and certainly there is nothing like them here. Generally speaking, the oils are rather hard in style; among the most effective are "The East Wind over the Moor" (7); "The Young Fern" (15)—an early June scene; and "A Wayside Garden" (21). We prefer the watercolours to the oils; among them "The Promise of Spring" (45) and "Holmsley Valley" (51) are especially good.

The Woodbury Gallery.

AT the Woodbury Gallery in Bond-street is a small dual exhibition. "The King's Ships," by Mr. Seppings Wright, is a small collection of slight but clever sketches of modern men-of-war. The other exhibition, of the works of an Australian artist, Mr. Percy F. S. Spence, is of much more artistic importance. There is real power in some of these, and considerable originality of style; see especially "The Boundary Rider" and "The Hillside."

Old Theatrical Portraits.

AT the Society of Fine Arts is an interesting collection of portraits of actors and actresses of the early part of the last century, made by Samuel de Wilde, and collected together originally by the elder Charles Mathews, at whose death the collection was sold as a whole, and is now again offered for sale, but not necessarily as a whole. It would be a great pity that it should be broken up, as its real value is historical rather than artistic; no single portrait in the collection is of much value as a work of art, but the whole series forms a very interesting representation of the personages, and in most cases the stage costumes, of the generation of actors who were admired or criticised by Charles Lamb and his compeers.

COMPETITION FOR TOWN HALL, HARROGATE.

IN the instructions to architects the building required by the Town Council of Harrogate was described as the "Proposed New Town Hall." It is, however, both more and less than this. In addition to the municipal offices and Council chamber, a police-court is included in the scheme, and also a public library; on the other hand, there is no large hall for receptions, dinners, and public entertainments. If a hall of this kind had been required, the entrance-hall and principal staircase might well have been of a monumental character, but to provide a grand staircase of elaborate design as an approach to the secondary municipal offices, as some of the competitors have done, is obviously a mistake, particularly when the limit of cost is taken into consideration. There can be little doubt that the assessor, Mr. Macvicar Anderson, has been compelled to exclude a large number of designs for the simple reason that they could not be carried out for 40,000*l.*, the amount stated in the conditions.

The site is an oblong, about twice as long as it is broad, bounded on the east end by Station-parade, on the south side by Victoria-avenue, and on the north side by Raglan-street, the least important of the three frontages. At the west end there is another building plot. The site is not quite rectangular, but many of the competitors have obtained a rectangular plan by setting back the building lines where necessary. A more compact plan, covering a smaller area of ground, has thus been obtained, and the difficulties of external treatment attending an irregular plan have been avoided.

The first premium of 150*l.* has been awarded to Mr. Henry T. Hare, of London, for design No. 19. The author has evidently given careful consideration to the question of cost, and this has probably gone a long way towards gaining him the first place. Nearly all the competitors have planned their buildings to give two-storied frontages to the whole of the three streets, in addition to the rooms in the basement. Mr. Hare has two-storied frontages to Station-parade and Victoria-avenue only, the Raglan-street front and the central portion of the block being of one story only. This arrangement has been rendered possible by the thorough utilisation of the basement floor. It has the advantages of keeping down the cost of the building, and of allowing toplights to be used for lighting the central ground-floor rooms and corridors. On the other hand, the Raglan-street frontage suffers, and additions can only be made at the expense of the lighting of the ground-floor.

The principal entrance is in the centre of the station-parade front, and leads through a vestibule (with rooms for telephone and porter to the right and left respectively) to the entrance-hall, 44 ft. by 18 ft., placed trans-

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versely and consisting of three domed and toplighted bays. From the central bay, opposite the principal entrance, the principal stairs lead through the base of the tower to the first floor; the stairs to the basement are entered from the back of the right-hand bay, and the main corridor, 15 ft. wide and divided into eight domed and top-lighted bays, leads from the back of the left-hand bay to the Council chamber, committee-rooms, &c. The Borough Accountant's department is entered from the right-hand end of the entrance-hall, and is in communication with the public rates office on the Raglan-street front. The rates office, 54 ft. 6 in. by 27 ft., is well arranged with a separate entrance for the public in the middle of the external wall, and a U-shaped counter, enclosing the public space in front of the entrance. The Town Clerk's department is entered from the left-hand end of the entrance hall, and is, therefore, conveniently placed in relation to the Councillors' corridor. Along this corridor on the left hand are the deputation-room, smaller committee-room, Mayor's parlour, larger committee-room, and Councillors' retiring-room, with frontages to Victoria-avenue. The Council chamber is entered from the same corridor, immediately opposite the Mayor's parlour, and extends to the Raglan-street front. The police court adjoins the Council chamber, and is of the same size, and an entrance, with circular staircase for access to the public galleries of the chamber and court, is planned at the Raglan-street end of the division wall between the two rooms. The space between the entrance hall and the Council chamber is devoted to the staircases already mentioned, private rates office, strongroom, ladies' retiring-room, Councillors' lavatories, and a small open area.

The police court itself is well arranged; a flight of stairs leads down from the dock to the prisoners' room in the basement. The police-court department is entered from Raglan-street to the west of the court itself, and includes, in addition to the court, an entrance-hall and rooms for witnesses, jury, Magistrates' Clerk, and Magistrates, all top-lighted. The Magistrates' room is a continuation of the Councillors' corridor, and can be entered therefrom—a very convenient arrangement. The lavatory accommodation for witnesses might be improved.

The public library is placed at the west end of the site, and extends from Victoria-avenue to Raglan-street. It is entered from Victoria-avenue, the lending library being to the left of the passage leading to the reading-room; both these rooms have windows and toplights. The staircase to the right of the entrance leads up to the first floor, where the reference library, librarian's office, and small book-store are placed along the Victoria-avenue front. We did not notice any lavatory accommodation for the public; the staff lavatories are in the basement.

The first floor plan consists of a [-shaped portion at the Station-parade end, and a narrow range of rooms on the Victoria-avenue front. The three offices and plan-room of the Electrical Engineer's department are in the angle formed by Station-parade and Raglan-street, and the Waterworks Engineer's department is at the other end of the Station-parade front. The Borough Engineer's offices and plan-room are arranged along the Victoria-avenue front, the corridor being placed against the external wall and top-lighted, as the design of the elevation does not admit of any windows; the offices are lighted by windows over the roofs of the one-storied rooms in the middle of the block. The office lavatories are on this floor, over the main corridor on the ground floor.

The basement contains the caretaker's rooms, Sanitary Inspector's and pay offices, and rooms for the heating and ventilating apparatus, weights and measures, testing, and prisoners, in addition to storerooms, air-ducts, &c. Entrances are provided from Raglan-street and Victoria-avenue, and a staircase leads up to the main entrance-hall on the ground floor.

The elevations are of a monumental Renaissance character. That to Station-parade is symmetrical with the principal entrance in the middle of the ground story. The entrance is arched, and has a three-quarter column and pilaster on each side, crowned by an entablature and segmental pediment, above which is a large pedestal supporting sculptured figures 12 ft. high, which seem to dwarf the whole design. The central portion of the front is one story high for a depth back of about 30 ft. The side portions are two stories high, and a range of buildings of the same height is carried around the three sides of the central portion. Each side block has on the lower story a three-light columned window, with a triangular pediment over the central light, and large seated figures above. The main cornice is continued from the side blocks around the recessed portion of the front, and the tower rises directly from the unbroken line of the plinth of the balustrade or attic above the cornice. This is not a commendable method of treatment, as the tower appears to be merely stuck on, instead of being an integral part of the design.

The Victoria-avenue front is a dignified piece of work with projecting bays at each end and near the centre, and with the main entablature similar to that of the Station-parade front. As already explained, there are no windows on the first floor on this elevation. The central feature contains the segmental bay window of the mayor's parlour, and has a triangular pediment above the main cornice, and a low dome over. There are five windows on the lower story on each side of the bay, with columns, entablatures, and pediments (alternately segmental and triangular). On this side, and on the recessed portion of the front, the balustrade is open.

The Raglan-street elevation is less satisfactory.

The second premium of 100*l.* has been gained by Messrs. Waddington, Sons, & Dunkerley, of London and Manchester. Their design (No. 51) is a good one, but shows a more costly building than Mr. Hare's. About two-thirds of the ground floor is occupied by the municipal offices and council chamber, the latter being in the centre of this portion, with corridors on three sides, that at the end nearest the Station-parade entrance having top lights, and those at the sides being dependent to a large extent on borrowed lights in the walls of the offices. The Borough Accountant's department is in the middle of the Raglan-street front, but the public rates office is a narrow room placed transversely in the rear of the council chamber, and is not as convenient as that shown in the first premiated design. The Committee-rooms, deputation-room, councillors' retiring-room, and Mayor's parlour, are placed *en suite* along the Victoria-avenue front.

The police-court department extends across the building in the rear of the municipal offices, the court itself being in the middle, with jury and witnesses'-rooms on the Raglan-street side (with the caretaker's house over) and magistrates and clerks' rooms on the Victoria-avenue side. There is no communication between this department and the municipal offices. The library also extends across the site, at the west-end, and has a large and small newsroom on the ground floor, and reference and lending libraries and librarian's office on the first floor. The staff entrance and staircase to the lending library are awkwardly placed between the magistrates' clerk's room and the municipal offices. With the exception of the end of the newsroom in the Raglan-street front, a range of rooms (chiefly offices) is carried all round three sides of the building on the first floor.

The external treatment is less massive than that of the first design, but is also less conventional. A well designed clock-tower, 22 ft. square and almost 140 ft. high to the top of the finial, is placed at the corner of the Station-parade and Victoria-avenue fronts. At the height of nearly 70 ft. consoles are introduced on each face, from which coupled rusticated columns rise to the main entablature. Seated figures are placed at the angles above to mask the change from square to octagon, and between them are segmental pediments. Above these is an open stage with columns and pilasters supporting an octagonal dome, which is surmounted by a cupola. The principal entrance in the middle of the Station-parade front is lacking in importance, and the vertical lines of this front are rather too pronounced. The Victoria-avenue front is treated in two parts, the library being plainer and lower. The municipal portion from the tower to the library has a slightly projecting bay at each end, with pediment, and five wide bays between with coupled columns on stilted pedestals. Semicircular arches spring from the sill level of the first floor windows at about half the height of the columns. The library is quaintly treated, with good effect. The Raglan-street front is a little less ornate than the others, but has single columns instead of coupled. The police-court and caretaker's house are lower than the municipal portion, the house having a range of six circular windows, the external effect of which is more satisfactory than the internal.

Messrs. Heazell & Son, of Nottingham, have gained the third premium of 75*l.* The location of the ground-floor rooms in the municipal offices corresponds very closely with that adopted by Mr. Hare, but the plan is less compact, the whole of the first floor, with the exception of three areas, being occupied. Only about half the site is utilised in the basement. With the exception of a store-room, the library department is entirely on the first floor. The witnesses' room is not in a convenient position, and there is no room for prisoners. The Victoria-avenue front is dignified and effective. It has a central feature of three bays, with coupled columns and pilasters, and an angular pediment over the central and wider bay. On each side of the central feature are six bays, divided by pilasters, and having wide arched windows on the ground story and two-light windows above. The entablature is surmounted by an open balustrade. The extreme projecting bays on this front have coupled columns and segmental pediments. The Raglan-street front is equally ornate, but not symmetrical, and the skyline is spoilt by the lofty roof of the first-floor reading-room at the west end—a defect which might easily have been avoided. The elevation to Station-parade has a central tetrastyle quasi-portico, with pediment, and a surbased dome above. This design shows an expensive building, and the authors have been somewhat fortunate in securing the third place.

It is impossible to refer to all the other designs, in number about seventy-five; a few are deplorable examples of planning and of external treatment; a few also show cleverness and power in architectural design, combined with a sad lack of knowledge in plan; more have fairly good plans with commonplace elevations; many are clearly too costly; and there really are probably not more than a dozen of sufficient merit to have given the assessor much trouble in arriving at his decision. Among the most notable designs is No. 39, by Messrs. Russell & Mallows, of London. This is good both in plan and elevation, and must have run the premiated designs very closely. The planning of the council chamber and the five rooms appertaining thereto is, in our opinion, better than in any other design; the internal effects would be excellent. It may perhaps have been regarded as a defect that this portion of the ground floor is raised about 6 ft. above the other parts, necessitating a similar rise in the first floor; but the authors have made good use of the difference in level by placing the basement rooms under this part of the building, and by treating it in a happy manner as the central block in the frontage to Victoria-avenue. The tower is also well designed. The draughtsmanship displayed in the elevations can only be designated by the word "coarse."

Messrs. Lanchester, Stewart, & Rickards, of London, also submit a design (No. 8) which has many good points, but which is marred by defects which have evidently been noted by the assessor, such as the faulty positions of the Town Clerk's office and the Magistrates' Clerk's room. The general scheme of the planning is, however, happily conceived for internal effect. The principal entrance is in the middle of the Station-parade front, and leads through a square vestibule (having quadrant corners, converting it almost into an octagon) to a flight of eight steps which rise to the level of the entrance-hall. Two flights of stairs, one on each side of the entrance flight, lead up to the first floor. The main corridor, or "councillors' ante-hall," is placed along the longitudinal axis of the building, with the council chamber to the left in the middle of the Victoria-avenue frontage, and with a committee-room on each side of the chamber. This arrangement would have a good internal effect, and has led to a happy treatment externally. The walls to the right and left of the council chamber are set back, and open colonnades of five bays each are placed in front, forming narrow terraces for the use of councillors. Beyond the colonnades are slightly projecting bays with lofty cupolas. The extreme portions of this elevation, and also the other elevations, are marred by the architrave and frieze of the main entablature being broken to receive the architraves and cornices of the windows. The general treatment is severe

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and somewhat forbidding, and the details are not very satisfactory.

Messrs. Hikins & Strong, of Liverpool (No. 64), also place the "grand corridor" on the longitudinal axis, leading direct from the principal entrance in Station-parade to the council chamber in the middle of the block. The plan is good, and the external treatment well conceived, but the design would be costly.

Messrs. Smith & Aspinall, of Blackburn, submit a design (No. 61) marked by good draughtsmanship. The main lines of the plan are well considered, but the police-court department is too elaborate, and the arrangement on two stories with two narrow flights of stairs would be very inconvenient. The "General Stationer's store" in the basement appears to have been an afterthought, and the draughtsman has apparently forgotten to provide an entrance to it.

Mr. S. D. Adshead, of London, provides a design (No. 75) of considerable merit and originality. The east and west portions are only one story high, and the central mass is two-storied with an additional attic story for the caretaker's house in the middle of the Victoria-avenue front. This arrangement has been very happily treated externally on symmetrical lines. The tower rises from the middle of the one-storied part at the east end. The police-court is placed on the first floor—not a good position—and the stairs to it are not well managed.

Design No. 78, by Messrs. Hall, Cooper, & Davis, of London, is good both in plan and elevation, but the narrowness of the corridors is a serious defect; for the greater part they are only 5 ft. 6 in. wide, and between the pilasters only 4 ft. 9 in.

As an example of grandiose treatment we may mention the design of Mr. E. E. Fetch, of London (No. 47). It is a monumental design, with a palatial staircase in the centre of the block. The elevations are on a similar scale, the two side elevations being almost exactly alike. From a purely architectural point of view the design is able and interesting, but it is much too costly, and the plan is seriously defective—thus, the main staircase forms the approach to the library and reading-room, as well as to the council chamber and other rooms, and the reading-room is separated from the lending library by a committee-room, ante-room, ladies' retiring-room, and service stairs, all these rooms being entered from the same corridor.

Among the other designs which are worthy of notice are those by Mr. H. A. Cheers, of Twickenham (No. 1), easily recognised by the characteristtc style and neat draughtsmanship; Mr. T. E. Marshall, of Harrogate (No. 12), with very original elevations, cleverly conceived and well drawn; Mr. T. A. Pole, London (No. 72), a well-drawn set, with highly meritorious elevations, but costly; Mr. W. West Neve, London (No. 43), good on the whole, both in plan and elevation, with pleasing detail, but with waste space in corridors and over-elaborate staircase; Mr. A. E. Dixon, of Harrogate (No. 7), whose arrangement of the municipal offices is in many respects remarkably similar to that adopted by Mr. Hare, but the staircase is unnecessarily elaborate; Messrs. Armstrong & Wright, of Newcastle-on-Tyne (No. 35), with a corridor forming a complete circuit on the ground floor, and enclosing the police-court, council chamber and two areas, and with an effective deeply-recessed entrance in the middle of the Station-parade front; Mr. W. Hargreaves Bourne, Darlington (No. 33), with an original plan with circular hall in the centre of the block and entrances in the side frontages on opposite sides of the hall, in addition to the principal entrance in Station-parade; Mr. H. A. Matear, Liverpool (No. 18), a good workable design of considerable merit and not too costly; Mr. Hilton Nash, London (No. 45); Messrs. Butler, Wilson, & Oglesby, Leeds (No. 55); Messrs. Mitchell & Raine, London (No. 23); Messrs. Moorhouse & Gilling, Formby (No. 48); Mr. W. N. McKinley, Norbury, S.W., with satisfactory elevations and fairly good plan and not over-costly. We also noted other designs of perhaps equal merit to some of those mentioned above, but not equal to the premiated designs.

It is, perhaps, as well to state that we have not attempted to place these designs in order of merit, and as our excuse for not adopting the numerical order, we may state that this was not observed in the exhibition of the designs; the only attempt at order consisted in placing the three premiated designs on the same screen. The reports were not exhibited, and we are therefore unable to give the authors' estimates, but there can be little doubt that the first premiated design is one of the most economical submitted.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held at 9, Conduit-street, on Monday evening, the President, Mr. W. Emerson, being in the chair.

The minutes of the last meeting were confirmed.

Address to the King.

The Secretary read the following address, which the Council had drawn up for presentation to the King:—"The dutiful and loyal address of the Royal Institute of British Architects to his most excellent Majesty the King. May it please your Majesty, we, your dutiful subjects the President and Council, on behalf of the Royal Institute of British Architects and of the architectural societies both in the British Islands and in British dominions beyond the seas in alliance therewith, of which Royal Institute your Majesty is the gracious and generous patron, beg leave humbly and respectfully to approach your Majesty with the expression of our loyal congratulations on the occasion of your Majesty's coronation, to tender our most devoted and dutiful homage. We earnestly pray that Almighty God will grant your Majesty a long, peaceful and glorious reign over this mighty Empire, wherein the arts may flourish, science extend her dominions, and the blessings of civilisation be showered upon a loving and loyal people." The address was signed by the President, Mr. W. Emerson; Mr. Alex. Graham, hon. secretary, Mr. Thomas E. Collcutt, and Mr. Edward W. Mountford (members of the Council), and Mr. W. J. Locke, the Secretary.

Presentation of the Gold Medal.

The President said he had now to perform quite the most pleasing duty that fell to the lot of the President of the Royal Institute of British Architects to perform, viz., to present to a distinguished colleague and member of the profession and of the Institute the King's Gold Medal. The medal was the greatest honour the Institute had in its power to recommend on those who had distinguished themselves by their work, or in furthering the art of architecture. The first to whom it was given was Cockerell, in the year 1848, and the last was the Commendatore Lanciani, the year before last. In 1901, owing to the death of our late beloved and lamented Queen, it was not awarded at all. Since then his Majesty the King had, as they all knew, graciously signified his intention to continue its presentation. Amongst the list of those who had received the medal were a large number of their most distinguished brethren, and also a number of eminent foreigners, for that Institute was not narrow-minded, but was cosmopolitan in its views. Amongst the recipients were the names of Cockerell, Barry, Donaldson, Smirke, Scott, Viollet-Le-Duc, Pennethorne, Wyatt, Street, Pearson, Penrose, Garnier, Hunt, Leighton, Aitchison, Bodley, and Professor Lanciani, and he fancied they would think Collcutt a fitting addition. The presentation of that medal conveyed the recognition that the recipient's life in the cause of their noble art had not been passed in vain, and that the profession appreciated the services he had rendered in the advancement of the art of architecture, and that the King ratified and endorsed the view taken of the work he had produced. In the architecture of the moment there was much to make them hopeful, and that the medal should be presented to Mr. Collcutt was an indication that the feeling in regard to architecture just now was distinctly against a slavish reproduction in our modern work of old examples, and also equally against the foolish ignoring of all precedent as a means of arriving at original productions. Mr. Collcutt had evidently carefully studied and reflected on the best examples of Classic, Gothic, and Renaissance work, and had thus marked out a distinctive line or path for himself. That was evident in such works as the Wakefield Town Hall, the Imperial Institute, and the City Bank in Ludgate-hill. He reiterated that the freedom from the mere trammels of precedent, coupled with study of precedent, was the most hopeful sign for the advance of architecture in this country. It was well that his gracious Majesty should confer the honour of the gold medal on their distinguished *confrère*, Mr. Thomas Collcutt, for in so doing the cause of their art was, he thought, greatly helped forward. Though they all knew Mr. Collcutt's work, the following was a list of some of his most important productions, and the order in which they were carried out. Commencing in 1872 with the Blackburn Free Library, and in following years the Wakefield Town Hall, the Imperial Institute, the P. & O. offices in Leadenhall-street, the City Bank, Ludgate-hill, the Bechstein premises and hall, Lloyd's Registry of Shipping, besides the decoration of many of the saloons of the P. & O. steamers, and a number of country houses and business premises. In all those works there was a most distinctive character and artistic feeling, combined with much originality of treatment, and without any evidence of straining after such originality, and affectation was entirely absent from all his work. He had the distinguished honour of handing to Mr. Collcutt the King's Gold Medal for Architecture, and he heartily congratulated him on the honour conferred upon him, and most heartily wished him further success and a long life and health to enable him to continue his work in the future.

Mr. Collcutt, in acknowledging the presentation, said he begged to thank the President most heartily for the kind terms in which he had spoken of him and his work, and to express to the members of the Institute his heartfelt appreciation of their goodwill towards him in suggesting his name to his Majesty the King for the honour of being Royal Gold Medallist for this year. The Gold Medal was founded for the promotion of architecture, and although he could not lay claim to having aided that desirable object, he could yet be proud of being a member of that Institute, which, in his opinion, had undoubtedly done very much for the promotion and encouragement of their art. He thought the Institute more than any other body had been instrumental in encouraging a diligent study of architecture; it had aimed at fostering a high ideal in the minds of their students by assisting them to a knowledge and appreciation of the best examples of ancient architecture. It was satisfactory to observe that students had been eager to profit by the advantages offered to them in the form of annual prizes, medals, and studentships. The drawings and sketches submitted in competition for these prizes were marvels of patient, diligent, and artistic study—study ranging from the purest classic to the mediæval, and almost to the Victorian age. In his opinion, this work and study was laying the foundation of a wide knowledge that would enable him to deal with his real work in a scholarly, Catholic and artistic manner, and also to meet the demands of modern requirements in the spirit in which the great masters designed and built. The Institute had also promoted the advancement of architecture by the encouragement it give to the study of the art of building as well as to the fine art of architecture. Their examinations dealt very largely with the various details of construction, and with the many mechanical trades that went to the forming of a building, and no student could be fully equipped for his future work in life unless he was a builder as well as a designer of architecture. In this way he thought the Institute had done more for the promotion of architecture than it would have been possible for individuals to do, however distinguished they may have been. While thanking them for the honour they had done him, he wished to add that the natural and he thought excusable feeling of elation with which he learned that the King had graciously sanctioned their recommendation was not untempered by sadder thoughts. He alluded to the most sincere regret and sorrow felt by them all that one whom they unanimously wished to honour was suddenly taken from amongst them before the distinction they intended could be conferred upon him, and, alas! before his great work was finished. Only a few weeks before the death of Mr. Bentley he had the privilege, together with other friends, of being conducted by him over his magnificent cathedral. That work, so far as the interior was concerned, was left unfinished, not much more than a shell, but a very noble shell. Both architects and the public had sustained an irreparable loss. They would not now see the outcome of the definite

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co-operation of the architect and painter mosaicist—a co-operation which justified them in expecting the most noble results, because, though rarely seen, it was founded upon a true principle. Let them fervently hope that whatever decoration of the domes might be decided upon it would be entrusted only to those who had a knowledge and feeling and enthusiasm for the architecture of the building, and also might they hope that sufficient funds might be forthcoming to complete this great architectural monument in a manner worthy of the genius of him who designed it. He was deeply grateful for the honour done him in placing him on the roll of the gold medallists. There might be many more deserving of the honour than he, but there was not one who had more earnestly wished to further the cause of their art.

The President said that, after many years of intimate relationship with the active work of that great Institute, he had that evening, in a way, to say good-bye to them and to his valued friends and colleagues on the Council, for after leaving that chair they all knew their Presidents ceased from active work in connexion with their affairs. In now vacating the honourable position by placing him in which they so kindly gave expression to their confidence in him during the last three years, he could only assure them how deeply he had appreciated that confidence and honour they reposed in him by entrusting the guidance of the Royal Institute of British Architects to his hands and head. If in any degree or measure he had failed to give them satisfaction or disappointed their expectations he prayed them to forgive him. If, on the other hand, they should think that in any measure he had added —as he had ever endeavoured to do—to the interests or influence of the Institute, all he could say was that he was truly thankful, for that had been his one and only aim, and the feeling that had prompted all his efforts in acting in the capacity of their President. He had always felt that the Royal Institute of British Architects should be the real and only representative to-day of architecture for the whole of the British Empire, and it would fast become so if they were only true to themselves, strong, and not wanting in *esprit de corps;* and if they let one voice be heard on all important matters relating to their art and their profession, with no wavering or uncertain sound, before many years have passed the Institute should hold quite the influential position it ought to do, and there should be scarcely any men worth calling members of their profession who would care to stand aloof. As it was, he thought it must be somewhat of a selfish feeling which could prevent men of standing in a profession refraining from assisting their brethren by not adding their influence and power to the representative body of that profession and declining to join it or assist in upholding the common interests and strengthening the position of those following their own calling. With divided ambitions and counsels, the profession would be weak, and would be dictated to instead of dictating. With unity they would have influence and real strength, and should be less subjected to the humiliating circumstances they occasionally had to deplore in the dealings of employers—public bodies or private individuals—with the architectural profession. Above all things, they need not let their selfish interests sometimes cause doubtful lines of conduct to be entered upon, which had, he feared, been the case occasionally, even amongst those who had been loud in their condemnation of unprofessional conduct in others. Let them, above all things, be honourable gentlemen, straightforward, firmly joining together in leading their great Institute to a position of respected influence that could not be gainsaid. And now he wished them all farewell, and to his colleagues he could only say that when he first became a member of the Council some sixteen years ago he hardly knew any of the members; now he felt that he was leaving so many friends for whom he had learned to feel the greatest regard and respect, and, indeed, he trusted the feeling was reciprocal. They could understand, therefore, if he said he felt a little sad that night, notwithstanding that he was laying aside a great burden of responsibility, which had sometimes weighed heavily upon him. He thanked them all for their wise counsel and kindly help, and the loyal and constant care with which they had always aided him during his term of office. Mr Aston Webb had now to take over the badge and chain of office as their future President, and he was perfectly certain that the Royal Institute of British Architects would give forth no uncertain sound, nor diminish in numbers, influence, and prestige under his guidance.

Mr. F. C. Penrose said he wished the duty he had to perform had been entrusted to some other person, but ill as he might acquit himself his subject would have their agreement. It was to offer their thanks to the President for his actions as President during the past three years. The strong and well-considered rulings of the President on several occasions, he believed, had been greatly for the benefit of the Institute, and if followed by his successor would lead to satisfactory working. They thanked him most heartily for what he had done.

Mr. Ernest George, in seconding the motion, said the President had used his energy for the Institute, and always in the most kind and courteous manner, and he would go out of office with the greatest regard.

The motion having been carried, the President briefly returned thanks.

The President having announced that the next meeting would be held on the first Monday in November, the proceedings terminated.

The annual dinner of the Royal Institute of British Architects was held on Thursday the 19th inst., at the Hotel Metropole Mr. W. Emerson (the President) took the chair, and among those present were Mr. J. Macvicar Anderson (Past-President); Lord Balcarres, M.P.; Mr. John Belcher, A.R.A. (Vice-President); Colonel Stanley Bird; Sir George Birdwood; Mr. Hippolyte J. Blanc, R.S.A.; Mr. Thomas Blashill; Mr. G. F. Bodley, R.A.; Mr. W. D. Caröe; Mr. C. Purdon Clarke; Mr. J. R. Clayton; Mr. T. E. Collcutt (Vice-President, Royal Gold Medallist Elect); Sir Martin Conway; Mr. Alfred Darbyshire (Vice-President); Mr. W. M. Fawcett; Mr. George Frampton, R.A.; Mr. Ernest George; Mr. G. L. Gomme; Mr. Alexander Graham (Hon. Secretary); Mr. G. E. Grayson; Mr. E. J. Gregory, R.A.; Mr. E. A. Gruning; Mr. Edwin T. Hall; Mr. Henry T. Hare; Mr. Charles Heathcote; Lieut.-Col. Sir Albert Hime; Mr. G. T. Hine; Sir Henry Howorth; The Earl of Iddesleigh; Mr. B. Ingelow; Mr. W. J. Locke (Secretary); Sir Norman Lockyer; Dr. Longstaff; General Moncrieff; Lord Monkswell; Mr. E. W. Mountford; Dr. A. S. Murray; Sir Walter Peace; Professor Beresford Pite; Mr. Rowland Plumbe; Mr. A. N. Prentice; Lieut.-Col. Probyn; Mr. G. H. Fellowes Prynne; Sir W. B. Richmond, R.A.; Mr. T. M. Rickman; Mr. W. E. Riley; Mr. E. R. Robson; Mr. H. D. Searles-Wood; Sir Walter Sendall; Archdeacon Sinclair; Mr. John Slater (Vice-President); Professor Elsey Smith; Professor T. Roger Smith; Mr. H. Saxon Snell; Mr. A. W. Soames, M.P.; Mr. Lewis Solomon; Sir Benjamin Stone; Sir John Taylor; Mr. Thomas H. Watson; Mr. Aston Webb, A.R.A. (President-Elect); Mr. J. T. Wimperis; Sir H. Trueman Wood; Mr. R. Selden Wornum—and many others.

In announcing the inability of Lord Wemyss, Mr. Fletcher Moulton, M.P., Sir W. S. Church, Sir H. Tozer, Sir L. Alma-Tadema, and other gentlemen to be present, the President remarked that in former times the President of the Royal Academy used to attend the dinners, and especially the late Lord Leighton, who used to bring all the influence he could on the society to influence the great art of architecture.

The President, in submitting the health of the King, said his Majesty had always been patron of the Institute, and his illustrious father took the greatest interest in the founding of it and helped to set it on a firm basis on its initiation. The King also presented annually a gold medal on their recommendation to some person who had distinguished himself by his works in the furtherance of the art of architecture.

The toast was received with great enthusiasm as was that also of "Queen Alexandra, the Prince and Princess of Wales, and the other members of the Royal Family," submitted by the President.

Mr. Macvicar Anderson said that on the last occasion he had the privilege of speaking in the room he had to propose the toast of "Church and State"—a somewhat alarming subject for an after dinner speech. He disposed of the subject in a very few words, but the Archbishop of Canterbury, who was coupled with the toast, did otherwise The Archbishop delivered a very long, most able, and vigorous speech, but a speech which was distinguished above everything else by the circumstance that it made not the faintest allusion to the subject of Church and State. He had been asked that night to propose the toast of the Houses of Parliament, and said it was impossible to refer to a political subject without talking politics; he proposed to take a leaf out of the Rev. Archbishop's book and leave to their imagination the many happy, beautiful, and graceful allusions he might make to the Houses of Parliament. One remark only would he venture to make. At a time when they were emerging from a great war, when their brave army and brave enemy were apparently embracing each other, and when the leaders of the Boers, and their own splendid General, Lord Kitchener, were expressing sentiments alike honourable to both, it would be strange indeed if they did not feel grateful to the Houses of Parliament for the part they had taken in bringing about so happy and so auspicious a result. He would, without further words, submit the toast of "The Houses of Parliament," coupled with the name of Lord Monkswell, the Vice-Chairman of the London County Council.

Lord Monkswell said the proposer had left a great deal to the imagination, and he was not sure that he would be equal to the occasion. He was in a difficult position, because there was no one present to reply for the House of Commons, and he was not able, therefore, to give rein to his feelings, and explain to his audience the vast superiority of the House of Lords over the House of Commons. It was a little hard that a member of the House of Lords should be asked to make a speech so near to the Coronation, because they were all thinking of their seats in Westminster Abbey, and there were matters of great importance on which their attention was occupied. One of those was as to how they were to put on their Coronets. The general opinion was that they should put them on straight across their foreheads, but he was told there was a great and influential section amongst the younger peers who thought the Coronets should be put on after the fashion of forage caps. It sometimes occurred to him that a visit to the House of Lords might do a great deal of good from a point of view which had probably not occurred to many people—he meant as a lesson of the vanity of human wishes. The members of the House of Lords were highly placed, and most of them were rich, but if they went to the House to hear a debate they saw a number of elderly gentlemen sitting on red benches apparently in the depths of gloom and despondency, like martyrs trying to die with becoming Christian fortitude. A distinguished characteristic of the House of Lords was the extreme decorum of its debates, but there were a class of persons who found themselves in the House of Lords somewhat late in life, who did not at first understand the atmosphere—he alluded to the bench of bishops. When a bishop first came into the House he was accustomed to the rough and tumble fighting in Convocation where they debated questions, he believed, with a good deal of heat. There was a story told of Bishop Stubbs. The first time he came to the House Lord Herschell was speaking and said something which dissatisfied the Bishop, who said quite loudly, "Oh, oh." "For Heaven's sake don't do that," whispered his neighbour, "Herschell might suppose you were listening to him." He thought he need say no more in praise of the House of Lords.

Mr. Aston Webb, A.R.A., said the toast he had to propose was the Colonies, but he might more properly propose "His Majesty's British Dominions Beyond the Seas." It was a subject which had been treated by all the greatest men of the day, and it would be presumptuous on his part to attempt to deal with it there, but they as architects and their brother artists that night were Englishmen before anything else, and they would wish him to express in their name to the distinguished representatives of the British Dominions who were present their delight in seeing them, and to say how proud they were at the closer union which was being drawn between the dear old country and the British Dominions so far beyond the seas. Perhaps the point which touched them most nearly was how far this union was going to affect the art of this country and the art of the world. He

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imagined it was going to affect it very much indeed. He supposed the great function of art had always been the expression of the ideas of a nation and a country. For centuries art had expressed the aspirations of victory; sometimes—not so often—of peace; almost always of religion. Now surely there was an opportunity for a new expression; a new aspiration which had come to them. Surely the art of the present day would be able to rise to that aspiration, and literature, painting, sculpture, and last, but not least, architecture, would be able in time to show some fresh development of their work which would owe its creation to this new aspiration of a United Empire. The new blood which they hoped to be brought to them from beyond the seas, restrained as it might be by tradition from the old country, might develop in time a style which would be understood all over the world as representing this wonderful empire without limitation of country, but limited only by the world itself. They were all honoured that night by the presence of Sir Albert Hine, the Premier of Natal; by Sir Walter Peace, the Agent-General for Natal; by the Hon. Alfred Dobson, the Agent-General for Tasmania; by the Hon. T. E. Fuller, the Agent-General for Cape Colony. Of all the Colonies that were present most in their thoughts was that one of Natal. It was the Colony which first stirred in the struggle which was now happily closed. In proposing that toast he ventured to couple with it the name of Sir Albert Hime, the Premier of Natal.

Sir Albert H. Hime, who met with a most enthusiastic reception, in rising to reply, thanked the company for the way in which they had received the toast, and also Mr. Webb for the way he proposed it. He would not say that the Colonies did not deserve the cordiality which had been exhibited by that distinguished assembly, but he would say that, so far as the little Colony of Natal was concerned, they had really done nothing more than they considered to have been their duty. They were proud to belong to the great British Empire; they were proud to have done what they could to maintain the integrity of that great Empire, and although they were but a small Colony, he hoped he might say they had done everything in their power to maintain that integrity they all so ardently desired. Natal was the last Colony to which self government had been granted by the King; but, although it was the last jewel in the crown of his Majesty, he did not think it was less brilliant on that account. Recent events had proved that the Colonies were factors which could not be excluded by those who were responsible for shaping the destinies of the Empire. The Colonies had shown the marvellous capabilities they possess; they had shown the extraordinary resources they had in all parts of his Majesty's dominions beyond the seas; and recent events had led, he believed, to a better understanding of the Colonies and of their aims and aspirations. They had passed through a very serious crisis, there had been a great expenditure of blood and treasure, but one thing would result from that expenditure, which was that the ties which unite the Colonies to the mother country had been cemented and made more secure than they had ever been in the past. They had now at the head of their Colonial affairs a statesman whom the colonists all admired, and in whom they had the utmost confidence. That statesman had shown himself to be mindful of the interests of the Colonies, and had taken every means to acquaint himself with the aims and the aspirations of the Colonies, and they firmly believed that he had done more towards uniting the Colonies to the mother country than any other statesman had ever done before. He had spoken of the marvellous resources of the Colonies. Many of them, perhaps, knew as well as he did what those resources were, but they were resources which he thought ere long would make the British Empire self-supporting. The previous day he paid a visit to the Alexandra Palace, and saw the Colonial troops reviewed by the Duke of Connaught, and he felt a thrill of pride run through him when he saw what magnificent material there was in those soldiers from beyond the seas for the future army of the Empire. They would probably all see those soldiers in a few days in the Coronation procession, and he thought they would all agree that in them they had material which it would be a serious thing to ignore in any respect whatever. So long as they had that material, and so long as as they had the Colonies united with the mother country, they need never be afraid to face their enemies in the gate. The war, which was now happily closed, had been referred to that evening, and he did sincerely trust that under the just and able government of that great statesman, Lord Milner, their recent brave foes would become their friends, and would ere long be proud to call themselves subjects of the greatest Empire in the world. The war was now happily ended, but if at any future time the British Government should be in need of assistance in any part of the world he ventured to hope—indeed, he asserted positively—the colonists would come forward and would be prepared to prove themselves, as he trusted they had proved themselves in the past, to be worthy citizens of that great Empire to which they were all so proud to belong.

Lord Balcarres said the toast he had the honour to place before them that evening was that of "The Royal Institute of British Architects and Allied Societies," and it was one which would readily commend itself to their notice. They were all familiar, of course, with the immense work carried on by the Institute; by its extended membership; by its affiliation with allied societies all through the country, and now happily extending to the remotest Colonies. They were familiar with the scholarly and learned transactions of the Society and with the valuable work it did in the examination of architects and surveyors, and so forth, all the while raising the dignity and status of the architect's calling. But it was not on those grounds so much that he submitted the toast that evening. He wished to do so rather as a layman, as a member of the public, as an unlearned person in the technicalities of architecture. But he thought a member of the public had clearly the right to propose the toast because, after all, the greatest patron of architecture to-day was the public. At one time the greatest patron was the Church; then it was the men who erected large mansions, but now the great patrons were the State and the municipalities. Think of the buildings which had to be erected now by the community—the barracks, the police-courts, the post-offices, and the great rehousing schemes, and the great opportunities they presented. As a member of the public and as one who took a share in being amongst the great patrons of architecture, he was glad to propose the toast. Just outside the window one of the greatest buildings which had ever been erected was being put up by that great patron of architecture, the public, and they found that the great rehousing scheme and the great reconstruction schemes of the Institute were being carried out by the public. Thus London changed, but the beauty of the future of London lay largely in the hands of the Institute of British Architects. The public had got to look to them for a "city beautiful," and eventually to achieve that ideal was what the public were, he believed, really hoping for. That was why the members of the public owed a great debt to the architect. But he would like to say, frankly tempered with all humility, what he conceived to be the duty of the architects to the public. The duty, certainly to his mind, did not end with the completion of the building, but the duty of the architects would not be ended until the public should have its mind cleared of certain fallacies to which it clung with great zest. Let him as one of the public turn king's evidence on some of these fallacies. Firstly, the public had not yet learned that architecture is a living organic art—that was why they thought architects could be scheduled and registered. The public view was, they might say, "Once a builder, always an artist." Now he asked as one of the public that the Institute should teach them that architecture did not consist entirely of plate glass and steel girders. Would the Institute teach them that the laws of architecture were not entirely comprised in the Building Acts? He would pass from that fallacy, which was a very dear one to the British public, to another one, which was even more subtle and in some ways even more dangerous—a fallacy which for convenience one might call the ideal of associated architecture. It meant that if they had a building to erect and chose a man, they did not trust him enough to do the work by himself, and therefore associated with him another architect whom they did not sufficiently trust before to give the work to. The public idea, of course, was that one man could make the exterior and another man could make a good interior from the same exterior. That was to say, they were entirely denied the essential unity and the essential harmony of the art of architecture. There were two features, and none of those present could deny that they were held very dearly. The public attention which was given to the correspondence which passed between the Institute and its allied societies a few months ago, when they made representations to a high member of the public, was, he thought, sufficiently responsive to show that anything which came from the duly accredited representatives of the great art of architecture would be respectfully received by the public. The letter which he read in that morning's papers, coming officially from the heads of that great Institute, they would find would be received with deep respect, and he hoped care would be given to the representations which the President had made. He did not ask—far from it—that the Institute should take up an aggressive line, for they could leave that to the House of Commons, but he did say with perfect sincerity that the public was willing to learn, and that the public was a willing listener, especially when it knew that those who offered advice were duly qualified to give that advice. He proposed the toast of the Institute, coupled with the name of the President.

The President, in reply, said he had to thank the company very much for the exceedingly hearty way in which they received the toast of the Royal Institute of British Architects and its allied societies, and also for the manner in which they had received his own name. Since he had the honour of taking the chair for the first time at those annual dinners three years ago great historical events had happened. They had witnessed during that short period the death of the century—a century perhaps the most remarkable the world had ever seen for its progress in all branches of knowledge and science. To such a great extent had science advanced during that century that it had practically changed the circle of the globe by bringing distant countries and continents politically and socially in close proximity to each other—in fact, distance had been discounted. They had also had to regret the passing of the greatest and best-beloved Queen that this country ever had. They had also in a few days to record the Coronation of King Edward VII., and the country was also recording the successful completion of the most difficult campaign that it had ever had to carry on. A war that was waged 7,000 miles away had ended in a peace which they hoped might be lasting, and had added an enormous addition to his Majesty's already vast dominions and to give them a new people to add strength and stability to the British Empire. Also they had to record the great fact of Colonial federation, of which the results in future would probably be greater than any man could foretell. Further they had witnessed the birth of the new century, and in this country it seemed that, for all appearances progress, in knowledge and science would not diminish. Now these historical events of the past few years ought certainly to have a great effect in the art of architecture. They believed that their art during this century would advance, and that it would show as fine buildings as those which had been produced in any former age, and they looked forward to this for two reasons. One thing was the widened interest that was taken in the education of the architect, and the second the increase of interest the general public took in the art of architecture and its sister arts, sculpture and painting. The noble lord had spoken of the duty of architects to the public. Well, they had often spoken of them in their Institute, and they had considered that the best way to educate the public in architecture was to educate architects themselves. For this reason these examinations were instituted some years ago, and they had a greater number of students coming year by year. They had also started those examinations through the allied societies in the Colonies. In Canada and Australia these examinations had been commenced by accredited members of the Institute in those parts, and the examination papers were sent home and sent out. That was a step in the right direction, but what they wanted was that the status of the srchitect should be more clearly defined, and to this end it would be a good thing if Parliament were able to pass some measure by which their towns and country should be pre-

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vented from being disfigured by the work of builders without guidance, or by men who had absolutely no justification for practising as architects. How such a measure should be framed was naturally a large question, which they could not enter into there. It would be a matter of some years to come, no doubt. But it was important that the buildings of a great Empire like this should be magnificent, to tell the history of the country. He alluded purposely to the historical events which had taken place in the last three years with a view to pointing out that the Government at the moment were engaged in erecting a large and important building. So was the London County Council. Surely such events as the solemn cortège at the burial of their great Queen and the incidents of the event which they had just completed ought to be told on the walls of their public buildings even if 20,000*l.*, or 30,000*l.*, or 50,000*l.*, or even 100,000*l.* were spent in sculpture or painting. It would be a trifle in comparison with the cost of these enormous buildings now being erected. They sincerely hoped that Parliament would see its way to allow an expenditure which would be adequate for such a purpose and should be sufficient to show forth the history of the last few years to future generations. He thought the suggestion that these subjects might be represented on the buildings was not an impossible suggestion, for in the late war the peoples engaged were picturesque. The costumes were picturesque and avoided the difficulties to the sculptor which most of the uniforms of past years gave in attempting to deal with them artistically. There was another factor in the architecture of the next few years of this century that might possibly have a great influence on their art works, and that was the attitude taken up by the London County Council with reference to buildings in that great metropolis. The Report on the construction of the Holborn street scheme had now been issued, and it was sincerely to be desired that having taken so much trouble to get harmonious design of this scheme, a masterful hand should be held over every tenant taking plots of building in order that the general harmony should be kept throughout the whole scheme. It was also to be hoped that no new-fangled notions of construction or design should be allowed to pass the London County Council of these new buildings suggested by the speculative energy emanating from the other side of the Atlantic. It was also to be hoped that in such an enormous frontage as was proposed for the new Victoria terminus the London County Council would keep an eye on the design and see that really a handsome architectural feature was made of that frontage, because these railway stations were now assuming such a vast size that it was imperative they should not be eyesores to this great Metropolis. In a short time his duties as President of that Institute would end, and greatly as he had valued the assistance and loyal aid in his duties, and heartily as he thanked confrères for that loyal support, yet he would hand over with pleasure to his successor, Mr. Aston Webb, the guidance of the affairs of the Institute, feeling perfectly sure that the prestige and influence of the Institute would not diminish under his guidance.

Mr. J. Belcher, A.R.A., said the presence of so many distinguished guests had been one of the greatest charms of the gathering. They most heartily welcomed them, and they particularly welcomed the distinguished representatives of the Colonies. The architects were seeking to gather together into closer communion their fellow workers everywhere. They were anxious that architecture as a fine art should more and more adequately express the feelings of the great Empire. He proposed the toast of "The Guests."

The Earl of Iddesleigh briefly replied, and thanked the Institute on behalf of the guests for a pleasant evening, which he thought they would not soon forget. To their President he would add one special word of thanks. He believed that a great deal of the President's work had been done in India, and under those sunny skies he had added to what already existed a market, a palace, and a cathedral. They could congratulate themselves, however, that in future the President intended to devote himself to their dear old smoky London.

DUNKIRK BRICKS.—Mr. Taylor, British Consul at Dunkirk, reports that bricks, which were rather largely shipped from that port to England in 1898-1900, are no longer exported.

ARCHITECTURE AT THE ROYAL ACADEMY.—III.

CONTINUING our notes on the domestic work amongst the exhibits, we come to

No. 1,441. "House at Welwyn, Herts," by Mr. R. A. Briggs, in which a masterly plan is united with an unaffected, simply treated exterior in red brick and tile, which, with the formal garden indicated, would make an eminently liveable house.

No. 1,442. "A House at Hampstead," by Mr. Arthur Keen, is the exact antithesis of the last, having a wastefully involved plan, with a fussy, restless exterior. The main point of the plan is a studio, the approach to which, through a series of odd-shaped halls, is marred by the bad arrangement of the service between the kitchen and dining-room.

No. 1,444. "Aldershot Vicarage," by Mr. Charles Spooner, is a quiet and picturesque exterior, with a plan possessing good points, but not quite perfect in its treatment of aspect.

No. 1,445. "Sunny Bank, Great Marlow, Bucks," by Mr. W. Henry White, is a cleverly-treated version of eighteenth-century English work, with accessories that depart from the symmetry of the house, and is pre-eminently a summer residence; in fact, a house outside of which one would prefer to live to enjoy the boathouse with terrace over, the formal garden, and summer-house.

No. 1,449. "Stables, the Coppice, Henley," by Mr. Walter Cave, stamps the owner as a horsey man, and is rather too effectively stable-like in its character.

No. 1,450. "Welbeck Abbey, New Dining-room," by Messrs. Ernest George & Yates, we have noted in a previous article.

No. 1,451. "Fountains Abbey Hotel, Ripon," by Messrs. Bedford and Kitson, is a small coloured elevation, showing a building with two stories rough cast and a half-timber story above, which, with the verandah below, produce a suitable and pleasing design.

No. 1,453. "A Doctor's House, Windermere," by Mr. Robert Walker, is a nice little drawing without plan, and the design quite of an ordinary character.

No. 1,454. "Small House at Enfield," by Mr. Alfred Hart, shows a corner only of a would-be picturesque house in which rough cast walls with red brick plinth and tiled roof are combined with very green wood work, producing an exterior whose laboured effort is not bettered by a plan that cannot be commended.

No. 1,456. "A Dining-room at the Boltons, Kensington," by Mr. Cole A. Adams, is a study in colour decoration in which a large frieze and dado reduce the wall to unhappily proportioned longitudinal strips, the "filling" of which would certainly be improved by greater extent. The colour effect would depend entirely upon the precise shade of the puce-coloured filling, which in the drawing does not seem to be exactly right.

No. 1,457. "House at Oxford," by Mr. Henry T. Hare, is a very able plan in which true economy and symmetry are skilfully combined, whilst the exterior is an admirable, rich, and imposing design.

No. 1,460. "House at West Green, Winchfield—Garden Front," by Mr. Ernest Newton, is a quiet and satisfactory piece of work in which the value of a plain wall surface is capably emphasised.

No. 1,461. "The Saracen's Lair, Mayford," by Mr. W. F. Unsworth, we have already noticed for its striking picturesqueness.

No. 1,463. "House at Bromborough, Cheshire, Entrance Front," by Mr. John J. Talbot, belongs to the class of design stamped with safe mediocrity, but not likely to awake enthusiasm.

No. 1,465. "A Country House and Formal Garden," by Mr. H. Inigo Triggs, is a design, principally of a formal garden, chiefly remarkable for the delicacy of its draughtsmanship.

No. 1,466. "No. 13, Charles St., Mayfair," by Mr. R. G. Hammond, looks like an attempt to put as much as possible into a narrow front, and to produce a building of sufficient cost to bear a due proportion to that of the site; more restraint and a greater knowledge of detail would have produced a better result.

No. 1,468. "The Piazza and the Porch of Cowley Manor, Gloucestershire," by Mr. R. A. Briggs, are costly adjuncts of high-class Italian Renaissance character to apparently a large mansion.

No. 1,469. "Garden Front, Castle Dyke," by Mr. J. B. Mitchell Withers, is a big house in which the collection of stone walls, gables, and mullioned windows just misses being a fine composition.

No. 1,471. "Hall of House at Hampstead," by Mr. Arthur H. Moore, is a clever interior in which a pleasurable effect is produced by a fusion of "new art" and Jacobean detail.

No. 1,473. "Design for a Pair of Small Country Houses," by Mr. Frederick W. Ravenscroft, follows, but not slavishly, the "new art" apostles, and should rather be described as a design for well-planned semi-detached, double-fronted, suburban villas.

No. 1,474. "Garden, Pavilion, and Stables, South Hill Wood, Bromley," by Mr. Evelyn A. Hellicar, is a design for a luxurious accessory, neither picturesque nor symmetrical with detail neither original nor aptly composed.

No. 1,480. "Design for a Country House," by Mr. James W. Cobb, is an illustration of a good old-world idea, of seventeenth century cachet, in rough cast and half timber.

No. 1,483. "The Willows, Northwood," by Mr. Arnold Mitchell, is a study in big cornice, bays, and modelled plaster for the garden front of a house that is suggestively grand on one side, but shabby on the other.

No. 1,485. "Design for a London Terrace House," by Mr. Frederick E. Ravenscroft, is free from vulgarity, and therefore superior to the ordinary product of the speculating builder.

No. 1,486. "House in Northmoor-road, Oxford," by Mr. Edward W. Allfrey, is one of those drawings that suggest reflections on the judgment of the hanging authorities. Why it was hung, we cannot say.

No. 1,488. "A Country House and Garden," by Mr. H. Inigo Triggs, is a charming drawing, chiefly of a garden.

Nos. 1,489, 1,490, and 1,492. Three of Mr. Belcher's drawings we noted in our first article.

No. 1,497. "Nursery Wing, Hopedene, Surrey," by Mr. Percy N. Ginham. The highest praise that can be given to this design is that the author has successfully maintained the character of the original well-known house.

No. 1,498. "A House on the South Coast," by Mr. Henry A. Tinker, might be anywhere else, being an instance of fair mediocre modern design, whose chief point for notice is the peculiar draughtsmanship in varying tones of flat Indian ink wash.

Nos. 1,500 and 1,501, by Mr. Reginald Blomfield, we have already noticed.

No. 1,503. "Westhope Manor, Shropshire: Garden Front," by Mr. E. Guy Dawber, is a fine composition of plastered walls and tiled roofs. Of course, this drawing could not be hung next to No. 1,366, another view of the same house.

No. 1,504. "A House on the South Coast," by Mr. Henry A. Tinker, is like the same author's other example, inexpressive of its location, with for its chief feature a big roof.

No. 1,506. "House on the Ridgeway, Enfield," by Mr. Alfred H. Hart, is the best of this gentleman's designs exhibited, both in plan and in its external treatment of a plaster and red tile house.

No. 1,507. "Phillimore House, Dean's-yard, Westminster," by Mr. George A. Hall, is a hopeless jumble of unhappily proportioned features.

No. 1,508. "Maurice Hostel, Hoxton," by Mr. Paul Waterhouse, is an artistic little coloured drawing of a design that shows a clever use of simple materials.

No. 1,509. "A Summer-house," by Mr. J. Coates Carter, is an equally good drawing, but in pen and ink, of a similarly clever use of simple materials.

No. 1,510. "Hill End, Wendover," by Mr. Leonard Stokes, has already received comment in our first article.

No. 1,514. "House at Hampstead," by Mr. William F. Harber, is too clever both in drawing and design.

No. 1,516. "House at Skibbereen, Cork," by Mr. Robert S. Balfour, is a good design in rough-cast and green shutters, with red brick quoins and chimneys, and tile roofs.

No. 1,525. "Keeper's Lodge and Dairy," by Mr. George O. Scorer, is a sheet of plans and elevations to $\frac{1}{16}$-in. scale of a mediocre design.

No. 1,526. "Sketch for a Boat-house," by Mr. Lionel F. Crane, is a sensible design, that screams in colour with a vermilion roof.

No. 1,531. "Proposed Entrance-gate for Strangers' Corner, Farnham," by Mr. Harold Falkner, is a good but not remarkable little piece of detail.

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No. 1,533. "Entrance Porch, West Court, Maidenhead," by Mr. W. West Neve, is an example of the costly cottage style, with half timber and clever detail.

No. 1,535. "Additions at the Round Tower, Burnham," by Mr. Edgar S. Underwood, once more suggests the question why a drawing of a round tower and simple piece of half-timbering was hung.

No. 1,542. "Design for a Country House," by Mr. Arthur J. Penty. Another suggestion for a similar query.

No. 1,546. "House at Biddenham, Bedford," by Messrs. Mallows & Grocock. A plastered house picturesquely supported on bays and detached Doric columns, with a formal garden.

No. 1,547. "Three Town Houses," by Messrs. Hoare & Wheeler. A drawing of ¼-in. scale elevations, with smaller scale plans of unconventional but feeble designs.

No. 1,552. "Helnestowe, Abingdon," by Mr. Harry Redfern, is a combination of offices and residence, in which an irregular site on the water's edge has afforded an opportunity and excuse, rightly seized, for a rambling yet conveniently planned house of quaintly picturesque exterior.

No. 1,554. "Dining-room of a House at Scarborough," by Mr. Arthur J. Penty, is a grey toned coloured interior of the "new art" school.

No. 1,560. "Garden Front, Briar Dene, Cheshire," by Mr. R. Frank Atkinson, is good in a quiet way, but one rather tires of the insipidity of such designs, which represent the skim milk of modern design—not the cream that ought alone to fill the limited space on the walls of the Academy.

No. 1,561. "Moonhill, Cuckfield, Sussex," by Mr. T. H. Mawson (garden architect) and Mr. P. Morley Horder (architect). A picturesque house in plaster and half timber, with tile roof and a large and costly garden.

No. 1,562. "Hall Ingle, Heath End, Checkendon," by Mr. O. Maxwell Ayrton, "for, and decorated by, Arthur Hacker, Esq., A.R.A.," for whose work the architect's part is but a frame, though, withal a fitting and satisfactory frame.

No. 1,563. "House and Garden, Biddenham, Bedford," by Messrs. Mallows & Grocock. A severely-treated house, with a garden lacking any particular point of interest.

No. 1,564. "The Cypress Walk," by Mr. Paul Waterhouse. A cypress avenue, with fountain and box apses half-way, leading to a classic temple (or summer-house) in the far distance.

No. 1,565. "House and Studio, Hampstead," by Mr. William E. V. Crompton, has no plan and shows no studio, but would be a decent square house of eighteenth-century type if the roof were not so steep and the dormers so large and close together.

No. 1,566. "New Room, Great Tangley Manor," by Mr. George Jack, is a picturesque hall of quaint plan, with plaster vaulted ceiling.

No. 1,573. "House in Germany: Entrance Front," by Mr. M. H. Baillie Scott. The entrance is effective, arranged in a re-entering angle of a house with circular towers and conical roofs. A "new art" version of mediæval "motif." The drawing, a bird's-eye view, is funny, with its trees of cotton wool on sticks.

No. 1,574. "A Corner of Fitzgeorge-avenue," by Mr. Delissa Joseph. A decidedly picturesque corner, as shown in a clever drawing by Mr. D. Warry in the manner of a well-known master of pen and ink.

No. 1,577. "Dining-room to Mansion, Suffolk," by Mr. A. N. Prentice. An eighteenth-century interior, well carried out in detail of costly workmanship.

No. 1,580. "A House at Pinner," by Messrs. Harrison & Ward; and

No. 1,581. "A House at Warlingham," by the same gentlemen, are both able examples of the rough-cast and red tile type of house which appears to be the *dernier chic* in domestic work.

No. 1,589. "House in Germany: Dining-room," by Mr. M. H. Baillie Scott—presumably an interior of the house shown in No. 1,573—is a combination of German Romanesque and "new art" in red and green.

No. 1,592. "House at Brancaster, Norfolk," by Mr. George O. Scorer. An elevation, simple and quiet, of a rough-cast and tile house.

No. 1,593. "The Manor-house, Mount Grace Priory, Yorks," by Mr. Ambrose A. Poynter. Elevation and plan of additions to show how the character of the old work has been successfully kept.

ARCHÆOLOGICAL SOCIETIES.

SUFFOLK INSTITUTE OF ARCHÆOLOGY.—A large number of members of the Suffolk Institute of Archæology and Natural History recently inspected the moated, late fifteenth-century manor-house, Otley Hall, where Mr. Vincent B. Redstone gave some particulars concerning the history of the building, which proved to be full of features of antiquarian and historical interest. He said that a few years ago many of them would have passed the old hall by as an object of no great attraction. Now that the owner had dismantled the walls of the unsightly plaster which concealed their hidden beauty and design, and had carefully brought to light the early character of the old hall, not even a casual observer would deny that there was much in its picturesqueness which should be admired. The timber and pargeting added strength as well as character to walls such as the true builder would not refuse to give. The long colonnade, surmounted by the grape and vine leaf ornament of the seventeenth century, marked a period in its existence when the owner enlarged his ancestral home as the prosperity of his house increased. The members could not fail to be attracted by the amount of oak panelling which covered the walls of the hall and the passage without the hall, which in its earliest days constituted a part of the hall itself. The examination of the oak panels should not be a cursory one, for three distinct varieties of the linen pole or ribbon pattern might be distinguished, and he would especially draw attention to that in the passage, which was of a pattern generally unknown—in fact, unusually met with. To cover the entire walls with panels would be an item of great expense, an expense which could not in many cases be borne at one time. This might account for the variety of panels which were acquired in various years and from different sources. Besides these features of interest there were above the colonnade rooms decorated with mural designs, in many cases as perfect as they were upon the day when sketched on the walls. Grotesque heads, armorial bearings, and panels might be seen well drawn on the walls of these rooms and passages. The armorial bearing (Gosnold quartering Persons and Naunton) gave a clue to the occupier who erected that wing, if not, indeed, to the founder of the hall itself. There was one feature in this room which is worthy of notice, viz., the sanitary arrangement, which was so worked into the extensive chimney that, in his opinion, it had some advantages at least over the present-day system. There is a design on the wall which was believed to represent Otley Hall when first built. After they had viewed the interior, he (Mr. Redstone) would advise them, they should walk to the rear of the premises, and look at an addition which, save for the window, formed one of the prettiest parts of the house, and also at the wide moat which once surrounded the hall. At a little distance across an adjacent field is a square moated enclosure which he considered was the site of the original hall. He could not speak with any degree of certainty as to who was the founder of this hall, but it was probable that it was founded by a member of the Gosnold family. Robert Gosnold removed from his residence in Clopton, which he sold to Thomas Rouse, and which was afterwards known as "Rouse Hall," to settle in Otley. A John Gosnold, Solicitor-General, represented the Ipswich burgesses in Parliament in 1547, and the monument to John Gosnold, who died in 1628, declared the connexion of the family with the Royal House of York. The support which Robert Gosnold gave to the Royal cause brought the house to a state of poverty, so that the Rev. Lionel Gosnold, rector of the parish, was compelled to sell his estate. The visitors then went round the hall both internally and externally. The party next visited Otley Church and Otley Barrow. As to the latter Mr. Redstone read a paper, in which he gave some information concerning the earthworks in Suffolk. At Otley Church Mr. Redstone pointed out the chief features of the building, and the vicar, the Rev. H. Gretton, conducted the party round, and showed the baptistry provided for the baptisms of adults—and he said there were only two churches in England that had a baptistry of the kind. This brought the day's proceedings to a close.

ARCHITECTURAL SOCIETIES.

NOTTINGHAM ARCHITECTURAL SOCIETY.—The report of this society for the past year states that it has been "an uneventful one as far as the work of the Society is concerned." This is the fortieth year of existence of the Society, which has grown from a membership of twenty-two at its commencement to a total of thirty-seven members, two honorary members, and twenty-one Associates. There was last year an increase of four in the number of members, but a decrease of two in that of the Associates. As it is from the latter class that future members will come, the Council regret that members in practice do not urge their assistants and pupils to join the Society. During the past year, on the initiative of Mr. A. N. Bromley, a supplementary clause has been added to the Society's form of contract restricting the cost of arbitrations, and is now printed in the same in such a way that members may use it or strike it out, as they think best. The Council are pleased to record the fact that this form of contract is now being largely used by members, the sales during the year amounting to forty-three copies. In last November the terms of a competition promoted by the Nottingham Savings Bank were brought to the notice of the Council, and the President and hon. secretary were deputed to interview the managers and explain to them the competition suggestions of the R.I.B.A. This was done, and the managers promised to give careful consideration to the matter, but nothing further has been heard from them as to their decision.

DINING SALOON OF P. & O. S.S. *MONGOLIA.*

THIS drawing shows a part of the decoration for one end of the dining saloon of the s.s. *Mongolia*, now being built by Messrs. Caird & Co., of Greenock, for the Peninsular and Oriental Steam Navigation Co.

The work is being carried out in English oak, from the designs and under the superintendence of Mr. T. E. Collcutt.

ENGINEERING SOCIETIES.

ASSOCIATION OF WATERWORKS ENGINEERS.—The seventh annual general meeting of the Association will be held at Leicester on Tuesday, Wednesday, Thursday, and Friday, July 22, 23, 24, and 25, under the presidency of Mr. Frederick Griffith, M.Inst.C.E., Waterworks Engineer to the Corporation of Leicester. Among the subjects to be discussed are papers on "Rural Water Supplies," "Standardisation of Water Fittings," "Turbine Pumping Plant at the Guildford and at the Windsor Waterworks," "Electrolysis of Cast-iron Water Mains." A lecture, entitled "Domestic Filtration," will be delivered by Dr. Joseph Priestley. Arrangements have been made to visit the Bradgate Pumping Station, reservoir and filter-beds, &c., and the Swithland reservoir, pumping station, &c., of the Leicester Corporation Waterworks; the Blackbrook reservoir and masonry dam (in course of construction) of the Loughborough Corporation Waterworks; the Billing-road Pumping Station, the Stimpson-avenue reservoirs, tower, and pumping plant, and the Ravensthorpe reservoir. A large number of works and places of interest in Leicester and neighbourhood will be open to inspection on presentation of the admission-card. The annual dinner of the Association will take place in the Mayor's Rooms, Museum Buildings, on Tuesday, July 22, at 7 p.m.

"SIMPSON'S," THE STRAND.—A special jury was sworn in last week at the Clerkenwell Sessions in respect of the compulsory acquisition of these premises for the improvement of the Strand, south side, between Beaufort-buildings and Terry's Theatre. During the absence of the jury, who went to see the property and its site, the parties came to an agreement as to terms for compensation. The award amounts to 54,500*l.*, to include fixtures, furniture, plant, and costs—the stock to be taken on valuation. Simpson's, with its divan and dining-rooms, on the site of the old Fountain Tavern, will be vacated on August 1 next.

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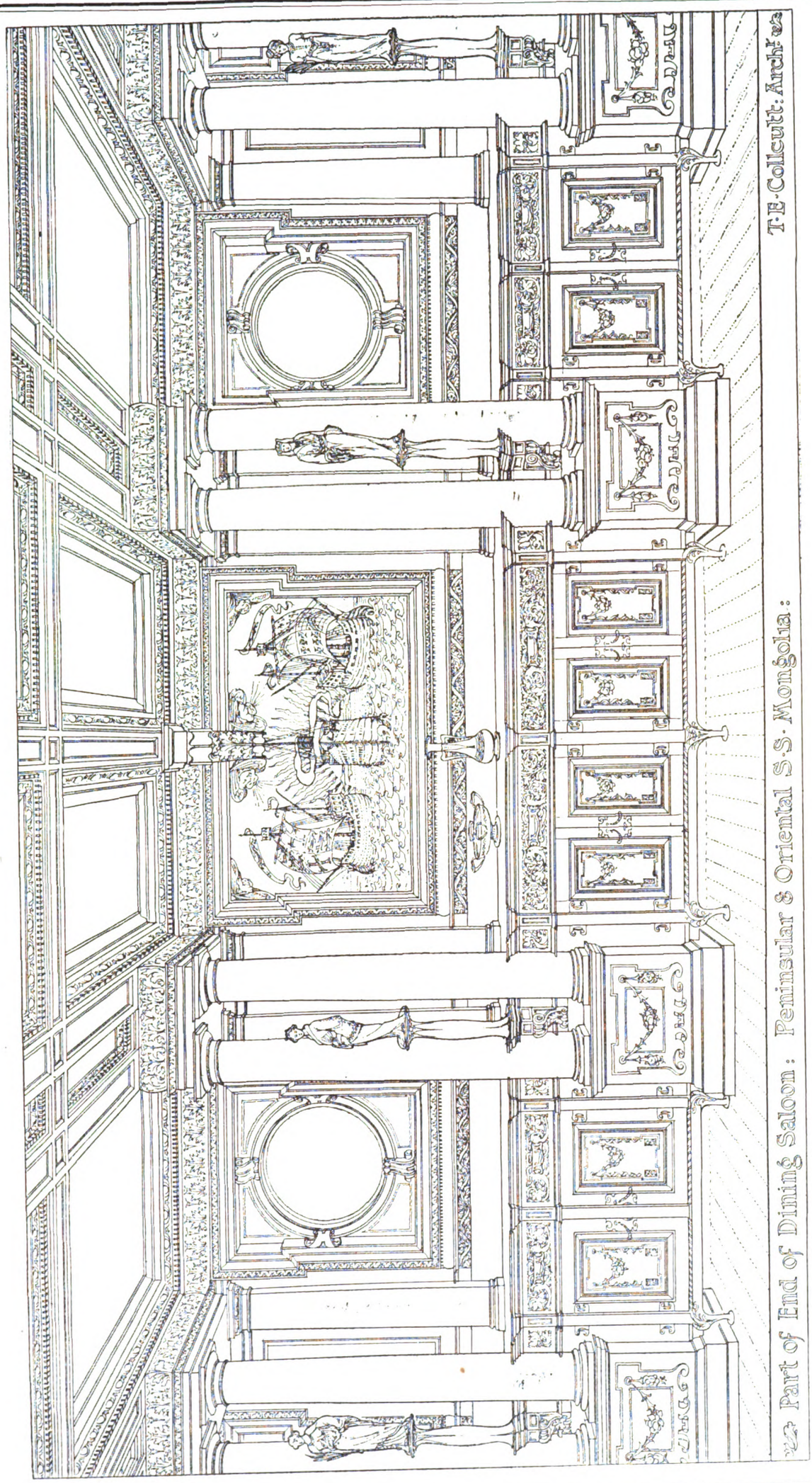

Part of End of Dining Saloon: Peninsular & Oriental S.S. Mongolia: T. E. Collcutt, Archt.

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ROYAL ARCHITECTURAL MUSEUM AND WESTMINSTER SCHOOL OF ART.

THE annual general meeting of this institution was held on Thursday last week at the Museum, Tufton-street, Dean's Yard, Westminster, Mr. W. Emerson, the President, in the chair.

The Council, in their Report, referred with regret to the death since the last meeting of two of the oldest subscribers to the Museum—Mr. J. Brooks and Mr. H. Currey. During the past year the glass roofs of the older portion of the building had been renovated, and the front parapet and other parts of the fabric had been repaired. The total cost of the work amounted to 700*l.*, to assist in which the Technical Education Board of the London County Council had advanced 350*l.*, without interest, repayable in four instalments (100*l.* a year for the first three years and 50*l.* for the fourth year), to be deducted from the annual grants made by the Board to the School of Art. Towards the cost of this unavoidable renovation the President had contributed a donation of 21*l.*; 20*l.* had been received from the Westminster Trust for Free Art Studentships; 10 gs. from Mr. J. P. Seddon (Vice-President); and 7*l.* from Messrs. Lee & Pain. The use of the museum by students and other visitors had been somewhat on the increase since the arrangement with the Royal Institute of British Architects was made, under which their students and the students of the Architectural Association were allowed to sketch without payment of a fee, during the hours when the museum was open to the public. The Westminster School of Art continued to be thoroughly appreciated, not only by advanced students, but by various artists of high standing. The evening classes, except the men's life class, had still further declined during the past year, owing doubtless to the cause referred to in last year's report—the increase in the number of drawing-classes established in various parts of London at nominal fees, and even without payment. On the other hand the grants received from the Board of Education for the Session 1900-1 amounted to 206*l.* 12s. 1d.—upwards of 30*l.* in advance of grant for the Session 1899-00. The authorities of the Board of Education had recently resolved on a new form of payment to apply to the Session 1902-3, and thenceforward basing their grant on an average of the payments made during the last three years, subject to periodical assessment at intervals. The balance-sheet showed that the expenditure for the year had exceeded the income by 157*l.* 10s.

Mr. J. P. Seddon, in proposing the re-election of Mr. Emerson as President for the ensuing year, said he thought it was a great advantage to the school to have a professional man like Mr. Emerson occupying the position of President.

Mr. W. M. Fawcett seconded the proposition, which was carried unanimously.

The Chairman then proposed the adoption of the Report and balance-sheet. He said that on the whole he thought it was a very satisfactory report and statement of accounts. That there should be a deficit of 157*l.* this year was easily understood when they remembered the large amount of money they had had to spend in repairing the roofs, &c. He was sorry that they had had to incur such a large expenditure and not been able to do something in connexion with the rehanging of the casts. However, that would come later, and seeing that they had paid off what the London County Council had already advanced, and that they would only have 100*l.* to pay off next year, he thought that the accounts would probably right themselves in the course of the current session. He was sorry to see that the evening classes had again somewhat declined, but he would not go into the cause of that, as it was fully dealt with at the last meeting. Upon the whole the receipts from classes did not appear to have been very much less, which was a matter of satisfaction.

Mr. W. Brindley, in seconding the motion, said that although he had known the museum a great number of years he had never known it to be in such a healthy state as it was now. The progress which had been made was sufficient to encourage them to go on, and take no notice of the trouble which had befallen them in the expense to which they had been put in connexion with the roofs.

The motion was carried.

Mr. J. H. Pollen, in proposing the re-election of the vice-presidents, said that those gentlemen had been of great service to the museum in the past by speaking well of it to the world, and they could not do better than re-elect them.

Mr. S. W. Lee seconded the proposition, which was agreed to.

Mr. Maurice B. Adams, hon. secretary, proposed the re-election of the council. He remarked that the council met very frequently during the year to consider ways and means, and the best way to administer the institution, the clerical work of which was very considerable; and in that connexion perhaps he might be allowed to say how greatly they were indebted to the assistant secretary, Mr. Ford. He was sure that all the members of the council were actuated with the one desire to do the best for the institution, and he had much pleasure in proposing their re-election.

Mr. W. Pain, in seconding the motion, which was carried, said that as secretary of the Art Committee he could endorse what Mr. Adams had said as to the value of Mr. Ford's services—in fact, he did not know how they would get on without him.

On the motion of Mr. Fawcett, Mr. E. L. Somers Cocks was re-elected treasurer, and Messrs. W. Pain and P. D. Leake, auditors of the school.

Mr. Seddon said he would like to draw public attention to the Westminster Trust for Free Art Studentships, the object of which was to give tuition to a number of students in drawing and modelling at evening classes of the school. Candidates must be workmen resident within the City of Westminster, or sons and daughters of such workmen, and preference was given to those who lived in the parishes of St. Margaret's and St. John the Evangelist. The Trust was intended for those who could not afford to pay the fees themselves, but he did not think its existence was as widely known as it deserved.

On the motion of Mr. Pollen, a vote of thanks was accorded the Chairman for presiding.

The Chairman, in reply, said he was much obliged for that vote, and also for his re-election as President. He was interested in the institution, and would be glad to see it in a much more prosperous condition, and see it possess a much larger number of samples of different kinds of architecture than it now exhibited. Of course, while they were in low water they could not expect to increase their list of casts very much, but he had no doubt that would come in time, especially now that they had got rid of the annual worry of small repairs to the roofs, which constantly frittered away money. He thought their thanks were due to Mr. Seddon for having obtained the grant from the Westminster Free Art Studentship Trust and also for his own personal devotion to the school so freely given. He thought they might congratulate themselves upon the very excellent works exhibited by the students at the last exhibition and on the talented supervision which the headmaster, Mr. Mouat Loudon, gave to the school. He believed that it held the very first position among the many schools of art in the metropolis, and he could only hope that when they met next year, they would be able to report a surplus instead of a deficit.

This terminated the proceedings.

THE ROYAL INSTITUTE OF PUBLIC HEALTH.

THIS Institute will hold its annual Congress at Exeter from August 20 to 27. More than 450 delegates have been appointed up to the present time, and the principal railway companies have agreed to issue return tickets at a fare and a quarter to persons attending the Congress, on production of a certificate, which the hon. secretaries will supply on application. A subscription of one guinea entitles the subscriber to all the advantages of the Congress.

The following officers of the Congress have been appointed:—President—The Earl of Iddesleigh; Hon. President—The Mayor of Exeter; Hon. Secretaries—Messrs. Edward J. Domville, Edwin Herrin, and Ransom Pickard; Hon. Treasurer—Mr. W. Kendall King, and Messrs. Fox, Fowler, & Co.'s Bank, Exeter; Executive Committee—The Mayor of Exeter, Mr. A. Edward Dunn, the Sheriff of Exeter (Alderman T. Knapman), the Deputy-Mayor (Alderman W. Wreford), the Town Clerk (Mr. G. R. Shorto), the City Surveyor (Mr. Donald Cameron), the Medical Officer of Health (Dr. John Woodman), the Sanitary Inspector (Mr. W. J. G. Wreford), the Rev. F. J. Buckingham (Chairman of St. Thomas Board of Guardians), Mr. A. W. Clayden (Principal of the Royal Albert Memorial College), Dr. Henry Davy, Mr. Mark Farrant, Jun., Mr. J. H. Ley (Chairman of the St. Thomas Rural District Council), Councillor Edwin C. Perry, Councillor H. J. Tolson, Colonel E. H. Vaughan (Chairman of the Heavitree Urban District Council), and Colonel Walker. The sections which deal with sanitary subjects are those of "Chemistry, Climatology, and Bacteriology," presided over by Professor Sims Woodhead; "Engineering and Architecture" (Mr. E. G. Mawbey, Borough Engineer of Leicester); and "Municipal and Parliamentary Hygiene" (Mr. J. A. Bellamy, Mayor of Plymouth). There will be addresses by the Presidents of each section, and visits to Dartmouth, Torquay, and Torquay waterworks, &c. Further information may be obtained from the Hon. Secretaries, the Guildhall, Exeter.

THE LONDON COUNTY COUNCIL.

THE weekly meeting of this Council was held at Spring-gardens on Tuesday, Mr. J. M'Dougall presiding.

Loans.—On the recommendation of the Finance Committee, the following loans were granted:—Bermondsey Borough Council, 28,015*l.*, for electric lighting, dust destructor, and other purposes; Battersea Borough Council, 480*l.*, for additional buildings, and 17,025*l.* for reconstruction of bridges; Stepney Borough Council, 5,869*l.*, for working-class dwellings; Islington Borough Council, 8,630*l.*, for electric lighting; and Strand Guardians, 4,500*l.*, for additional accommodation at workhouse.

Workmen's Dwellings.—The Housing of the Working Classes Committee submitted working drawings, specification and bills of quantities in respect of Thackeray, Dickens, and Coram buildings, Herbrand-street site. These buildings are to be erected for the accommodation of persons displaced by the carrying into effect of the Holborn to Strand improvement; they will accommodate 680 persons in twenty tenements of one room, 100 tenements of two rooms, and forty tenements of three rooms. The total estimated cost of the buildings, including architect's expenses and all incidentals, is 29,098*l.* The Committee had taken steps to invite tenders, and recommended:—"That the estimate of 29,098*l.*, submitted by the Finance Committee, and the working drawings, specification and bills of quantities in respect of Thackeray, Dickens, and Coram buildings, Herbrand-street site, be approved."

This was adopted.

The Committee also reported on the tenders referred to. The tenders were:—

	Including graining of internal woodwork and glazed brick dado to staircases.
Mr. B. E. Nightingale	£26,059 0 0
Messrs. Stimpson & Son	27,088 9 4
Messrs. Marsland & Son	28,904 2 0
Messrs. Martin, Wells, & Co.....	29,161 3 7
Messrs. Spencer, Santo, & Co....	29,250 0 0
Messrs. Holloway Brothers	29,422 0 0

The architect's estimate, which was comparable with these tenders, amounted to 27,598*l.* It would be seen, therefore, that Mr. Nightingale's tender was below the architect's estimate. They recommended:—"That the tender of Mr. B. E. Nightingale, amounting to 26,059*l.*, for the erection of Thackeray, Dickens, and Coram buildings, Herbrand-street site, be accepted.

This was agreed to.

Vaudeville Theatre Arbitrators.—The Theatres and Music Halls Committee reported for the information of the Council the result of the arbitration before Mr. W. Emerson, P.R.I.B.A., with respect to the works required to be executed at the Vaudeville Theatre, Strand, under the Council's sealed notice which was served on October 8, 1901. By the terms of his award the arbitrator confirms all the twenty-three requirements contained in the notice with the exception of the two following:—4. That all wood linings to walls and ceilings of dressing rooms be removed, and be replaced by plaster on metal lathing, and that the present stairs be removed and new stairs constructed in their place in fire-resisting materials in a manner to be approved by the Council. 8. That the gallery staircase be rebuilt to comply with the Council's regulations, and to deliver at a suitable point.

With regard to No. 4, the arbitrator con-

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firmed the requirement except that he directed that instead of removing all the wood linings to the walls and ceilings of the dressing-rooms, and replacing the same by plaster on metal lathing, the owners do protect the partition between the dressing-rooms and the staircase by the removal of the linings where necessary, and do substitute metal lathing and plaster on both sides of this partition, but that they need not protect the ceilings and remaining walls of the dressing-rooms with metal lathing and plaster throughout. He further directed that the stairs be removed and be reconstructed of fire-resisting materials, but that they may be on the same lines as at present. The arbitrator did not confirm requirement No. 8. The award directed that the Council and the owners shall each pay their own costs of the arbitration, and that each of them shall pay one-half of the fee and costs of the award.

The Works Department.—The Works Committee submitted their half-yearly return of works completed by the Works Department, pointing out that during this period the manager of works was responsible for the acceptance and execution of works by the department, and that the works in the statements now submitted were completed before the Council revised the standing orders relating to the execution of works by direct employment of labour, and entrusted to the committee the responsibility for the execution of such works. The thirteen estimated works were those which have been actually completed and certified during the half-year, and comprised the whole of the works completed within that period. The total, however, gave no indication of the turnover of the department, because some of the expenditure on these works occurred previous to the half-year in question, while on the other hand a large part of the expenditure during the six months was upon works which were still unfinished. The approximate expenditure on estimated works for the half-year was 220,000*l.* The net result of execution of the thirteen works included in the statement was a balance of cost below final estimate of 7,339*l.* 15s., equal to nearly 6 per cent. Five works executed under the supervision of the architect show a total saving of 1,451*l.* 9s. 3d. (3¼ per cent.) upon final estimates amounting to 42,787*l.* 15s. 4d.; seven works executed under the supervision of the engineer show a total saving of 6,031*l.* 9s. 7d. (7½ per cent.) upon final estimates amounting to 78,859*l.* 10s. 4d.; while the result of the one work executed under the asylums engineer shows an excess of 143*l.* 3s. 10d. (9½ per cent.) over the final estimate of 1,509*l.* 10s. 5d. Nine of the works have been carried out at a cost below final estimate, while in the case of four works the amount of the final estimate has been exceeded. The standing orders provided that the Committee shall obtain the Council's approval to any excess of cost over final estimate, and it was therefore necessary for the Committee to ask the Council to approve the excesses in the case of works Nos. 1, 2, 12, and 13, although these were more than covered by savings in the case of other works in the statement.

The Committee recommended the Council to approve the several excesses reported upon—namely, Horton Asylum sewage disposal, 143*l.*; Wandsworth Bridge painting, 289*l.*; North Woolwich pumping station, staff accommodation, and smithy, 223*l.*; and Newington gas-meter testing office, 333*l.* 13s. The necessary resolutions were passed.

The Committee also reported that the number of estimated works referred to them for execution and not completed on March 31, 1902, was thirty-nine. Of these, twenty-nine were undertaken at the amounts of the estimates of the several supervising officers, and one at the amount of the manager's own estimate, the total of the accepted estimates for these works amounting to 806,586*l.*, while nine works are being carried out under a schedule of prices. In the case of three of the works in course of execution—viz., Horton Asylum, erection of superstructure; Horton Asylum, erection of central station; and Hackney Wick sewer, the Committee had ascertained that the actual cost would exceed the amounts of the accepted estimates, but it was impossible to state the amount of the excess until the works had been completed and measured. The progress of the other works in hand was at present satisfactory.

This was adopted.

Blackwall Tunnel.—The Bridges Committee reported upon a settlement that had taken place at the Blackwall electric lighting station. It had, the Committee stated, become necessary to carry out a considerable amount of underpinning, and they recommended "that the supplemental estimate, amounting to 3,700*l.*, submitted by the Finance Committee be approved, and that an expenditure of a sum not exceeding that amount for repairs to the Blackwall Tunnel electric lighting station be authorised, and that the work be carried out by the Works Department as a jobbing work."

This was adopted.

Boadicea Statuary Group.—The Highways Committee reported:—The placing in position on the Victoria Embankment of the Boadicea statuary group, by the late Mr. Thomas Thorneycroft, and presented to the Council by his son, Mr. J. I. Thorneycroft, is nearly completed, and we have had under consideration the question of what suitable inscription should be placed on the pedestal on which the group stands. We have been in communication on the subject with Mr. W. J. Bull, M.P., who, while he was a member of the Council, and since, has taken a great interest in matters relative to the group, and have also had the advice of the Clerk of the Council; and we submit, for the Council's approval, the inscriptions which we propose. It will, no doubt, be noticed by the Council that we have introduced into one of the inscriptions the true spelling of the name of the British Queen. Public monuments should be educational as well as ornamental; and, as so high an authority as Dr. Rhys pronounces the popular name Boadicea to be "the gibberish of editors," and gives ample authority (see Rhys' "Celtic Britain," p. 278) for the spelling we have added, we deem it advisable to indicate this in the inscription. We recommend—

That inscriptions, as follows, be placed on three sides of the pedestal of the Boadicea statuary group on the Victoria-embankment:—

1. "Boadicea (Boudicca), Queen of the Iceni, who died, A.D. 61, after leading her people against the Roman invader."
2. "Regions Cæsar never knew,
Thy posterity shall sway."—Cowper.
3. "This statue, the work of Thomas Thorneycroft, was presented to London by his son, John Isaac Thorneycroft, C.E. It was cast by public subscription, and accepted by the London County Council, who placed it here, A.D. 1902."

In reply to several questions, Mr. Benn, on behalf of the Committee, agreed that the inscription should be regarded as temporary, to admit of further discussion of the question of the Queen's name.

Proposed New County Hall.—Captain Hemphill moved:—"That in view of the delay, waste, and extravagance caused in the management of the affairs of London by the inadequate and scattered accommodation at present provided for the offices of the various departments of the London County Council, it be an instruction to the Special Committee on New Offices to bring up a report to the Council at the earliest possible date as to the suitability or otherwise of the possible sites to be occupied by a County Hall upon land under the present control of the Council or upon other available sites."

After some discussion this was adopted.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE following applications as reported upon by the Building Act Committee were dealt with at Tuesday's meeting of the London County Council. Unless otherwise stated consent was given. The name of the applicant appears between parentheses:—

Lines of Frontage and Projections.

Kensington, North.—An iron and glass shelter in front of the Ladbroke Hall, No. 124, Ladbroke-grove, Kensington (Mr. M. Zimmermann).

Hackney, South.—A block of buildings, to be inhabited by persons of the working class, on the east side of London-fields, Hackney (Mr. R. Robertson, on behalf of the Improvement Committee of the Council).

Hampstead.—A church on the east side of Finchley-road, Hampstead, at the corner of Frognal-lane (Messrs. W. A. Pite and R. S. Balfour).

Lewisham.—An iron porch at the entrance to No. 27, Silverdale, Sydenham-road (Mr. J. Pratt).

Lewisham.—A porch in front of No. 52, West-hill, Sydenham (Mr. S. E. Baker).

Strand.—A building on the site of Nos. 352 and 353, Strand (Mr. T. E. Collcutt).

Clapham.—Two buildings, with shops on the ground floor, on the east side of Northcote-road, Battersea, to abut upon Broomwood-road (Mr. J. Dickeson).—Refusal.

Islington, North.—A wood and slate hood at the entrance, and a wood and glass verandah at the rear, of No. 97, Seven Sisters-road, Holloway (Mr. J. Farrer).—Refusal.

Lewisham.—A sign to project in front of No. 24, Dartmouth-road, Forest Hill (Mr. R. S. Y. Fowler).—Refusal.

Width of Way.

Hackney, South.—An extension of the period within which the erection of five houses on the west side of Brookfield-road, Hackney, was required to be completed (Messrs. Cubitt, Nichols, Sons, & Chuter).

Fulham.—A one-story workshop on the forecourts of Nos. 14 and 16, Fane-street, Fulham, with the external walls of such workshop at less than the prescribed distance from the centre of the roadway of the street (Mr. C. H. Isaacs).—Refusal.

Space at Rear.

Whitechapel.—Deviations from the plan certified by the District Surveyor, under such section of the Act, so far as relates to the proposed rebuilding of the Horse and Groom public-house, Church-lane, Whitechapel (Mr. R. Miller).

Wandsworth.—A modification of the provisions of that section with regard to open spaces about buildings, so far as relates to the proposed erection of two houses on the west side of Cloudesdale-road, Wandsworth, northward of Foxbourne-road, with irregular open spaces at the rear (Mr. J. H. Slade)—Refusal.

Width of Way, Line of Frontage, and Projections.

St. George, Hanover-square.—An addition at the first floor level of No. 2, Hill-street, Mayfair, to abut upon Farm-street (Mr. F. G. Richardson).—Refusal.

Kensington, South.—Enclosed porches at the front entrances to Nos. 2, 3, 4, and 5, Charles-street, Kensington, with the forecourt fence at less than the prescribed distance from the centre of the roadway of the street, and with the porches (Mr. D. Brown).—Refusal.

Woolwich.—Six houses, with shops on the ground floor, on the south side of High-street, Eltham, at the corner of Park-place, with the external walls of such houses at less than the prescribed distance from the centre of the roadway of High-street (Messrs. Kennard Brothers).—Refusal.

Width of Way, Lines of Frontage, Height of Building and Projections.

Paddington, North.—Buildings with porches, bay windows, towers and balconies on the site of Nos. 5 to 35 (odd numbers only, inclusive), Maida-vale, Paddington, to an advanced line of frontage in that street, with the external walls at less than the prescribed distance from the centre of the roadway of Lanark-place, and with portions of the proposed buildings to exceed in height the width of Clarendon-passage as proposed to be widened (Messrs. Boehmer & Gibbs).

Formation of Street.

Paddington, North.—The widening and adaptation for carriage traffic of Clarendon-passage Maida Vale, and in connexion therewith the removal of the wall and steps across the eastern end of Clarendon-terrace (Messrs. G. H. and A. Bywaters).

Woolwich.†—The formation or laying out for carriage traffic of streets out of the north side of Elizabeth-street, North Woolwich (Messrs. Tapp & Jones).—Refusal.

Formation of Street and Lines of Frontages.

Greenwich.—The formation or laying out of two new streets for carriage traffic on the Page estate on the north side of Woolwich-road, Greenwich, and the widening of Chilver-street (Mr. C. H. P. Turner).—Consent. Also the erection of buildings on the Page estate on the north side of the Woolwich-road, Greenwich (Mr. W. J. Kemp).—Refusal.

Formation of Street, Lines of Frontage, and Height of Building.

Hammersmith.—Reformation or laying out of a new street for foot traffic to lead from Shepherd's Bush-green to Pennard-road, Shepherd's Bush, in connexion with the erection of a theatre building (Mr. O. Stoll). Also, a theatre building on the west side of Shepherd's Bush-green, Shepherd's Bush, in advance of the line of the buildings northward, and to exceed in height the width of the proposed new footway upon which the building will abut (Mr. F. Matcham).

Cubical Extent.

Newington, West.—An addition to engineering workshops at rear of Nos. 11 to 23, Falmouth-road, Great Dover-street, Newington, by reason of which addition the building will exceed in extent 250,000 cubic feet, but not 450,000 cubic feet, and which building will be used only for the purposes of the manufacture of hydraulic cranes, hoists, lifts, &c. (Mr. J. W. Brooker).

Wandsworth.—At the tramway stables, Balham High-road, of an addition to the car shed by reason

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of which addition such shed will exceed in extent 250,000 cubic feet, but not 450,000 cubic feet, and which shed will be used only as a shelter for tramcars (Mr. E. J. Edwards).

Alteration to Building.

Hampstead.—Formation of a bedroom in the roof of No. 36, Sumatra-road, Hampstead, without the walls being increased to the thickness required by the first schedule of the Act (Mr. J. D. Hunter).—Refusal.

*** *The recommendation marked † is contrary to the views of the Local Authority.*

Illustrations.

PORTRAIT OF MR. T. E. COLLCUTT.

IN accordance with our usual custom for a good many years back, we give, in this number in which the presentation of the Royal Gold Medal of the Institute is reported, a portrait of the recipient of the medal, Mr. Thomas E. Collcutt, F.R.I.B.A. The portrait is reproduced from a photograph which Mr. Collcutt kindly lent for the purpose.

Mr. Collcutt was a pupil of Street, though he did not follow much in Street's footsteps; he has never been essentially "a Gothic man," and he early struck out a style or a manner of his own in Free Classic. This manner, and many little forms of detail characteristic of it, have been so much imitated that many of the younger generation have probably lost sight of their originator, and are not aware what a remarkable influence Mr. Collcutt had in promoting the improvement and refining of London street architecture.

Mr. Collcutt's great work is of course the Imperial Institute, in which the best qualities of his style are illustrated, though it may be admitted that the detail is a little over-refined, and approaches a little too much to the character proper to furniture detail. On the other hand there is nothing in it that is unrefined, though one may feel that a building on a great scale wants a little more force. The City Bank, Ludgate Hill, is an excellent and typical specimen of his street architecture. The architectural clothing which Mr. Collcutt put upon the shell of the English Opera House (now, alas! only a music hall), renders it the only picturesque building of its class in London; and the thought and refinement which he could bring to small works was very well illustrated in his design for the memorial to an eminent Parsee, which was illustrated in our issue of July 6, 1901.

Mr. Collcutt is a thoroughly practical architect, and in the great competition for the new Christ's Hospital Schools at Horsham his plans were, we believe, the only ones which received serious consideration as possibly rivalling the plans of Messrs. Webb & Bell, ultimately selected.

We illustrate this week two of Mr. Collcutt's latest designs; one for a front in the Strand, and one, which will be found on page 639, of the decoration of a cabin in one of the P. & O. Co.'s steamers.

FRIEZE: "LIFE'S INITIATIONS."

THIS frieze, symbolical of certain aspects of Life, must be regarded as divided into three subjects or series, represented by the three lines of the design on the plate. Their intention may be described as follows:—

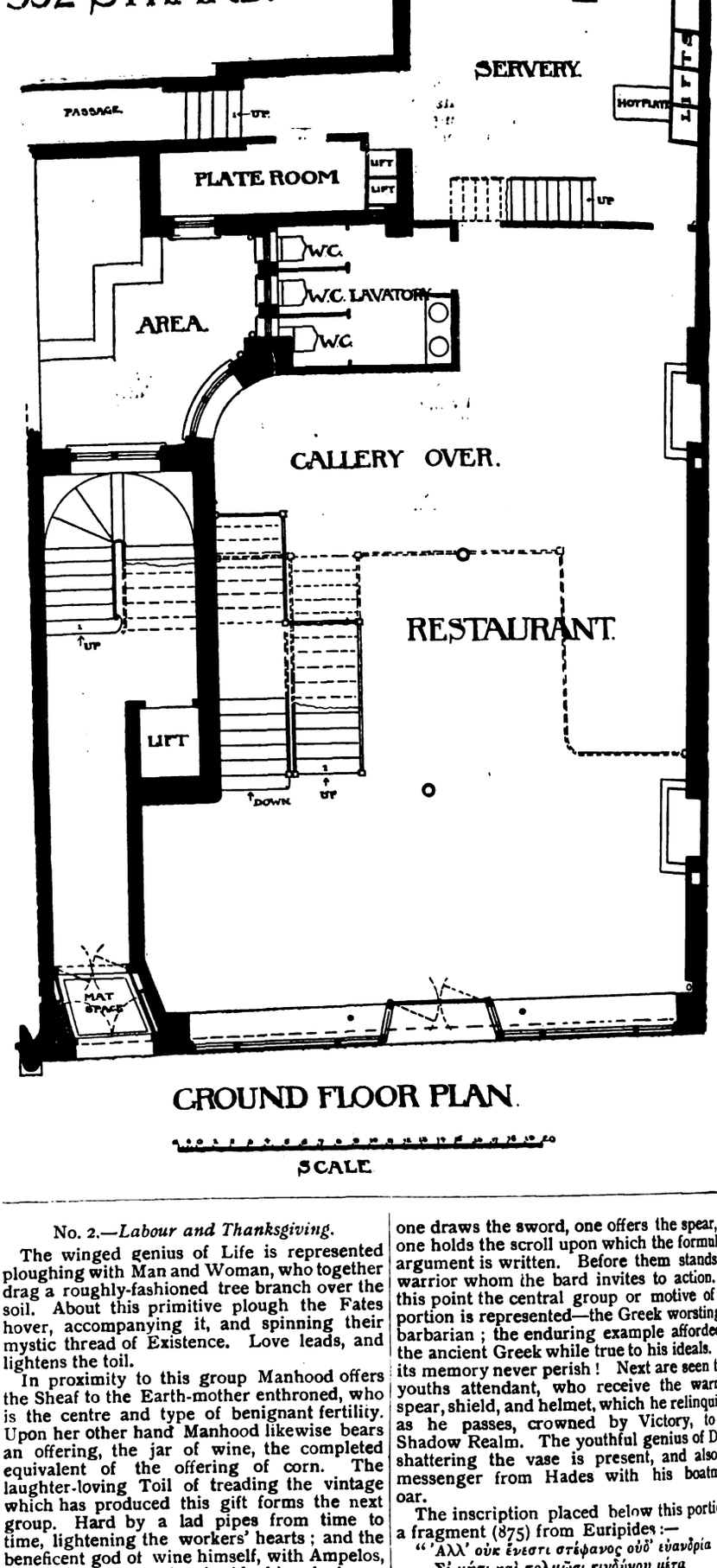
No. 1.—*Unrest and Quest.*

Viewed from the front, and proceeding from left to right, the subjects represented are, first, Childhood, where the child in the arms of father and mother rests a hand embracingly on each parent. Next, Emancipation of the child from the trammels of mother and nurse. And then, Hermes, the young God of Travail, gives the cup of discontent and unrest, while Athena, Goddess of Wisdom, prompts. Here comes the central group or lesson of this portion, Theseus with the Marathonian bull, implying the domination of the brute nature. Beyond this, Youth is shown passing from Comedy, whose mask he discards, to Tragedy, and by her guidance to the Harmonies and Arts, who will give him the gifts and teach him the graces which make life worth living.

The line of inscription beneath is a fragment (779) from Sophocles:—

"Προσλαμβάνειν δὲ δεῖ πρὸς ἡμέραν ἀεὶ
Σ"ως ἂν ἐξῇ μαν θάνειν βελτίονα."

"Each day we need to take some forward step
Till we gain power to study nobler things."



No. 2.—*Labour and Thanksgiving.*

The winged genius of Life is represented ploughing with Man and Woman, who together drag a roughly-fashioned tree branch over the soil. About this primitive plough the Fates hover, accompanying it, and spinning their mystic thread of Existence. Love leads, and lightens the toil.

In proximity to this group Manhood offers the Sheaf to the Earth-mother enthroned, who is the centre and type of benignant fertility. Upon her other hand Manhood likewise bears an offering, the jar of wine, the completed equivalent of the offering of corn. The laughter-loving Toil of treading the vintage which has produced this gift forms the next group. Hard by a lad pipes from time to time, lightening the workers' hearts; and the beneficent god of wine himself, with Ampelos, the genius of the vine, beside him, looks on approvingly.

The inscription beneath is from the close of Pindar's XII. Pythian ode:—

"Σὶ δέ τις ὄλβος ἐν ἀνθρώποισιν, ἄνευ καμάτου οὐ φαίνεται."

"And if there be any happiness among men, it appears not without toil."

No. 3.—*Philosophy and Conquest.*

Winged Destiny, blindfold, here stands holding uneven balance in the rear of a group of three exponents of philosophy, of whom one draws the sword, one offers the spear, and one holds the scroll upon which the formulated argument is written. Before them stands the warrior whom the bard invites to action. At this point the central group or motive of this portion is represented—the Greek worsting the barbarian; the enduring example afforded by the ancient Greek while true to his ideals. May its memory never perish! Next are seen three youths attendant, who receive the warrior's spear, shield, and helmet, which he relinquishes as he passes, crowned by Victory, to the Shadow Realm. The youthful genius of Death shattering the vase is present, and also the messenger from Hades with his boatman's oar.

The inscription placed below this portion is a fragment (875) from Euripides:—

"'Αλλ' οὐκ ἔνεστι στέφανος οὐδ' εὐανδρία
Σὶ μήτι καὶ τολμῶσι κινδύνου μέτα
Οἱ γαρ πόνοι τίκτουσι τῆν εὐανδρίαν."

"Of courage none makes proof, none gains the crown,
Save him who peril dares; for courage is
The child of enterprise."

This frieze was exhibited at the Liverpool Autumn Exhibition of last year.

J. STAINES BABB.

FRONT, No. 352, STRAND.

THIS building is being erected from the designs of Mr. T. E. Collcutt for Messrs. M.

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Salaman & Co. The lower portion of the premises will be used as a restaurant, and the upper part as offices. The elevation is carried out in Portland stone.

THE MEDEA MONUMENT, COLLEONI CHAPEL, BERGAMO.

THIS drawing shows a part of the monument in the Colleoni Chapel, Bergamo, erected by the great Venetian captain in memory of his daughter Medea. The figure and central panel are by Amadeo; the cherubs would hardly appear to be by that sculptor. The architectural portion is drawn by Mr. W. Curtis Green; the figures of Amadeo's work are drawn by Miss E. M. Green.

WEST PORCH, CREMONA CATHEDRAL.

THIS porch is only one of many very similar examples, in which Cremona is particularly rich. The later arcade abutting it rather detracts from the general effect. The drawing is by Mr. W. Curtis Green.

BOOKS RECEIVED.

A PRACTICAL TREATISE ON GAS AND OIL ENGINES. By Frederick Grover, A.M.Inst.C.E. Third edition. (Technical Publishing Co. 5s.)

PAINT AND COLOUR MIXING. By A. S. Jennings. (E. & F. N. Spon. 5s.)

WESTMINSTER. By Sir Walter Besant and G. E. Mitton. (Adam & Charles Black.)

CHELSEA. By G. E. Mitton. (Adam & Charles Black.)

THE BUILDING TRADES POCKET-BOOK. (Robert Hall: Bury. 1s.)

MODERN MURAL DECORATION. By A. Lys Baldry. (George Newnes. 12s. 6d.)

NOTES ON THE CONSTRUCTION AND WORKING OF PUMPS. By E. R. C. Marks. (Technical Publishing Co.)

Correspondence.

THE CORONATION BUILDING AT WESTMINSTER ABBEY.

SIR,—Your observations on this case represent the sentiments of many others respecting it. We will admit that a building was necessary in the position, but, having regard to the other proprieties to be considered in the case, and this particularly, that such a building must be absolutely out of character as any *permanent* appendage to a church or cathedral (it would never have been tolerated by any mediæval architect of ecclesiastical authority), we might have expected from qualified minds that everything in the way of permanency of character in an excrescence of the kind would have been intentionally avoided, and that every line and feature of the structure would have been made to express the purpose of it to be *purely temporary*.

But no such thing. For some foolish reason the building has been made to assume the appearance of being part of the Abbey of the period of the Jerusalem Chamber, and silly pains have been taken to further the illusion by imparting to it a grimy antiquity.

Could folly like this further go?

F. S. A.

The Student's Column.

PART III.—PRIVATE SEWAGE DISPOSAL.

CHAPTER 25.—BACTERIAL PURIFICATION.

WHILE it has been known for ages that the decomposition and ultimate purification of organic matter can be entirely effected by natural processes, it is only within the last quarter of a century that the causes of these changes have been discovered, and even at the present time our knowledge is far from complete. Changes which were at one time thought to be due to chemical and mechanical action are now known to be biological. Immense numbers of vegetable organisms, known collectively as bacteria, grow and accumulate under certain conditions in sewage, and produce in it important changes, among which are the breaking up of solids and the conversion of putrescible organic matter into gases and inorganic matter. These changes have been observed from time immemorial in manure which has been applied to cultivated land; in a few weeks or months all trace of the manure has vanished—it has been changed into gases, humus, and food for plants.

It has now been demonstrated that the changes which take place in organic matter applied to the soil can be effected under more or less artificial conditions. Filters for sewage have ceased to be regarded as mere strainers by which the grosser solids are held back in a mechanical way, but are known to have a similar action to that of soil; they are, in fact, beds in which the purifying bacteria rapidly develop at the expense of the organic matter in the sewage. Bacteria are also at work in sewage stored in bulk, as in a tank or cesspool.

Many different kinds of bacteria have been distinguished, but those which are of the greatest service in the purification of sewage are now usually divided into two principal classes (1) anaërobic and (2) aërobic. Anaërobic organisms—that is to say, those which can live without air—may be either "obligate" or "facultative," the former term being applied to organisms which cannot develop in the presence of oxygen, and the latter to those which can grow and multiply either with or without oxygen. Aërobic organisms are those which require oxygen for the due performance of their functions. Anaërobic bacteria are supposed, by many authorities, to play an important part in the liquefaction of the organic solids in sewage, while the function of aërobes is to oxidise the organic matter in solution and render it inoffensive. Dr. Rideal, for example, thus summarises the changes which take place in the purification of sewage by bacteria:—

	Substances dealt with.	Characteristic Products.
Initial.		
Transient aërobic changes by the oxygen of the water supply, rapidly passing to—	Urea, ammonia, and easily decomposable matters.	
First Stage.		
Anaërobic liquefaction and preparation by hydrolysis.	Albuminous matters; cellulose and fibre; fats.	Soluble nitrogenous compounds; phenol derivatives; gases; ammonia.
Second Stage.		
Semi-anaërobic breaking down of the intermediate dissolved bodies.	Amido-compounds; fatty acids; dissolved residues; phenolic bodies.	Ammonia; nitrites; gases.
Third Stage.		
Complete aëration: nitrification.	Ammonia and carbonaceous residues.	CO_2, H_2O, and nitrate.

It is well to state that doubts have been cast on the theory as to the important part played by anaërobic bacteria. Thus, Dr. Adeney mentions a series of experiments carried out by him with a very foul sewage. "I have allowed it," he says, "to fall slowly drop by drop through about 1½ ft. depth of a filter composed of coarse pieces of pumice. I have started this experiment in the evening, and I have found next morning that the liquid that has passed through this pumice float (*sic*) has been completely fermented so far as the organic matters were concerned." In other words, *aërobic* fermentation of a foul sewage had taken place in the course of a few hours. Another sample of the same sewage placed in a cylinder about 15 in. high, where the conditions were partly aërobic and partly anaërobic, took eleven days to undergo the same change as completely. He admits that a condition was absent from his experiment which some of the advocates of anaërobic bacterial action claim to be essential, namely, large surface areas of sewage upon which an extensive growth of anaërobic bacteria can take place, but he considers that this is of comparatively little importance, and that the theory is "pure hypothesis; they get certain results which they explain as a direct influence of anaërobic fermentation, but which I should feel inclined to explain in another way."

Drs. Kenwood and Butler also are of opinion that it may be disputed whether aërobic or anaërobic conditions are the more favourable for the liquefaction of the organic matter in suspension and for reducing the stability of the more stable organic matter, but (they add) "while it is an open question how far the disintegration, liquefaction, and decomposition of sludge is hastened by maintaining it under strictly anaërobic, as against aërobic, conditions, it does not appear that there is any gain by keeping liquid sewage free from contact with the air; and our observation shows that sewage hastens to its ultimate goal of inoffensiveness by the oxidation of its polluting matter, undeterred, and indeed favoured, by the fact that from the outfall it is freely exposed to the air."

We need not go further into the rival theories, but a statement of them was necessary in order to explain the different methods of bacterial treatment which are now so strenuously advocated. Those who believe that anaërobic conditions are an important preliminary stage in the purification of sewage, advocate the slow passage of the sewage through a tank or upward filter before it is allowed to flow to the contact-bed or aërated filter. Those who are not so certain on the point consider that the only preliminary treatment required is a rough screening and sedimentation, the purification being effected by passing the sewage through a succession of two or more contact-beds or filters, where the conditions are alternately aërobic and anaërobic. The "Septic" treatment is the typical example of the first method, and the "Sutton" or "Dibdin" is an example of the second.

Speaking broadly, therefore, we have two stages in the purification of sewage, namely, (1) liquefaction of organic matter, and (2) oxidation. Mineral solids, of course, are not acted upon by bacteria to any appreciable extent, and some preliminary settlement of the sewage is therefore necessary, in order that these solids may be deposited and prevented from passing to the bacteria tanks and beds. Grease, straw, and fibres of all kinds are also difficult to liquefy, and it is therefore advisable to retain as much of the grease as possible in grease-traps; straw, peat-moss, &c., may also be partly retained in stable-traps, or by a scum-board and screen at the commencement of the outfall-works. Attempts to purify crude sewage by direct filtration have generally failed in consequence of the coating of the surface of the filter or the choking of the pores, with insoluble or very slowly soluble matters of the kinds mentioned above. The experiments carried out from 1898 to 1900 on London sewage brought out this fact very clearly, and have been confirmed by practical experience at Leeds and other towns. Professor Clowes thus stated the results of his London experiments:—"Since the cellulose substances in the suspended solid matter of the sewage are only dealt with slowly by the bacteria in the coke bed, they tend to accumulate on the coke and to diminish the sewage capacity of the bed; they also tend to diminish the extent of purification from the dissolved organic matters of the sewage." He adds that a very rough process of sedimentation considerably retarded the choking of the coke beds. For three weeks at the end of 1889 the crude sewage arriving at the Southern outfall was allowed to flow (without any chemical treatment) through one of the large settling channels, at an average rate of 7·4 ft. per minute, "the usual rate of flow of chemically-treated sewage being about 1·5 ft. per minute." A portion of this sedimented sewage was then treated in a small coke bed, which was filled and emptied thrice daily. The capacity of the bed was not reduced during the period of treatment, and an average purification from dissolved oxidisable matter was obtained, amounting to 53 per cent., calculated on the sedimented sewage, or 58·7 per cent., calculated on the crude sewage. The percentage purification in this case is only small, but it must not be forgotten that it was obtained by single contact with sewage only roughly sedimented.

Credit must be given to Mr. W. D. Scott Moncrieff for being the first to devise a system of sewage-purification on purely biological lines. The original installation was on a small scale, and dealt with the sewage from a single country-house. It was constructed ten or eleven years ago, and Dr. Houston's analyses of the effluents attracted a good deal of notice when they were published in June, 1893. The principal feature of the original installation is the "Scott Moncrieff cultivation filter-bed." This is a tank about 3 ft. deep, 2½ ft. wide, and 10 ft. long, which receives the whole of the sewage from a household of from ten to twelve persons, with the exception of the grease, which is held back as far as possible

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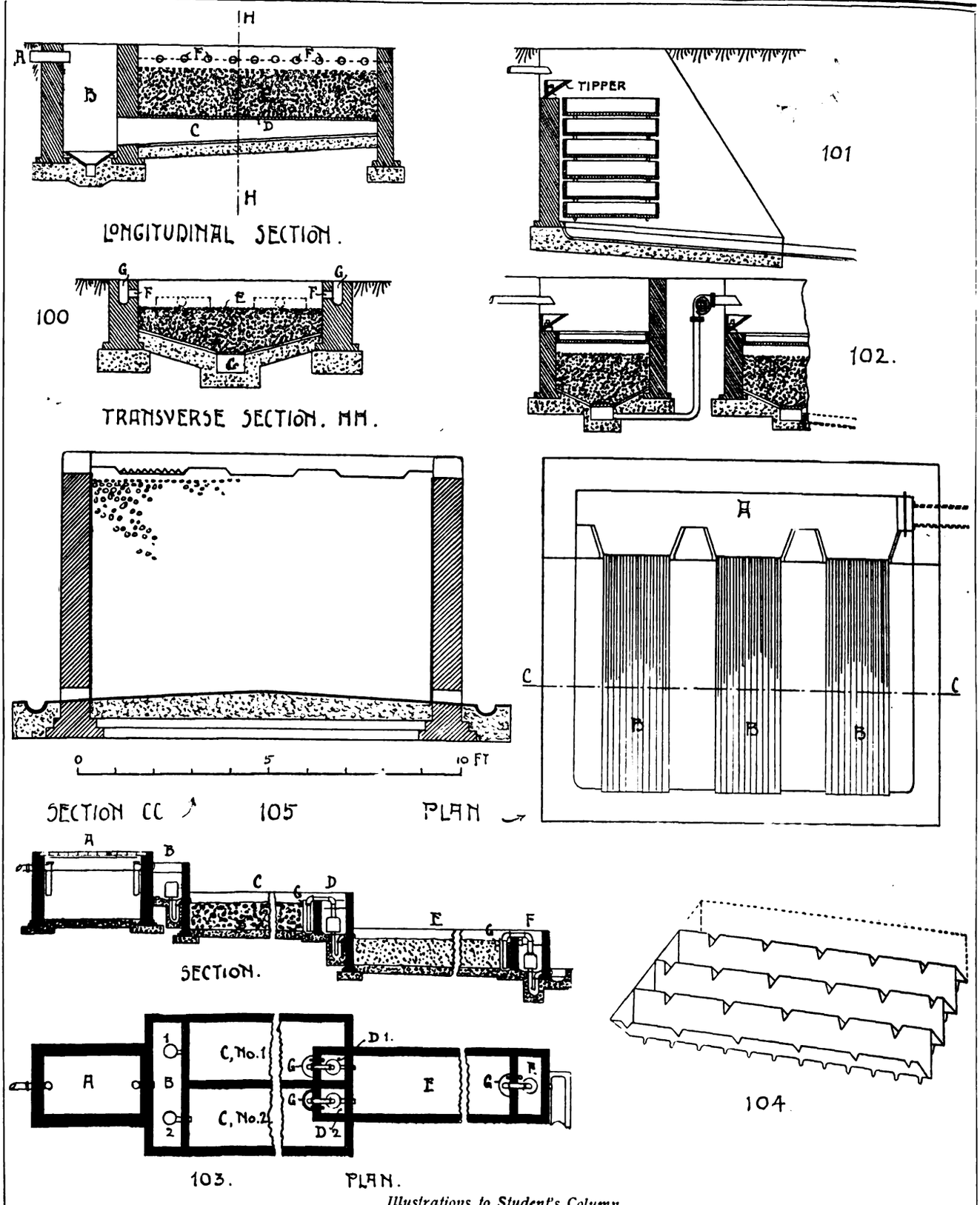

Illustrations to Student's Column.

by a grease-trap. The rainwater also is excluded. A grating is fixed a little above the floor of the tank to form a false bottom, and above the grating are successive layers of flints, coke, and gravel, the total depth of the filtering material being about 14 in. The sewage enters the tank at one end near the bottom, rises through the grating and filtering material, and overflows at the outfall pipe which is about 2 in. below the invert of the drain on the inlet side of the bed. "The cubic capacity of the filter bed," says Dr. Houston, "is thus so small that the natural expectation would be that in a few days the filtering medium would become choked, and a nuisance result. As a matter of fact, however, the reverse of this happens, the effluent up to a certain point actually improving in quality as the time goes on, and the whole process continuing to work satisfactorily and uninterruptedly for months together without constituting a nuisance."

It was soon found that, although the filter bed succeeded in liquefying a large portion of the suspended organic matters in the sewage, the effluent from it was unsatisfactory from a chemical point of view, and Mr. Scott Moncrieff laid down what he termed "nitrifying channels"—half-pipes jointed with cement and filled with coke—through which the effluent from the filter-bed was allowed to flow; these channels were not as satisfactory as the designer anticipated, and various modifications were adopted until finally a system of superposed filtering trays was devised. The effluent from the cultivation tank is discharged by a tipper over the uppermost tray, filters through this, and passes in a shower through a number of holes in the bottom on to the next tray, and so on. These trays are peculiarly interesting, as it is believed that each becomes in time the home of special organisms, the successive trays carrying on the purification in a natural order, and any transposition of the trays leading to a temporary derangement of the process of purification. Judged from a purely chemical standpoint, the effluent from the trays may not be regarded as entirely satisfactory, but, as we have already pointed out, chemists are not yet agreed upon a standard of purity, and evidence is accumulating to show that a purely chemical standard may be very misleading. An effluent may be condemned on analysis, but may yet be in such a state of active bacterial change that it will be rapidly purified when turned into a stream.

CHAPTER 26.—BACTERIAL PURIFICATION (*continued*).

AT the Scott Moncrieff installation at Caterham Barracks the sewage from 1,180 persons and two horses is treated, together with rainwater from certain

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portions of the premises, the daily flow being about 22,000 gallons. The sewage is very strong, having sometimes eighteen parts of chlorine per 100,000, and a remarkable degree of purification is effected by the double process of filtration—upward in the cultivation tank and downward through the series of trays.

The principal features of the cultivation tank are shown in fig. 100. The sewage flows from the inlet-drain A into a square settling chamber B, from which it passes to the space C in the bottom of the tank and rises through the grating D and the filtering material E to the overflows F. The effluent passes along the side channels G to the second portion of the apparatus, which may consist of a series of trays (constructed of wood, iron, or concrete) as shown in fig. 101, or of one or more filter-beds as shown in fig. 102. At Caterham a second chamber was constructed for experimental purposes between the cultivation-bed and the filtering trays. The trays are about 7 in. or 8 in. deep, filled with fine coke or other material and with 3 in. space between. The sand and small quantity of sludge, collecting in the bottom of the tank and settling chamber, are at Caterham carried to a lower level of the ground by means of a pipe fitted with a penstock, which is raised for about five seconds daily.

The amount of sludge proper is, however, very small, where storm water is excluded. At Ashtead the filter-bed is emptied only three or four times a year, and the whole of the sludge for over six years has been received by a plot of ground only 3 yards square without nuisance.

Mr. Scott Moncrieff's system consists, it will be observed, of a double process of filtration, the first being upward and principally anaërobic, and the second being downward and aërobic. It differs from Mr. Donald Cameron's "Septic Tank" system, in providing flints or other filtering material in the anaërobic tank. Mr. Scott Moncrieff claims that this filtering material becomes covered with bacteria, and thus makes all the difference "between a nomadic and a fixed population." The septic tank, however, soon develops a surface-growth or scum, which furnishes a suitable nidus for bacteria, and in practice it liquefies a large part of the organic solids in the sewage, exactly in the same manner as Mr. Scott Moncrieff's cultivation tank. It was at one time thought that the septic tank must be covered in order to exclude the air as much as possible, but the experiments at Manchester and elsewhere have shown that an open tank gives equally good results; the scum which forms on the surface affords ample protection. Open tanks of this kind are now often known as "scum-tanks."

The inlet and outlet should dip well below the surface of the sewage in the tank, so that the scum will not be disturbed or carried through the overflow. The capacity of the tank should be about equal to a day's flow of sewage. In plan it may be oblong, square, or circular, but the oblong form is usually preferred, as the flow of the sewage is more equable. If a circular tank is used, the inlet pipe should be carried down the centre to about two-thirds of the depth, and may have a bell-shaped end. Outlets may be formed around the circumference of the tank about a foot below the surface of the sewage, and may communicate with an annular channel in which the overflow pipes leading to the filter-beds are fixed, the inverts being level with the surface of the sewage in the tank.

The flow through the tank is continuous, but the slow rate allows time for the liquefaction of the greater part of the organic solids, and for the deposition in the form of sludge of the small portion of insoluble residue. Part of the soluble matter is also sedimented, and is acted upon by the bacteria in the sludge. Light matters float to the top and are entangled in the scum and there reduced by bacteria. Soapy and fatty and other matters, which are not easily dealt with, are in this way retained for a longer period than would otherwise be the case. The tank also equalises the composition of the sewage, which, as we have seen, varies very considerably at different hours of the day. The bacterial changes are accompanied by a constant evolution of gases.

The effluent from a septic tank or scum tank is far from pure, but it is in a state very suitable for treatment on land in one of the three ways already described, or for artificial filtration. The second portion of the purifying process is, however, more difficult than the first, and many different kinds of filters and filtering materials have been tried with varying degrees of success. Nearly all filters fall into one of two classes:—(1) Contact-beds, and (2), percolating or continuous filters. In the first class, the sewage is allowed to run into a watertight bed containing coke and other filtering material; when the bed is full, a period of rest is allowed, after which the sewage is slowly drawn off. A period of rest is then given to the empty bed, so that the filtering material will be thoroughly aërated. While one bed is resting full, emptying, and resting empty, the tank effluent is stored or diverted into another bed. An eight-hour cycle is often adopted in working a contact bed, divided (approximately) thus:—filling, one hour; resting full, two hours; emptying, one hour; resting empty, four hours. It has, however, been shown at Manchester and other places that better results are obtained by adopting double or treble contact with shorter cycles. The first bed is usually filled with rather coarser material than the other, and is known as the primary or coarse bed, the second being called the secondary or fine bed. The liquid capacity of a filter bed (after settlement) is about one-third the total capacity, but the proportion varies according to the size and regularity of the pieces, and is often seriously affected by the retention of solid matters, if the sewage has not been subjected to a thorough preliminary treatment.

In the Sutton or Dibdin system, which was devised and experimented on at Barking by Mr. W. J. Dibdin and subsequently adopted at Sutton in Surrey, the sewage was originally merely screened, and then conveyed to a primary contact-bed, which is chiefly anaërobic in action, and passes thence to a finer secondary contact-bed. A certain amount of sludge collected on the surface and in the interstices of the coarse bed, and the capacity and purifying power were thereby reduced. Preliminary tank-treatment was therefore introduced, and the system has now worked well for some years. The discharge of the sewage is automatically effected by means of Mr. S. H. Adams's siphons (manufactured by the Adams's Patent Sewage-lift Co.), which are in the main on the same lines as those shown in fig. 103, but much larger. The experiments at Leeds with crude sewage showed that the liquid capacity of the coarse bed was reduced to about one-fourth of the gross capacity in less than four months; other experiments with sewage which had been screened and then sedimented for one hour, gave better results, but showed that the safe limit of purification was about eighty gallons per square yard per day, only two fillings per day being treated.

Fig. 103 shows a plan and longitudinal section of an installation consisting of scum tank, two primary beds, and one secondary bed, the progress of the sewage being automatically controlled by means of Mr. S. H. Adams's patent siphons. The sewage first enters the scum tank A, which is fitted with a dipped inlet and outlet, and passes thence continuously to the chamber B, in which two alternating siphons are placed. The liquid from B is first discharged by the siphon No. 1 to the primary bed, C No. 1, where it is held up till the timed siphon, D No. 1, is brought into action by the filling of the chamber through the regulated stop-cock. The length of contact can thus be regulated to give the most satisfactory results according to the nature of the sewage. From the siphon D No. 1 the sewage passes to the secondary bed E, from which it is discharged after a period of contact by the timed syphon F. In the meantime the chamber B has refilled and discharged its contents through the siphon B No. 2 to the primary bed C No. 2, from which it passes (after a period of contact) through the siphon D No. 2 to the secondary bed. Screens are shown at G to prevent the filtering material being carried forward by the siphons. The whole of the work is carried out automatically, and ample periods of aëration are allowed for the beds. The volume discharged from the chamber B must, of course, equal the capacity of the bed to which it is delivered.

Dr. Barwise recommends a triple process of purification:—*First*, anaërobic treatment in a scum tank; *second*, lateral filtration (anaërobic) through a coarse bed; *third*, aërobic filtration through a percolating filter.

No hard-and-fast rule can be laid down as to the areas of contact-beds. At Sutton the coarse beds deal with screened sewage at the rate of about 100 gallons per square yard per day, and the fine beds deal with the effluent from the primary beds at a rate 50 per cent. in excess of this. The beds are 3 ft. 6 in. deep. Deeper beds are sometimes used, but the usual range is from 3 ft. to 5 ft. Sometimes the liquid capacity of the primary beds is equal to the daily flow of sewage; the gross capacity will therefore be about three times as great. The same rule is also applied to the secondary beds. But smaller beds will suffice if storm-water is excluded from the drains, and if the sewage is passed through a scum tank of proper size. It has been estimated that, with beds 4 ft. deep, not more than 112 gallons of screened sewage can be purified per square yard per day, but that, if the sewage is first treated in a scum tank, 150 gallons can be treated at two fillings a day, or 225 gallons at three fillings. Open-jointed drain-pipes should be laid along the bottom of the beds to facilitate the emptying and aëration, and the sewage should be distributed over the surface, a common method being to lay channels along the top of the beds, the sewage overflowing on both sides.

Coke has been very largely used for filter beds, on account of its porosity, and appears, on the whole, to give as good results as any other material; but coal, burnt clay ballast, broken stones, &c., have been used. The three experts at Manchester came to the conclusion that clinkers passed through a screen with 1½-in. meshes and rejected by one with ½-in. meshes are the most satisfactory. At the Hampton sewage-works, probably the best example of treble contact, no preliminary tank-treatment was adopted, and the primary bed soon began to show signs of sludging up; the primary or coarse bed is filled with clinker rejected by ½-in. mesh; the second, with clinker passed by ½-in. mesh and freed from dust; and the third, with "finer material which might be called clinker-sand." Primary beds for screened sewage are often made with still coarser material, the pieces being sometimes from 3 in. to 5 in. in diameter.

Percolating filters are now being adopted for the oxidation of the effluents from scum tanks or from primary contact beds. They are continuous in action, and if the sewage is properly distributed, a more rapid rate of filtration can be adopted. The Candy-Caink sprinkler is an apparatus for this purpose. The bed must be circular or polygonal in plan, and the sprinkler must be fixed on a standard in the centre. The sprinkler consists of two long perforated arms, and is so designed that the arms, actuated by the flow of the sewage, revolve horizontally around the central standard, and distribute the sewage in fine streams over the surface of the bed. Adams's patent "York" Buoyant Distributor has revolving arms, and as it is almost entirely frictionless, will work under a very low head. Its weight is supported by the liquid in a central tank, upon which the entire apparatus floats. The latest experiments with this type of filter have been carried out by Mr. Alfred Creer, City Engineer, York, at the Naburn Sewage Works, and fully demonstrate the value of the continuous treatment under suitable conditions Mr. F. Wallis Stoddart's distributor (fig. 104) has the advantage of being without moving parts. It consists of a number of narrow V-shaped gutters, placed above the top of the filter, as shown in fig. 105, and supported at the ends and by intermediate steel joists if necessary. The gutters must not rest on the filter, as the inevitable settlement of the filtering material would in that case throw the gutters out of level and so cause the sewage to be distributed unevenly. The sewage enters the channel at A, and, passing into the distributors B, overflows at the triangular notches (shown at the ridges in fig. 104), flows down the house sides of the corrugations, and drips from the projecting points, of which there are 300 in each square yard. The filter is continuous in action, and can be built with enclosing walls as shown, or with coarse rubble sides and foot, or the sides may be formed with the filtering material laid to its natural slope. If open sides are adopted, brick piers must be erected to support the joists which carry the distributors. In any case, the effluent escapes into an open channel formed around three sides of the filter. The inventor claims that this filter, with a depth of 6 ft., will purify from 500 to 1,000 gallons of tank effluent per square yard per day, according to the strength of the sewage, but these figures appear to be based on a purification of only 70 per cent., which is not always sufficient.

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There is a growing belief that percolating filters are better than contact-beds for the oxidization stage of purification. In contact-beds the air is expelled by the sewage, and prolonged contact may hinder the work of the aërobic organisms. In any case, the beds must be worked intermittently, involving additional labour or somewhat expensive automatic apparatus. In percolating filters, on the other hand, air is drawn down with the sewage and freely aspirated through the open sides.

It is impossible in the space at our disposal to describe all the different kinds of filters (as distinguished from contact-beds), which are in use. The general aim of the designers has been to improve the aëration and to increase the purifying capacity. Mention may be made of Colonel Ducat's, which has open sides found with drain-pipes sloping downwards and inwards, and which is provided with heating pipes to raise the temperature in winter—Lowcock's, which is fitted with air-pipes through which air is forced at a low pressure—and the Whittaker-Bryant "Thermal Aërobic Filter," which has open brickwork sides, a revolving sprinkler, and a steam-jet for raising the temperature of the sewage before it is distributed over the filter. In the last the filtering material is 9 ft. deep, and the action is continuous.

GENERAL BUILDING NEWS.

ST. JOHN THE EVANGELIST CHURCH, OXFORD.—Some days ago Lord Halifax laid the foundation-stone of the tower of the Church of St. John the Evangelist, at Cowley, Oxford. The church, dedicated in 1896, was built after the designs and plans of Mr. G. F. Bodley, the estimated cost of the entire fabric, including a mission house, being about 12,000*l.* The building of the tower, at a computed outlay of 3,000*l.*, was deferred for a while, as the necessary sum for the whole structure was not at once available. We published two views of the church in our issue of July 1, 1899.

ROMAN CATHOLIC CHURCH, STANLEY, DURHAM.—The Roman Catholic Church of St. Joseph and the Sacred Heart, which has been erected at Stanley, at a cost of 7,000*l.*, was opened on the 19th inst. Mr. Charles Walker, of Newcastle, was the architect, and the building is of Early English style, built in Heworth and local stone, with vaulted pitch pine roof. The plastering, which is of an ornamental character, was done by Messrs. Rule, of Sunderland. The building is heated by hot water, the apparatus having been placed therein by Messrs Dilworth & Carr, of Preston, and the electrical work is by Messrs. Carrich & Co., Gateshead. The terrazo pavement is the work of Messrs. Geary & Walker, and the oakwork, including the front of the choir gallery and the doorways, was done by workmen from Belgium. The oak carving on the communion rail was executed by Messrs. Plaskett, of Carlisle. The stained-glass work was executed by three firms, Messrs. Mayer, of Munich; Barnett, of Leith; and Atkinson, of Newcastle. The columns are of red sandstone from Galloway. The tiling was done by Messrs. Wedgewood & Sons, of Stoke, and the wood blocking by Mr. Roger Low, Bolton. The chief contractors were:—Building, Mr. W. Johnson, of Stanley; joiner's work, Mr. T. Mordue, of Dipton; painting, Mr. S. Swallow, of Stanley; plumbing, Mr. L. Urwin, Shotley Bridge; and seating, Mr. Plaskett, of Carlisle.

RECONSTRUCTION OF ABERDEEN MUNICIPAL BUILDINGS.—The Finance Committee of Aberdeen Town Council, at a meeting on the 18th inst., had under consideration the remit from the Council to take steps for the alteration and rearrangement internally of the wing of the Municipal Buildings fronting Broad-street and Concert-court, at a probable cost of 3,000*l.* to 4,000*l.*, with a view to providing additional accommodation for the different Corporation offices and departments. It was decided to ask Mr. Dyack, Burgh Surveyor, to go into the matter, with Lord Provost Fleming, Treasurer Bisset, Mr. Gordon, Town Clerk, and Mr. Cran, the City Chamberlain.

HOTEL, STROMNESS.—A new hotel has recently been opened at Stromness, opposite the public steamboat pier. The building contains a large coffee-room capable of seating ninety persons, a large commercial-room, several private sitting-rooms, two smoking-rooms, large billiard-room, four bathrooms fitted with hot, cold, spray, and plunge baths, ladies' cloakroom, gentlemen's lavatory, and upwards of forty bedrooms. The hotel is lighted throughout by electricity supplied by a private dynamo, and the corridors are heated by hot-water pipes. The bedrooms are connected with the office by telephone. Mr. Samuel Baikie, of Stromness, was the architect.

CONGREGATIONAL CHURCH, SMALL HEATH, BIRMINGHAM.—The foundation-stones of a new Congregational church were laid on the 16th inst. at Small Heath. The site is situate at the corner of Watery-lane and St. Andrew's-road, and adjoins the present Congregational school buildings. When furnished the new edifice will cost about 3,000*l.* It will be erected in red brick with stone dressings, and will provide seating accommodation for between 400 and 500 persons. Mr. Elvin, of Birmingham, is the builder, and Mr. Reynolds, of the same city, the architect.

NEW SCHOOL BUILDINGS, FELSTED.—The foundation-stone of these buildings was laid by General Sir Alfred Gaselee on the 19th inst. They will consist of a large school and eight classrooms, of which the classrooms are nearly completed. The new block was designed by Sir Arthur Blomfield & Sons, the builders being Messrs. Hunt, of Hoddesdon.

CHURCH EXTENSION, MANCHESTER DISTRICT.—At a meeting of the Hulme Rural Deanery, held on the 16th inst., the Local Hon. Secretary presented the statement of the Diocesan Loan Fund, the object of which is to provide churches where they are needed and to erect and enlarge elementary schools. Last year, it was computed, forty-one new churches were needed in the diocese, and a similar number of new mission-rooms; whilst twenty parishes require new schools, or the existing schools should be enlarged and improved. The amount received to date is upwards of 8,000*l.*, of which the Hulme Rural Deanery has contributed 220*l.* The following loans have been made: St. George, Abbey Hey, Gorton, for the erection of church, 800*l.*; St. Martin, Norris Bank, for erection of church, 500*l.*; St. Anne, Lydgate, for site and mission-room, 350*l.*; St Philip, Bolton, for site for church, school, &c., 800*l.*; St. Barnabas, Bolton, for site, 800*l.*; St. Peter, Oldham, for rebuilding church, 500*l.*; Parish Church, Lytham and Fairhaven, for erection of church, 800*l.*—*Manchester Courier.*

HOSPITAL, OAKWELL, BATLEY.—At a recent meeting of the Oakwell Joint Hospital Board it was agreed to erect a hospital for infectious diseases at a cost of about 10,000*l.*, including the expense of the site, &c. The buildings to be erected are as follow: Administration block, scarlet-fever pavilion, typhoid-fever pavilion, half the isolation pavilion, laundry block, mortuary block, and discharge block. In the basement of the administration block will be a spacious larder and coal-cellar; while the ground floor will contain the matron's and doctors' room, dispensary, matron's store, nurses dining and sitting room, lavatory and water-closet, kitchen, scullery, housemaid's pantry, cook's pantry, caretaker's living room (with separate entrance porch), caretaker's bedroom, and front entrance, also separate entrances for the nurses and tradesmen. Wide corridors and staircase are also provided. On the first floor will be the matron's and servants' bedrooms, six bedrooms for the accommodation of nurses and probationers, two linen stores, bathroom, &c., and housemaid's sink closet. There will be a spacious yard at the rear, with the necessary outbuildings. The scarlet-fever pavilion, typhoid-fever pavilion, and the half-isolation pavilion, one-storied buildings, will each contain two wards. Accommodation will also be provided in each of the scarlet-fever wards for eight beds; in each of the typhoid-fever wards for four beds, and in each of the isolation wards for one bed, together with the nurses' duty-rooms, provision-store, linen-store, bathroom, and other conveniences in connexion with each department. The laundry-block will consist of wash-house, finishing and ironing-rooms, boiler-house, stable and hay loft, ambulance shed, infected and disinfected van sheds, two washing yards, and outbuildings. A steam disinfector is to be placed between two rooms, with a basement for a calorifier. The mortuary will contain two slabs, lavatory, sink, &c., annexed to which will be a visitors' lobby, separated from the mortuary by an air-tight glazed screen, and entered by a separate external door. The discharge block contains undressing-room, bathroom, and dressing-room, and is placed near the main entrance. The whole of the buildings are to be erected in brick, with stone dressings, and the roofs are to be covered with dark blue Westmoreland slates. All the floors of the wards are to be laid with polished maple, and the walls of the pavilion finished inside with parian cement plaster, all the salient internal angles being rounded. The woodwork in the pavilions will be of pitch pine, and the wards will be ventilated by means of extract ventilators placed on the roofs, and up-cast inlet ventilators on the walls. For the heating of the wards, Shorland's hospital stoves are being introduced, the hot water for the baths and sinks will be obtained from the calorifier in the laundry block, heated by steam from a large Cornish boiler. Over the boiler-house will be placed a large water cistern to supply the water to the calorifier at a sufficient pressure to reach the pavilions. Two systems of drainage will be provided, one for surface-water and the other for sewage. By gravitation the sewage will be conducted to two pairs of bacteria beds, which are to be used alternately. These beds will be fitted with Adams's patent automatic alternating siphons for emptying and filling, thus requiring little or no attention. Before reaching the bacteria beds, the sewage passes into a scum-tank, and after bacteriological treatment in the beds, the effluent is conducted over a prepared irrigation area of about a quarter of an acre in extent. Each section of drains is to be ventilated with an inlet and exhaust ventilator, and automatic flushing siphons are to be employed. The following are the different contractors for the work:—For excavating, drainage, masonry, brickwork, &c., Messrs. W. & H. Sykes, Morley; carpenters and joiners' work, Messrs. Martin Willans & Son, Birstall; plumbing, glazing, &c., Messrs. E. Walker & Co., Heckmondwike; slating, Mr. Jonas Thornton's Sons, Heckmondwike; plastering, Messrs. William Parker & Sons, Heckmondwike; painting, Mr. Tom Batty, Drighlington. Mr. J. W. Burrows, of Birstall and Mirfield, is the architect.

WESLEYAN CHAPEL, BISHOP'S STORTFORD.—The foundation stones of this new edifice were laid on the 11th inst. The building will be of red brick with stone facings. It will have seating accommodation for a congregation of about 520, and the cost of the site and building is estimated at about 4,835*l.* To this has to be added approximately another 800*l.* for the school, which it is hoped to build later, making the total estimated cost about 5,635*l.* The architects are Messrs. Gordon & Gunton, of London, and the contractor is Mr. Feast, of Haddenham, Cambs.

NEW CHURCH, BLACKWALL.—On the 21st inst. the Bishop of Rochester consecrated the new church of St. Andrew with St. Michael, which has been erected on a site given thirty-five years ago by Morden College, Blackheath, in Greenwich Marshes, near the opening of Blackwall Tunnel. The church has been built at a cost of 15,000*l.*, from the designs of Mr. Basil Champneys, and in style is Late Gothic. It is of brick, with white stone supporting pillars. The seats are of pine, the choir stalls and altar rails of oak, of which, too, the lectern, altar rails, &c., are constructed.

PROPOSED FREE LIBRARY, BIDEFORD.—At a meeting of the Bideford Town Council on the 20th inst. the report of the Council respecting the site of the new Free Library, and the rebuilding of the corner premises, occupied by Messrs. Hogg & Pridham, was presented. It recommended that—

(1) The architecture of the buildings should be in conformity with the present Town Hall; (2) the Free Library should be a distinctive building; (3) a Council Chamber should be provided about 30 ft. by 25 ft., with communication with the present Town Hall, and an anteroom; (4) a suite of offices should be on the ground floor at Hogg's corner; (5) the Library should have a frontage of 50 ft. adjoining Mr. Giddie's premises; (6) the entire cost of the Library buildings and fittings should not exceed 1,600; (7) the Library should be a one-storied building with galleries, heated with hot-water apparatus in the basement; (8) a bold hall and entrance should be erected to the Library and Municipal Buildings, which are to have lavatory accommodation on the first and ground floors; and (9) that an arbitrator should be selected from the Royal Committee of British Architects to assist the Council in adjudicating upon the plans, for which prizes of 30*l.*, 15*l.*, and 10*l.* are to be offered, the prize money and the successful plan to be merged in the commission when the work is carried out.

The report was adopted unanimously.

BANKING PREMISES, HOLBORN.—The new buildings of the Birkbeck Bank, now almost completed, which front Holborn, and are adjacent and in striking contrast to Staple Inn, will add an element of variety to the street architecture of London. The Holborn front, however, is treated less decoratively than the portion extending along Southampton-buildings to the back of Staple Inn. The buildings are lofty and cover about an acre of ground, and a new road has been constructed on the eastern side, called Staple Inn-buildings-road. The style is Italian Renaissance. The architect is Mr. T. E. Knightley, of Messrs. Knightley & Batterbury, Cannon-street. In regard to the internal plan, the numerous corridors are all well lighted, and the rooms on the various floors are provided with reflectors of varying dimensions. There are four staircases, from several points of which one can look from the ground floor to the roof, spacious landings, and no division separating one part of the building from the rest, although, as means of safety against fire, isolation is made easy by a number of iron doors. The principal entrance is from Southampton-buildings, and there are two or three other entrances which lead through the building. The bank itself is a circular-domed room, considerably larger than the main room in the Bank of England. Its diameter is 72 ft., and its height about the same. Outside the counters is a space 10 ft. wide, floored with indiarubber, and seats and tables for customers. There is also a writing-room, a waiting-hall, a room for opening new accounts, and board-room. Around the dome is a gallery in which the Land and Building Societies' business is carried on. Beneath the floor and extending over the strong-room below are semicircular iron arches, not quite reaching the sides, so as to obviate any thrust of the arches. There are many strong-rooms and safes provided for customers and others who may wish to rent them from the bank. There is a well, of which the water has been analysed by Professor Attwood, and pronounced to be pure and soft. There are plenty of lifts, and the electric light is generated on the premises. The heating of the corridors is by steam radiators, and the heating and ventilation are by Blackman. The building is throughout fire resisting, and, internally as well as externally, the walls are faced with salt-glazed terra-cotta. In respect of decoration there are outside on the east and south busts of distinguished men—some of whom, as William Hazlitt, who lived on the spot, bring local associations. Around the dome are sixteen compartments of fresco, each containing a subject suggestive of the

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business of banking. The contractor is Mr. Charles Wall; the terra-cotta work by Messrs. Doulton; and a portion of the tiling by Messrs. Boote & Co.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, KINGSBRIDGE, DEVON. — A Local Government Board inquiry was held at Kingsbridge on the 17th inst. relative to the application by the Urban District Council for sanction to carry out the water supply augmentation scheme. Mr. Edward Windeatt (Totnes), who appeared on behalf of the Council, said the loan required would be 3,100*l.*, to be spread over as long a term as possible. The population of the district at the last census was 3,011, and the outstanding loans about 1,500*l.* The assessable rateable value was 10,201*l.* Mr. W. G. Ussher, geological expert, said the source of the water on West Alvington Hill was deep-seated, and there was little chance of pollution.

WATER SUPPLY, TUNBRIDGE WELLS.—Tunbridge Wells obtains its water from a large number of deeply-seated springs in the neighbouring country some miles eastwards of the borough boundary, and these sources are augmented by means of a further supply obtained from artesian wells sunk several hundred feet into the water-bearing beds known as the Ashdown sands. Each spring-head has for some time past been made secure by means of a solid brick chamber, at the bottom of which the spring issues. These waters are collected over a wide area and conveyed in iron pipes to the Corporation reservoir and pumping-station at Pembury. With regard to the deep-well or artesian waters, these, lying as they do at a depth of from 300 ft. to 400 ft. below the surface, have been obtained by the Corporation at a considerable cost. The stratum from which the water is obtained has been proved by means of boring operations to be at least 150 ft. in thickness, and is in all probability considerably thicker. Its outcrop is some miles from the borings, so that the rainfall reaching the water-bearing beds necessarily percolates through a very considerable thickness of the Ashdown sands, thus ensuring a high standard of purity. When boring, the water was reached after passing through a bed of Wadhurst clay some 200 ft. in thickness, thus excluding surface waters. We understand that a trace of iron was found in one of the wells, and which, though in no way whatever detracting from the quality of the water, has upon a few isolated occasions given rise to a temporary discoloration of the supply owing to the iron depositing in the distributing mains, which have in consequence been flushed at frequent intervals. This has now been remedied, as a large area of filter-beds has been laid down in order to remove any trace of iron that may exist. The filter-beds have been made of sufficient area to filter the whole town supply for many years to come. The water is raised from the wells by means of compressed air, which is generated by a pair of compound condensing engines, with double stage air compressors, which have been erected in an engine-house some considerable distance from the wells from which the water is obtained. The compressed air, after having been cooled, is then transmitted through an air-main and conveyed to the bottom of the wells, where it is discharged in a manner so as to raise a large and continuous stream of water to the surface. The water is thereby aërated and passed on to the Corporation reservoirs. The Tunbridge Wells water area is a large one, and extends to a number of districts beyond the borough boundaries, and, in order to amply provide for all possible demands that may be occasioned in the future by the growth of the town, the Corporation are taking in additional springs into their supply and sinking more deep wells some considerable distance away from those already existing.—*Tunbridge Wells Courier.*

STAINED GLASS AND DECORATION.

MEMORIAL TABLET, FORGAN, DUNDEE. — A memorial tablet erected in the chapel of Vicarsford Cemetery, Forgan, Dundee, to commemorate three volunteers who fell in the South African war, was recently unveiled. It is of carved stone, flanked on either side by short pilasters, and surmounted in the centre by an ornate cross. Mr. James Bremner, of Broughty Ferry, was the sculptor.

MEMORIAL TABLET, EDINBURGH.—A memorial table to the late Mr. Robert Wilson has been erected in the hall of the mission building of the Sabbath Free Breakfast Mission in Old Fish Market Close, Edinburgh. Mr. Hippolyte Blanc, architect, of Edinburgh, designed the tablet, which was executed by Mr. Beveridge, sculptor. The memorial is in the form of a mural tablet of Sicilian marble The marble, which is 28 in. high by 21 in. broad, is enclosed in an elliptical-headed frame of carved pilasters and archivolt, the whole being comprised within an entablature, with carved festoon decoration on the frieze. The entablature is supported upon two carved and fluted shafts, resting upon a moulded and bracketed plinth. The framework is of walnut, and the lettering on the marble panel is in gold.

FOREIGN.

FRANCE.—The two travelling scholarships in architecture at the Ecole des Beaux-Arts have been awarded this year to M. Brunet and M. Billerey. The former exhibited at the Old Salon an "analytical elevation of St. Etienne d'Auxerre"; the latter exhibited at the New Salon two designs for churches for a town in Normandy.——Mlle. Marie Pellechet, sister of the eminent architect, has left to the Académie des Inscriptions et Belles-Lettres a sum of 300,000 fr. to found an annual prize in architecture, to be called the "Prix Auguste Pellechet."——The Académie des Beaux-Arts has awarded to M. Bénard, architect, the Jean Reynaud prize, of the value of 10,000 fr., for his design for the University of San Francisco.——M. Espouy, the architect, has just completed the model of a great piece of decoration which is to cover the iron curtain of the Comédie Française. The composition, which is surrounded with a framework of gilt leafage, represents a series of porticoes of clipped tree surrounding the "Altar of Art," towards which advance two figures symbolising Comedy and Drama, and carrying laurels and flowers. Other figures, representing the Scenic Arts, are grouped to right and left, and in the upper part of the space floats a banner carried by flying genii, and bearing the inscription "Præteriti fides, spes futuri."——In the side chapels of the Church of St. Nicolas des Champs some interesting frescoes have been discovered, which have been hidden for more than a century under a coat of plaster. One of these, in the Chapel of Saint Vincent de Paul, is attributed to Simon Vouet.——The new Chamber of Deputies will shortly have under consideration a scheme for some works on a large scale for the improvement of the port of Dieppe.

INDIA.—The Government Press offices are to be lighted by electricity at a cost of 50,000 rupees, and further estimates for lighting St. George's Cathedral, the General Hospital, and Government House, Ootacamund, amounting to about a lakh and a half of rupees, have been submitted for sanction.—— The survey of the Bankura-Howrah railway has been nearly finished.——The Indian Forest Department and the Public Works Department are discussing the problem of more expeditiously moving the timber which accumulates at the Rangoon depot. The timber remains on the river bank for months owing to the narrowness of the creeks. The methods proposed to facilitate the removal are either by deepening the creeks and widening the bridges over them or by erecting a number of jetties on the river bank, each with a steam crane to lift the logs out of the water.——The foundations of the new municipal buildings at Calcutta are about to be laid, and the work is expected to progress rapidly in spite of the difficulties hitherto experienced.——Oil has been used for laying the dust on the roads of Mandalay and has proved to be successful.——The Darjeeling Fine Arts exhibition has been opened by the Lieutenant Governor.—— The reconnaissance survey of the projected Syriam-Pegu railway has been completed.

UNITED STATES. — Mr. Edward Robinson has been elected director of the Boston Museum of Fine Arts in the place of General Charles G. Loring. Mr. Robinson is regarded in the United States as one of the best authorities on classical antiquities.—— We regret to learn of the death of Mr. James Brown Lord, one of the best known of New York architects. He designed many public and private buildings, including the two Delmonico buildings, the White Plains Asylum, the Babies' Hospital, and the new Appellate Court-house, Madison-square, New York.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS —Messrs. Easton & Co. have appointed Messrs. Reunert & Lenz, of Johannesburg and elsewhere, sole agents for the whole of South Africa for the sale of the Schmidt patent superheaters; and throughout the same territory, with the exception of Cape Colony, for Messrs. Easton's electric and hydraulic lifts.—Messrs. Niven & Wigglesworth, architects, have removed their offices from 34, Mecklenburgh-square to Gwydir Chambers, 104, High Holborn, W.C.

THE CLOTH HALL, NEWBURY. — Mr. Francis Mount is appointed architect for the restoration of the Jacobean Cloth Hall at Newbury, and of its conversion for purposes of a museum of local antiquities and of an art gallery, as the townspeople's memorial to Queen Victoria. The estimated cost of the work exceeds 2,000*l.* The ownership of the Cloth Hall was recently acquired by the Mayor and a committee from the Charity Commissioners.

SPITALFIELDS MARKET.—A Select Committee of the House of Lords have ordered to be reported to the House for third reading the Bill promoted by the Corporation of London, and already sanctioned by the House of Commons. The Committee have acceded to an application of the Great Eastern Railway Co. for relief from further liability to make payments (now about 1,600*l.* per annum) to the owners of Spitalfields Market in respect of their being allowed to continue their market at Stratford. The payments have hitherto been made to Mr. Homer, as lessee of the former market. The Corporation have recently completed the purchase of the freehold of Spitalfields Market, and have thus acquired all market rights and franchises subject to Mr. Homer's lease of eighty-four years from 1882. Under the Bill they will proceed to acquire the lessee's interest, either by agreement, or, that failing, by arbitration. The Corporation also undertake to carry out certain widenings of the streets, together with other improvements of the property, in and about the area of the market. The Bill enables the Stepney Borough Council to purchase the market after a lapse of ten years, if they wish to do so. The Committee over-ruled some objections raised by the London County Council, who contended that they themselves, and not the Corporation, are the proper Authority for all street improvements so comprehensive in their nature as those contemplated by the Corporation, and that the Corporation ought not to be a "Market Authority" outside the boundaries of the City of London.

UNIVERSITY CLUB, NEW YORK. — One of the most luxurious clubhouses built in New York during recent years is that of the University Club. The building occupies an area of 105 ft. by 155 ft. on Fifth-avenue, and the mechanical equipment is particularly worthy of notice. Steam is furnished by three Babcock-Wilcox boilers, two of 150 h.p. each, and one of 200 h.p., to which fuel is brought from the coal store by cars passing under the main floor. Feed-water is filtered and heated in a 500 h.p. Berryman heater. The steam main of 8 in. diameter serves electric-light engines, pumps, air compressors, blowing engines, Turkish baths, and the heating mains. The electric-light plant includes three Westinghouse dynamos of 75, 50, and 25 kilowatts capacity, direct coupled to high-speed engines of 120, 80, and 40 h.p. respectively. In addition to the lighting mains, leads are taken from the switchboard to various motors for ventilating fans, and the roof garden is illuminated from a separate feeder. An artesian well has been sunk on the premises, so that water at reasonably low temperature may be obtained during summer time. Drinking water is further cooled by the aid of refrigerating plant, consisting of two 12-ton absorption ice machines. For house and boiler services the city water is used, being treated in mechanical filtration plant, with a total capacity of 18,000 gallons per hour. Well water is used for the plunge of the Turkish bath, and is first pumped to two settling tanks of 7,000 and 5,000 gallons capacity, where aëration aids the deposition of ferric carbonate. The water is afterwards passed through a special filter, with a capacity of 2,500 gallons per hour, and, as a result of the treatment, it is said that the water in the plunge is so clear that a pin can be distinctly seen at the bottom through 6 ft. of water. Ventilation is chiefly effected upon the plenum system, by which warm or cold air is distributed throughout the building, according to the outside temperature. Some parts of the house are warmed by exhaust steam; hot water is supplied throughout from high and low pressure tanks; and on the rear section of the roof there is a very complete laundry, in which the machinery is driven by an electric motor. The details of the Turkish bath are of considerable interest, and the plunge is of ample size, measuring 17 ft. by 50 ft., with a depth varying from 5 ft. to 7 ft. 6 in. Passenger and goods lifts, all worked by hydraulic power, complete the main features of the plant, which is remarkably comprehensive and well designed.

THE VIEW FROM RICHMOND HILL.—Mr. Max Waechter, of Richmond, recently purchased from the family of the late Mrs. Metchim, of Petersham Lodge, a portion of that property, and has entered into covenants with the owner, Lord Desart, of the remainder, whereunder he will shortly possess the freehold of the property. Subject to the conditions of a lease which he is about to grant at a nominal rent to the Princess of Wales's Holiday Home for Governesses, and subject to stipulations for the preservation of the fine trees upon the estate, as well as to certain building restrictions, Mr. Waechter has decided to offer the freehold to the town of Richmond in order to prevent encroachments that would mar the prospect from Richmond Hill. Contributions towards the purchase money (72,000*l.*) for the Marble Hill Estate have been made by the London County Council, 36,000*l.*; Surrey County Council, 10,000*l.*; Richmond Corporation, 10,000*l.*; Twickenham U.D.C., 6,000*l.*; Mr. P. Morgan, 1,000*l.*; "Anonymous," 5,000*l.*; and others. As the Middlesex County Council have now agreed to subscribe 2,000*l.*, the acquisition of the estate is virtually assured.

MACHINERY USERS' ASSOCIATION.—The annual general meeting of the Machinery Users' Association was held on Thursday, the 19th instant, at the Westminster Palace Hotel. Sir W. H. Houldsworth, Bart., M.P., presided, and in moving the adoption of the report and accounts referred to the improved position in which the Association stood owing to the Report of the Royal Commission on Local Taxation, and of the recent judgment of the Lord Chief Justice in the case of Crockett and Jones and the Northampton Union Assessment Committee. A recent decision in Scotland, adverse to the manufacturers, had brought a great amount of Scotch support to the Association. Mr. Lewis Evans referred to the question of water supplies as being a most important one for manufacturers. Mr.

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W. H. Holland, M.P., spoke with approval of the formation of the Commercial Committee in Parliament.

INCORPORATED CHURCH BUILDING SOCIETY.—This Society held its usual monthly meeting on Thursday, the 19th inst., at the Society's house, 7, Dean's-yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz.; Building new churches at Weston-super-Mare, All Saints, 240*l.* in lieu of former grant of 200*l.*; Blackham, All Saints, in the parish of Withyam, near Tunbridge Wells, 40*l.*; Fulham, Christ Church, Middlesex, 100*l.*; and Goodmayes, St. Paul, in the parish of Chadwell Heath, Essex, 40*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Godney, Holy Trinity, near Wells, Somerset, 25*l.*; Hemblington, All Saints near Norwich, 30*l.*; North Stoke, St. Mary, near Wallingford, Oxon, 25*l.*; Princetown, St. Michael, Devon, 60*l.*; Saltfleetby, All Saints, near Louth, Lincs., 10*l.*; and Snargate, St. Dunstan, near Folkestone, 15*l.* A grant was also made from the special Mission Buildings Fund towards building a mission church in the parish of Weaste, near Manchester, 40*l.* The following grants were also paid for works completed:—Goole, St. Paul, Yorks, 60*l.* on account of a grant of 100*l.*; Mexborough, St. George, Rotherham, Yorks, 50*l.*; Clapham, St. Peter, Surrey, 70*l.*; and Peterborough, St. Barnabas, 130*l.* In addition to this the sum of 202*l.* was paid towards the repairs of twelve churches from Trust Funds held by the Society.

THE BUILDING TRADES EXHIBITION.—The next Building Trades Exhibition will open at the Royal Agricultural Hall on Saturday, June 13, 1903, and will close on Saturday, June 20. The main portion of the ground floor has already been allotted, so that immediate application should be made by intending exhibitors. It is also intended to hold a Colliery Exhibition to immediately follow the Building Trades.

THE WHITECHAPEL AND BOW RAILWAY.—The new line which has just been opened was constructed jointly by the Metropolitan, District, and the London, Tilbury, and Southend Railway Companies as a link between their lines at Whitechapel Station and Campbell-road, Bow, respectively. Though not much more than two miles in length, it has cost about 1,200,000*l.*, having been constructed for nearly the whole distance beneath the main road on the "cut and cover" system, whilst provision had to be made for a temporary diversion with continuance of the existing tramway and railway traffic during the course of the works. In taking up the roadway two or three miles of old sewers were cut out and replaced with new ones of brick and concrete laid down on each side of the line. Two miles of gas and water pipes have also been laid, some of the new pipes being 3 ft. in diameter. The contractors for the line, which is probably the last to be built in London by the old mode of underground construction, were Messrs. Price & Reeves, of Westminster. The engineer was Mr. Cuthbert A. Brereton, M.Inst.C.E., a partner of Sir John Wolfe Barry. For 50 yards beneath the Regent's Canal the line runs in two cast-iron tubes, 18 ft. in diameter apiece, as in that portion there was not head-room enough beneath the canal for a tunnel of brickwork. At Bow-road station the roadway was lifted bodily 2 ft. to afford head-room for building the station, and was dropped again when the underground work had been finished, and beyond that station, at the junction with the Tilbury main line, an old bridge which carries the latter across Campbell-road was taken down and replaced with a new one for the junction lines without interruption of the railway traffic of that company. Each of the three intermediate stations—at Stepney-green, Mile End, and Bow-road—has platforms 450 ft. long and 16 ft. wide.

THE BUILDING TRADE IN POLAND.—Mr. Consul-General Murray, in his annual report from Warsaw to the British Foreign Office on the commerce of Poland and Lithuania, remarks that the continuance of the financial crisis during the past year was felt strongly in the building trade. Very few new buildings, either public or private, were started in 1901, and, in consequence, the prices of the different building materials, if not kept up artificially by rings and syndicates, were subject to a further fall. Nearly all brickfields which had closed in 1900 remained closed in 1901. Owing to this, however, the stock was considerably reduced, and the prices paid for ordinary bricks in 1900—1*l.* per 1,000—went up towards the end of the year to 1*l.* 7*s.*, a further advance being anticipated in the present year. Locally made refractory bricks are gradually beginning to compete with the British, German, and Belgian articles; their quality is decidedly inferior, but they are so very much cheaper, on account of the duty on imported bricks (which is equal to their value), that it is frequently better to use them. Tiles, which have become extremely fashionable for paving purposes, did fairly well in 1901. Although tiles made locally are inferior to those imported, they have succeeded in completely throwing out the French and Belgian articles on account of their lower price; there does not, therefore, appear to be any opening for British tiles in Poland. The most important works in this line paid last year a dividend of 8 per cent. The demand for cement was considerably smaller than in 1900, owing to the complete standstill in Government works, Government being the chief consumer of cement. The nine cement works in Poland, with a producing power of 1,300,000 barrels of 160 kilos each, sold in 1901 only 560,000 barrels, or 43 per cent.; owing to the syndicate the price was maintained at three roubles per barrel, but this price barely sufficed to cover expenses, so that the balance-sheets for 1901 of the cement works do not show any profit. Very little foreign cement is imported into Poland, but owing to the over-production in the whole Empire, a petition has been presented by the owners of works to still further raise the duty on imported cement. It is doubtful whether the request will meet with the approval of the authorities as regards cement imported by the land frontiers, but it is expected that the duty on cement imported by sea will be increased, which would nearly shut out British cement, of which a certain quantity is still imported.

GARDEN CITIES.—We understand that Mr. George Cadbury has offered to subscribe 1,000*l* to the Garden City Pioneer Company, on condition that the whole capital of 20,000*l.* is raised. In connexion with the movement a great public conference is to be held at Liverpool and Port Sunlight on July 25 and 26, when Messrs. Lever will entertain about a thousand delegates from all parts of the country. Special travelling arrangements are being made for the London delegates and members, and tickets should be applied for to the Secretary, 77, Chancery-lane, W.C.

STREET IMPROVEMENTS, GLASGOW.—The Glasgow City Improvements Committee have had before them a sketch plan and Report prepared by Mr. Frank Burnet, architect for the buildings about to be erected on the east side of High-street, north of Duke-street, with reference to the desire expressed by the Statute Labour Committee of the Police Department to have that portion of the street widened to a greater extent than the 55 ft. already approved of by the Corporation. The sketch plan shows a proposed additional widening to the extent of 4 ft. in the centre, and diminishing to about 2 ft. or 2 ft. 6 in. at the respective ends, and Mr. Burnet states that the loss to be sustained by the City Improvements Department in the carrying out of this further improvement upon the street will amount to about 800*l.* The Committee recommend that this portion of the High-street be further widened to the extent indicated, provided the Police Department will agree to relieve the City Improvements Department of the loss which will be thereby entailed upon that department.—*Glasgow Herald.*

EXCAVATIONS IN THE FORUM.—Our Rome correspondent telegraphed last night:—Signor Boni, director of the excavations in the Forum, to-day discovered two fresh tombs belonging to a prehistoric necropolis. The discovery places the existence of a necropolis beyond dispute, while the fact that one tomb contains ashes and the other a skeleton raises an interesting question as to the burial customs of the early inhabitants of Rome.—*Times.*

MEMORIAL STATUE, DUMBARTON.—The formal unveiling of the memorial statue of the late Dr. Peter Denny, the well-known shipbuilder of Dumbarton, took place on the 17th inst., the ceremony being performed by Lord Overtoun. The statue funds were raised by public subscription, and the commission to execute the work was given to Mr. Hamo Thornycroft, R.A. The figure is cast in bronze, and stands 10 ft. high, on a Kemnay Aberdeen granite pedestal, 10 ft. 6 in. in height. The eastern and western faces contain panels in relief bronze of engineering and shipbuilding, while the southern panel, facing the town, bears the inscription.

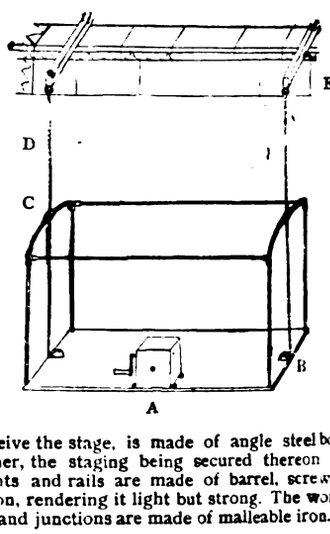
A COSTLY RAILWAY OFFICE.—The new general offices of the Grand Trunk Railway of Canada, at Montreal, were opened on June 2. The building is described as one of the finest of its kind on the American continent. The following particulars are taken from the description of the structure in the local press:—"The building is constructed of Bedford (Indiana) limestone, resting on a base of Quebec granite. The vestibule is composed of four kinds of rare marble; the lower portion being of black and gold marble from Italy, and green marble from Greece; the rose tint marble is from France, and the large panels were brought from the south side of the Pyrenees Mountains in Spain. The three panels between the doors at the head of the steps are of a very rare species of marble from Nubia, Africa. The faience of the vestibule is composed of glazed porcelain, embellished with embossed designs which give the appearance of Italian majolica. The corridor is lined with Belgian marble in large slabs, 8 ft. high, which perfectly match at the joints, and present beautiful designs in variegated shades. This marble is used throughout the building for wainscoting. When it is realised that nearly a million of dollars of capital has been placed in the building, some idea can readily be gained of its general magnificence, and how no expense has been spared to make the building all that any one could desire."

CORONATION ILLUMINATIONS ON THE E.L.B SYSTEM.—The output of illumination material and devices on the E.L.B. system has exceeded, we are told, the most sanguine expectations of the Electric Lighting Board Co. The Office of Works has been using the E.L.B. system for part of the work at Westminster Abbey. The system has been also applied throughout the Stock Exchange, over the façades of the Prudential Insurance Co. and the Gresham Insurance Co.; at the United Service Club, the Conservative Club, and the Devonshire Club. On the Embankment there is an extensive display in the Temple Gardens; and in the West End is a display of the system on the Hippodrome building, another on Messrs. Marshall & Snelgrove's frontages, and another at Messrs. Liberty's in Regent-street. Lloyd's Bank and Martin's Bank are also equipped with this system. Further, there are numerous devices on the E.L.B. system applied to ordinary business premises in the City, in the West End, and also on a number of private residences in Mayfair.

BUILDING MATERIALS FROM BAYONNE.—During the past year, according to an official Report, 1,313 tons of slates were exported from Bayonne by small sailing vessels to Plymouth, Bideford, Ilfracombe, Cork, &c. These slates, which are of a very fine quality, and cut exactly to suit the British demand, are brought to Bayonne by rail from the "Ardoiseries" of Bagneres de Bigorre. As far as can be ascertained, these slates are sold to the British buyers on a cost, insurance, and freight basis. The quantity exported would, no doubt, be considerably increased were it not for the difficulty of finding sailing vessels willing to carry this class of merchandise. The rates of freight to the United Kingdom vary from 8*s.* to 9*s.* per ton. During the year five or six small sailing vessels, carrying altogether about 600 tons of timber for building purposes, were consigned from Bordeaux for Bridgwater.

NEW WESLEYAN CHAPELS AND EXTENSIONS, NORTH OF ENGLAND.—A great impetus is being given to Wesleyan chapel extension in all parts of British Methodism, owing to the anticipated early distribution of grants from the Million Fund. Within the past few days sanction has been given by the General Chapel Committee for the erection of thirty-three new chapels, twenty of which are to be built in populous localities or rural districts where at present Methodism is unrepresented. The estimated outlay on these new chapels is 71,300*l.* The sitting accommodation to be provided is for 10,300 worshippers. With the connexional aid to be afforded, the temporary debt on these new buildings will only be 12,500*l.* In addition there are forty cases of enlargements, also new Sunday and day schools and some ten new organs, bringing up the total estimated outlay to nearly 110,000*l.* In the list are the following cases:—Durham—A new chapel to be built at Brandon, religious services now being held in a cottage. The proposed outlay is 2,105*l.*; sitting accommodation for 280 hearers. Amble—A new chapel to be built at Red Row to seat 225 persons, at an estimated cost of 1,350*l.*; a grant of 300*l.* is asked. Maryport—A new chapel at Wyndham-road to seat 150, at a cost of 720*l.* Cockermouth—A new chapel at Threlkeld Quarry, estimated to cost nearly 1,000*l.*, to seat 110 persons. Also a new chapel at Bleatarn in the Kirby Moorside circuit. In Workington circuit, at Harrington, chapel alterations, &c.; cost 650*l.* At Grange, in Lake District, erection of hall, Sunday-school, &c.; cost 750*l.* Weardale—Chapel alteration at Lanehead; cost 100*l.* North Shields—Enlargement scheme at Rose Hill. Amble—Purchase of day and Sunday-school at a cost of 1,015*l.*; also Broomhill chapel alteration, school, and classrooms, in the same circuit, estimated to cost 925*l.*—*Newcastle Daily Chronicle.*

COPPARD'S SWING SCAFFOLD.—This swing scaffold is invented by Mr. John Coppard, of Caledonian-road. It is raised or lowered by a gearing which can be worked by one man turning the windlass handle shown in connexion with the gear case A. This contains the drum to which one end of cable D is secured, the other end of the cable being passed over rollers in A and through pullies B, and guide stay C, and then secured to cantilevers E, enabling one man to safely do the work usually requiring four or six men. The bed,



to receive the stage, is made of angle steel bolted together, the staging being secured thereon The uprights and rails are made of barrel, screwed in position, rendering it light but strong. The working parts and junctions are made of malleable iron. The

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gear case A, containing the mechanical arrangement, is bolted in position on the flour. Steel cables are employed, the breaking strain of which is 15 cwt., instead of hemp ropes. We have seen a working model of the scaffold and consider it a very useful thing.

FRENCH STONE AND SLATE EXPORTS.—In his annual report on the trade of Cherbourg, Mr. Consul Loftus devotes considerable attention to the stone trade. This, he explains, is carried on by several firms and companies in the district, large quarries existing very close to the docks and wharves, being, in fact, connected to these by steam-tram lines. All these companies seem to be doing well, and undoubtedly this trade is one of the most prosperous in the port. Practically all the stone is carried from the port in small British ships, which come across, in ballast as a rule, expressly for cargoes of stone. This latter is principally used for road-mending purposes, and is broken by hand into cubes varying in size from about 1½ to 2½ in., the application of machinery having been found by experience to be less effective. It is then passed through revolving drums to ensure uniformity of size, the drums being perforated with holes and driven by steam. From these drums it is shot direct into trucks underneath, and run off, either direct to the wharves or to large reserve heaps near by. The stone is shipped principally to Southampton, Newhaven, Shoreham, Dover, Rochester, Fareham, Poole, Strood, Margate, Ramsgate, and the Thames. The quantity exported in 1901 was 120,000 tons, showing an increase of 50,000 tons over the preceding year. Mr. Loftus remarks that the Cherbourg stone "is excellent as a rule, but the British engineers are most particular as to the quality of the stone used by them; and the area over which the cost of carriage allows its sale is limited, being confined to those places near or on the south or south-eastern coasts of the United Kingdom. The average cost of macadam stone here is about 6s. per ton, and that of unbroken stone is, of course, a little less." Mr. Henniker-Major, Vice-Consul at St. Malo, mentions that the export of stone from that port is a new departure. It consists principally of paving stones from Erquy, Côtes du Nord, but included also last year one cargo of granite for Dublin; also 10 tons of granite from "La Société des Granits de l'Ouest," which turns out a stone known as "porphyroide polie inalterable," a splendid stone beautifully polished. Slate, Mr. Henniker-Major adds, is steadily increasing as an export, and is a most useful freight for small sailing vessels, London being the port of destination. This slate is from "Le Compton d'Ardoises d'Anjou," at Auger, Seine et Loire.

ELBA MARBLES AND GRANITES.—We gather from a Report by Mr. Vice-Consul Tonietti that the considerable quantity of limestone (about 30,000 tons) required for the smelting of quartz ores in the Elba furnaces has caused the numerous marble quarries in Elba to be reopened. The working of these will allow of the extraction of more compact blocks than have been previously obtained, and will revive a long abandoned industry. The quarrying is already under way, and the loading stations are in good working order. In the several trenches dug to mark out the lower boundary of the great marble vein traversing Elba for many kilometres from south to north, with an east to west inclination of about 45 deg., yellow and red ochres are found, together with oxides of iron and traces of ore. Beds of coloured earth and oxides of iron promising a good yield have begun to be worked again in other parts of the island. Cipollino marble quarries were opened on the northern side of Elba, on the coast between Portoferraio and Marciana Marina, during the year 1901, and the first blocks of different sizes, some of them measuring from 5 to 7 cubic mètres, were sent abroad. This marble is held to be of a very fine quality on account of its beautiful veinings, and if its special hardness does not constitute a defect, promises well. The granite quarries do not give evidence of any noteworthy progress, apart from the crystals which are now found there more frequently—white, coloured, and tricoloured tourmalines, beryls, aquamarines, feldspars, &c., and some of the unusually large blocks containing hundreds of these crystallisations massed together are indeed marvellous to behold.

ITALIAN MARBLE.—An official report received at the British Foreign Office from Leghorn states that last year the business in marble, both rough and worked, was very favourable to those concerned. The quantity exported was about the same as in 1900, but prices were better for quarry owners. Nearly sixty per cent. of the worked marble of Carrara went to the United Kingdom, while very large quantities of the rough material went to the United States, which prefers to do its own sawing into slabs. The actual quantities exported to British destinations in 1901 were: marble and alabaster, rough and in blocks, 3,334 tons, value 8,193*l.*; marble and alabaster, worked, 7,404 tons, value 73,736*l.*

LEGAL.

WOOD FLOORING COMPANY'S LIBEL ACTION.

THE case of the Acme Wood Flooring Co., Ltd., *v.* Alcot, came before Mr. Justice Wills in the King's Bench Division on the 19th inst., an action by the plaintiff company to recover from the defendant damages for alleged libel. The defendant pleaded that the words complained of were not libellous.

It appeared that the plaintiff company and the defendant both carried on the business of importing and cutting American red gumwood for the purpose of wood pavement, and laying it down when cut into blocks. In the year 1900 the defendant was employed by the Vestry of Bethnal Green to pave two streets known as Abbey-street and Church-row. The defendant carried out the work in Abbey-street, but the work in Church-row was not proceeded with. The Brighton Corporation in January, 1901, invited tenders for the paving of certain streets in Brighton, and the tender of Messrs. Macartney & McElroy for supplying and laying down the wood pavement required was accepted, and it was arranged that the blocks made by the defendant should be employed for that purpose. After the work had proceeded some time it was discovered that the blocks supplied by the defendant were unsatisfactory, and then the Brighton Corporation entered into a contract with the plaintiff company for the supply of the remaining blocks necessary to complete the work. The plaintiffs supplied 700,000 blocks, some of which Macartney & McElroy used for paving St. George's-place, Brighton, which, being 180 ft. wide, required great care so as to prevent an expansion of the wood. On September 14, 1901, Macartney & McElroy laid down the plaintiff company's blocks without their having been "grouted" or tarred, and when a heavy fall of rain occurred the spaces between the blocks became filled with water, and, expansion taking place, the result was the bursting up of the pavement at the side of the road. In October, 1901, the Bethnal Green Borough Council invited tenders for the paving of Church-row, which had not been proceeded with under their contract with the defendant. Both the plaintiff company and the defendant tendered for the work, but the Borough Council accepted the plaintiff company's tender. On October 11 the defendant sent one of the photographs of St. George's-place, which he had taken to the Surveyor of the Bethnal Green Borough Council with a letter which contained the following passage:—"I have no doubt that the Acme Co. know all about gumwood, and first thought about introducing it. I send photo showing gumwood recently laid at Brighton by that company."

After hearing evidence, his Lordship, in summing up, pointed out to the jury that if they thought that the reasonable meaning of the words was that the plaintiffs supplied bad stuff, the words were capable of being a libel upon them in the way of their business.

In the result the jury awarded the plaintiff company 200*l.* damages, and judgment was entered in accordance with the verdict for the plaintiffs, with costs.

Mr. J. Eldon Bankes, K.C., and Mr. George Wallace appeared for the plaintiff company, and Mr. B. F. Williams, K.C., and Mr. J. D. Williams for the defendant. Mr. George Lawrence held a watching brief on behalf of certain interested parties.

CASE UNDER THE LANDS CLAUSES ACT.

THE case of the King *v.* Dixon came before a Divisional Court of the King's Bench, comprised of the Lord Chief Justice, Mr. Justice Darling, and Mr. Justice Channell, on the 23rd inst.

In this case the Great Northern Railway Co. had obtained a rule for a writ of *certiorari* to bring up an inquisition of the Under Sheriff of London with a view to its being quashed on the ground that it was made in excess of jurisdiction. The railway was a tube one, and ran under East-road, Hoxton, No. 105 of which was leased by the respondent, Dr. Dixon. As the line went under a portion of respondent's house, the railway company served notice to treat with regard to the easement they required. The respondent also served a notice of claim asking so much for the easement and so much for damage to his property. Thereupon the company issued a warrant to the Sheriff which only required that official to call a jury to determine the amount of compensation due to Dr. Dixon under the Lands Clauses Act, in respect to his property being injuriously affected by the execution of the Company's works in the course of the construction of the railway. For the railway company it was said, however, that the Under Sheriff took into consideration and allowed evidence to go to the jury in regard to damage caused by the working of the railway by reason of vibration, with the result that the jury awarded Dr. Dixon 230*l.* It was also said that the question of the rights of the lessee for damages for removal of subsoil was raised. Upon these allegations the rule was obtained; but on the other hand, it was now said that the Under Sheriff had acted strictly within the warrant, and only allowed evidence to go to the jury in regard to the house being injuriously affected.

The Lord Chief Justice, in delivering judgment, said it appeared in this case that the Under Sheriff did not direct the jury in the manner complained of, and therefore the rule ought, in his opinion, to be discharged.

Mr. Justice Darling and Mr. Justice Channell concurred, and the rule was accordingly discharged, with costs.

Mr. Clayton showed cause against the rule on behalf of Dr. Dixon; and Mr. Freeman, K.C., and Mr. Rose Innes supported it on behalf of the railway company.

HEAVY DAMAGES FOR BREACH OF CONTRACT TO PURCHASE LAND.

IN the Court of Appeal, composed of Lords Justices Vaughan Williams, Romer, and Mathew, on the 23rd inst., judgment was delivered in the case of the Turnchapel Wharves and Warehouses, Ltd., *v.* Pitts, Son, & King, Ltd., on the appeal of the defendants from a judgment of Mr. Justice Grantham dated June 15, 1901, after trial with a special jury in the King's Bench Division.

In this case the plaintiffs sued the defendants to recover damages for breach of contract to purchase certain land. The defence was that the contract was *ultra vires* the defendant company. As this was the only defence, and was a point of law for the opinion of the judge, it was arranged that the verdict of the jury should be taken as to the amount of damages to which the plaintiffs would be entitled in the event of his lordship deciding in their favour. It appeared that the plaintiffs were a company owning a waterside property at a place called Turnchapel, near Plymouth. At the time of the Peninsular War the property had been used by the Admiralty for the purpose of refitting ships; but since that time the place had resumed its rural character, although there still remained some old works, sheds, and docks on the spot. About the eighties a firm in Plymouth purchased the property from the Government, and held it for several years. They expended money in building a wharf on the frontage, and in 1895 the plaintiff company was formed with a capital of 30,000*l.* to take over these wharves, and by an agreement of March 16, 1896, they became the purchasers, the price being 10,000*l.* worth of shares and 15,000*l.* worth of debentures in the company. The company's business, however, did not prove very successful. In 1897 the Plymouth Corporation conceived the idea of developing the property, and it was thought that this would have a beneficial effect on the neighbourhood. At this time the defendants carried on the business of grain carriers, merchants, millers, and maltsters, their headquarters being at Plymouth. In September, 1897, they agreed to purchase the plaintiffs' property for 45,000*l.*, a contract being signed on June 6, 1898, and 1,000*l.* being paid by the defendants as a deposit. The plaintiffs alleged that if the Plymouth Corporation scheme had been carried through this would have been a small price to pay for the property, but the Admiralty declined to allow the scheme to proceed. During the year 1899 defendants made various excuses for not completing the purchase, and during that year they got into financial difficulties, and in 1900 went into liquidation, when the plaintiffs received a letter from the liquidator renouncing the contract. The present action was then commenced, the plaintiffs claiming to be entitled to the difference between the present value of the property, which they assessed at 23,000*l.*, and 45,000*l.*, the price the defendants would have paid for it. At the trial, evidence of value having been given, the jury assessed the damages due to the plaintiffs at 20,000*l.* At the conclusion of the arguments on the point of law raised by the defendants, that the contract entered into by them was *ultra vires* the company, Mr. Justice Grantham gave judgment for the plaintiffs on the point of law raised, with costs. Hence the present appeal of the defendants.

Lord Justice Vaughan Williams read the judgment of the court affirming the decision of Mr. Justice Grantham, and dismissing the appeal with costs.

Mr. Rufus Isaacs, K.C., and Mr. R. E. Moore appeared for the appellants; and Mr. Duke, K.C., and Mr. Clavell Salter for the respondents.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

3,677.—JUNCTION-BOXES (ELECTRICITY): *F. Coenen.*—An opening in the cover-plate is either closed with an insulated plate or cap or is fitted with a terminal cap which is secured to the tube of the branch conductors. Studs are passed through an insulating plate in the cap, and are connected above to the branch leads, their ends being suitably shaped for engagement with springs on the main-lead bridging-pieces.

3,695.—A METHOD OF HEATING GREENHOUSES OR OTHER BUILDINGS: *E. J. Johnstone.*—The hot-water circulation pipes are laid in closed troughs or tanks built of bricks and lined with cement. Hand-holes are made in the covering or top.

3,753.—ELECTRICAL FITTINGS AND CONNEXIONS: *J. D. Andrews.*—For a junction-box or case the branches are clamped by the armouring. For a lamp-holder the insulating-block has grooves and is retained in its place with grooves in the casing, and a union with a grip for the cable consists of a cable of which the armour is turned back over a ferrule, the cable being gripped with a cap screwed on to the tube, at the other end of which is an insulator

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clamped to the conductor upon the lamp-holder. Other adaptations are specified.

3,768.—MATERIALS FOR CEMENTS: *W. Michaelis.*—The inventor claims that the cements are highly resistant to the action of sea-water, which has an adverse effect upon the calcium aluminate of Portland cement. For the alumina, therefore, he substitutes oxide of iron, manganese, or chromium; he also mixes ground brown hæmatite, calcareous ironstone, bog-iron ore, and so on with a silicious calcareous marl or burnt lime, with the addition of silica if needed. The compound is burned at a sintering or clinkering temperature, and then finely pulverised.

3,788.—IMPROVEMENTS IN VICES: *P. Forster.*—A plain tube having a flange on which are lugs is mounted upon the movable jaw, and an internally screwed tube upon the fixed jaw. A screw-threaded rod having lugs for engagement with the lugs on the flange of the former tube is pivoted out of centre in respect of the tube. When the handle of the rod is turned the threads of the rod engage with those in the latter tube. The lugs also engage, and the vice will act as an ordinary screw-vice. In another shape the tubes and the rod are concentrical, whilst on the latter is mounted a lug placed out of centre which has threads for engagement with those in the other tube and passes through a slot in the plain tube.

3,814.—A STRAP-HINGE FOR HEAVY DOORS, GATES, &C.: *F. Dornan.*—A nut fixes the strap to a pin which has a collar against which the nut forces the pin. The upper end of the pin is carried by a ring, and its lower end lies in a bearing. For separating the parts of the hinge one takes the pin out of its bearing and turns it round to clear the lower end; otherwise, the nut is discarded and replaced with a projection from the collar that enters a socket of the strap. A washer on the pin keeps the bearing free from dust.

3,823.—CONDUITS FOR ELECTRICAL CONDUCTORS: *R. Ames.*—The sections are fitted together with spigot-and-socket joints. They are divided lengthwise with webs of a uniform thickness, and the bottom channel will serve as a drain for water.

3,824.—MANUFACTURE OF EARTHENWARE DRAIN-PIPES, &C.: *R. Ames.*—The segments of the die of an extrusion machine are joined with vertical ribs to a screwed boss or ring upon a collar at the end of a hanging bolt in the clay cylinder. To the table, which rises and falls, is affixed the socket-die, having air-holes and a recess over the socket shoulder; a pin of the collar enters a hole in the boss. There are holes in the die-segments for projections from the die. After the socket has been moulded the socket-die falls together with the table, and clay is pressed between the dies and through spaces between the segments for making the pipe-body; a ring may be affixed to an ordinary socket-die, in place of the special die described.

3,853.—BLOCKS, SLABS, AND PLATES FOR USE BY BUILDERS AND OTHERS: *A. Mack.*—Wooden bars, to be seen on one side, are embedded at equal intervals in blocks or slabs of cement, gypsum, &c. The latter are fashioned by laying the bars in the channel of a moulding plate and spacing them with notched adjusting plates. They are held in position with a strip clamped across them; then the adjusting plates are taken away and cement, &c., is filled into the channel. A fire-resisting and sound-proof wall is coated on the outside with wooden shingles nailed on to bars embedded in the slabs, between which and the inner part of the wall is left a space made by hollow bricks coated with plaster. For ceilings is devised a cane mat of open work which is fastened with staples to the bars, and to which the plaster will adhere. To prevent cracks in the plaster at the joints between the slabs the joints are covered with crossed wires nailed on to the bars. For floors the ceiling of the room below is constructed of slabs, whilst a second range of slabs is laid upon laths between the joists. The invention is described as being equally available for solid walls.

3,859.—A CONTRIVANCE FOR USE IN DEEP BORING: *A. Wache.*—For measuring the deviation and depth of a borehole a line is fixed by lowering a gripping device into the shaft, and the line is then stretched from a point high above the surface, its deviation at the surface from the central line being ascertained by a special instrument, which comprises a cylinder carried by a frame that can be rotated with a worm and worm-wheel, or some such means. The surveying line passes through a sliding eye upon the slotted cover-plate of the cylinder, and the eye has a pointer that travels over a scale; the gripping device is lowered with a rope secured to a base, and carrying a casing, together with a sliding cylinder, through which slides the rod to which the surveying-line is secured. The rod is weighted, and is linked to gripping claws pivoted on to the cylinder. When the surveying-line is taut and the lowering rope is slack, the combined action of the links and of bell-crank levers forces the claws asunder through openings in the casing against the sides of the borehole.

3,917.—FITTINGS FOR WATER-CLOSETS: *C. Wills.*—A curved branch joins the basin to the soil-pipe, and below the water level is a joint after the kind specified in No. 19,484 of 1900. A removable block carries the basin, and an interior protection-lip is formed upon the ventilating branch of the soil-pipe.

3,947.—APPLIANCES FOR WORK IN MOSAICS: *W. Mainzer.*—The inventor seeks to prevent cracking and to effect an improvement in the appearance of continuous mosaic work which is spread over a comparatively large area. He embeds metallic dividing strips in the mosaic and secures them in the concrete or similar foundation with flanges, or bolts, or lugs, and so on.

3,991.—MEANS OF EXTINGUISHING OIL LAMPS: *A. C. Fones (Messenger & Sons).*—When a lamp has been accidentally tilted or overturned, a sliding-sleeve extinguisher at once comes into play through the agency of a weight which acts upon the outer and inclined end of a pivoted lever. The frame swings freely upon a bracket upon the burner, and is set so that one can manipulate the extinguishing lever in the ordinary manner.

4,033.—REGULATING APPARATUS FOR ELECTRICAL LIFTS: *A. Stigler.*—When one closes either of the two switches for "up" and "down," an auxiliary motor will cause a centrifugal governor to rotate and to take off the brake, together with a movement of a rod towards the right whereby the main motor switch lever is worked: the rod is moved into either the "up" or the "down" position by means of an engagement between the one or the other of projections with corresponding projections from the lever accordingly with the place assumed by the rod. For example, when the "down" switch is closed, the rod will be raised and the solenoid energised, the lever being moved in the opposed direction.

4,074.—IMPROVEMENTS IN DOORS: *W. H. Hamblett.*—The projecting side pins of a smooth, hingeless door slide in slotted plates of the frame, the slots in the lower plates being L-shaped, and those in the upper plates being inclined or curved for the insertion of the door, which is locked by means of pivoted plates that fall automatically over the side pins. For removal of the door the pivoted plates are forced backwards to clear the pins by the prongs of an unlocking and lifting handle or cross-bar; hooks that fit beneath the pins raise the door out of the slotted plates.

4,121.—A PRICE INDICATOR FOR GAS-METERS: *F. Roberts.*—A device for showing the cost of the gas consumed comprises a casing with three openings and three rollers to be turned by hand. Of the four spaces upon each roller one indicates the numeral shown by the pointer of the corresponding dial, and the three others mark the cost in *l.* s. and d. respectively of the number of cubical feet indicated by the numeral of the roller; bevel or other gearing may join the rollers to the spindles, severally, of the dials, which in that case will themselves turn the rollers. Tens and hundreds of cubical feet are indicated at an opening which shows two noughts.

4,123.—SAFETY APPLIANCES FOR LIFTS: *C. W. Hildred and R. Waygood & Co.*—For automatically stopping the motor and working the safety retaining gear. The drum for the rope secured to the balance-weight is mounted on the cage, and has projections that will work a break-switch either in the main-motor circuit or in the controlling circuit, and are normally retained clear from the switch by a second rope wound around the drum and having a spring-tension; the switch will be opened whenever an increase or a decrease of tension arises from the breaking of the lifting-rope or from the cage or balance-weight being obstructed. The drum may be worked by means of a centrifugal governor which will grip the rope in case of an excess of speed, or the drum may be worked by hand from the inside of the cage.

4,124.—IMPROVEMENTS IN LIFT-VALVES: *F. N. Mackay.*—In order to facilitate repairing, a cap, fitted on to the casing, contains a valve which a spring forces upwards. Abutting projections from one or both of the valves normally prevent the valve from becoming seated upon the underside of the diaphragm. The subsidiary valve will close upon its seating, and so arrest the outflow when one takes the main valve out of its casing. The invention is described as being available for use with air valves and for general purposes.

4,176.—MANUFACTURE OF WHITING: *J. S. Rigby.*—The wash-mill is provided with mixing and stirring rakes and breakers driven by gearing. The mixture passes through an opening covered with a strainer into a similar wash-mill, and thence into a trough placed at the back and along the ends of a row of settling-tanks. Removable dams in the trough serve to turn the liquid into conduits set lengthwise. The liquid then flows over a weir into another conduit, and so through holes in the dividing-wall to near the bottom of the first of the vats, and ultimately to a filter. Inclined doors allow of the deposit being removed from the bottoms of the vats. Porous floors through which the water is drawn by a pump will serve for filtering purposes.

4,257.—A HOLDFAST FOR PIPES: *W. Ogden.*—For fastening rain-water and similar pipes to house-walls are devised spikes having detachable screwed heads, or else slots for cottars, that will pass through distance-pieces or sleeves; the pipes can thus be secured at a distance from the walls, so that injury of the latter through leakage is avoided.

4,316.—PROCESSES FOR HARDENING AND COLOURING PLASTER AND GYPSUM.—*J. L. Kessler.*—A solution of an alkaline silicate, steeped with silica, is employed for imparting a washable surface to plaster, but for hardening purposes the solution should contain much more alkali than is commonly used; impregnation is facilitated by washing the plaster at intervals with either diluted hydrofluoric acid or caustic potash, which will clear silicious deposits out of the pores. For producing porosity the plaster is mixed with chalk, dead plaster, over-burned gypsum, lime, cement, volcanic ash, &c., either singly or in combination. A precipitation of silicious deposits will be effected by wetting a too-absorbent surface with an almost neutral alkaline silicate. Such treatment renders the plaster ready for being painted. The specification describes means of painting fresh or dry plaster in water-colours, and of fixing the colours. Solutions of alkaline silicates may be mixed with white or coloured plasters, used for covering surfaces, immediately before the plaster is applied to the wall or other surface.

4,330.—APPLIANCES FOR INCANDESCENT LAMPS (ELECTRICAL): *H. J. Dowsing.*—A cap, of which the recessed contact-pieces take split pins, is fixed in a holder on a heating or lighting lamp; the pins may be gripped in tapered and rounded grooves as the cap is turned in its holder, or the contact-pieces may be tubular, in which form one pushes the cap into the holder without turning it, where it will be held by the split pins alone, or by springs, or other means. The holder can be supported in a stove with a screw ring.

MEETINGS.

SATURDAY, JUNE 28.

Edinburgh Architectural Association.—Excursion to Carlisle and Lanercost.

St. Paul's Ecclesiological Society.—Visit to St. Olave, Hart-street, and All Hallows, Barking. 2.30 p.m. at St. Olave's.

TUESDAY, JULY 1.

Hellenic Society.—Annual Meeting at the Society of Antiquaries' Rooms. 5 p.m.

WEDNESDAY, JULY 2.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting. 8 p.m.

Royal Archæological Institute.—General meeting, 20, Hanover-square, 4 p.m. Papers on "Exchequer Tallies" (Mr. Philip Norman) and "Roman Arches at Susa and Aosta" (Professor B. Lewis).

THURSDAY, JULY 3.

Society for the Encouragement of the Fine Arts.—Mrs. Philip H. Newman on "Some of the Chateaux on the Loire." 8 p.m.

SATURDAY, JULY 5.

Northern Architectural Association.—Annual Excursion.

Edinburgh Architectural Association.—Annual Excursion: Carlisle, Lanercost Priory, and Naworth Castle.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

June 10.—By P. M. PUCKRIDGE (at Pewsey).

Pewsey, Wilts.—Ball, freehold house and 1 a. 1 r. 34 p.	£325
High-st., Bridge House (S.), f.	480
Verandah-row, four freehold cottages	170

June 11.—GUDGEON & SONS (at Winchester).

Itchen Abbas, Hants.—Itchen Cottage and 7 a. 2 r. 6 p., f., p.	3,300

By HANNAFORD & SON (at Eggesford).

West Worlingham, Devon.—House Farm, 112½ a., f., y.r. 70*l.*	1,150

By BENTLEY, HOBBS, & MYTTON (at Worcester).

Winslow, Hereford.—The Rowden Estate, 250 a. 0 r. 19 p., f.	5,300
South Caines, Worcester.—Lansdowne House and 1 a. 0 r. 5 p., f., p.	1,750
Littleworth Orchard, 3 a. 3 r. 17 p., f.	710
Lansdowne-rd., piece of pasture, 1 a. 2 r. 24 p., f.	500

June 12.—By EDWARDS, SON, & BIGWOOD (at Birmingham).

Wolverton, Warwick.—Wolverton Court Farm, 208 a. 2 r. 0 p., f. (including timber)	4,366

By FAREBROTHER, ELLIS, & Co. (at Newbury).

East Woodhay, Hants.—Cottage and plot of land, 0 a. 2 r. 2 p., f.	210
Enclosure of land, 8 a. 2 r. 9 p., f.	630
Six building plots, 7 a. 0 r. 13 p., f.	1,145
Enclosure of land, 3 a. 0 r. 23 p., f.	195
Hollington Cross Farm, 21 a. 0 r. 20 p., f.	1,180
Bucklebury, Berks.—Hawkridge Wood and Whitmore Copse, 67 a. 2 r., f.	1,500
Little Quaries Wood, 4 a. 2 r. 18 p., f.	300
New Common Enclosure, 11 a. 2 r. 38 p., f.	300
House Leas Wood, 7 a. 0 r. 31 p., f.	280

By NEWBON, EDWARDS, & SHEPHARD.

Chelsea.—27, 28, and 29, Gertrude-st., u.t. 58 yrs., g.r. 3*s.*, y.r. 124*l.*	1,465
20, Limerston-st., u.t. 48 yrs., g.r. 5*l.*, y.r. 40*l.*	390
Islington.—9, Rotherfield-st., u.t. 38 yrs., g.r. 5*l.*, y.r. 33*l.*	270
Clerkenwell.—35, Bowling Green-lane, y.r. 48*l.*; also l.g.r. 6*l.*, u.t. 27 yrs., g.r. 10*l.*	350
Barnsbury.—14, Upper Park-st., f., e.r. 34*l.*	385
64, Brooksby-st., f., e.r. 32*l.*	320
Highbury.—140, Calabria-rd., u.t. 83 yrs., g.r. 9*l.* 7*s.* 6*d.*, y.r. 55*l.*	525
Victoria Park.—53 and 55, Victoria Park-rd., u.t. 47¾ yrs., g.r. 8*l.*, y.r. 63*l.* 12*s.*	545
Tottenham.—16, 30, 57, and 59, Cranleigh-rd., u.t. 85½ yrs., g.r. 20*l.*, y.r. 130*l.* 14*s.*	925

By WM. STEVENS.

Dalston.—8 and 10, Albert-rd., u.t. 37½ yrs., g.r. 10*l.*, e.r. 84*l.*	810

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Walthamstow.—178 to 188 (even), Blackhorse-rd., u.t. 81½ yrs., g.r. 27*l.* 10s., w.r. 161*l.* £700
By STIMSON & SONS.
Norwood.—37, Howard-rd., f., y.r. 75*l.* 1,100
Forest Gate.—11 Claremont-rd. u.t. 74½ yrs., g.r. 8*l.* 8s., e.r. 45*l.* 425
15, St. James s-rd., f., w.r. 23*l.* 18s. 280
Peckham.—3, 3a, 5 and 5a, Queen's-rd. (S), u.t. 23½ yrs., g.r. 100*l.*, y.r. 270*l.* 1,060
South Lambeth.—73, Hartington-rd., f., y.r. 42*l.* 560
Charlton, Kent.—1 to 11 (odd), and 4, 8, and 10, Morley-rd., u.t. 70 yrs., g.r. 36*l.*, w.r. 257*l.* 8s. 1,350
Manor Park.—145 to 150 (odd), Bessborough-rd., u.t. 97¾ yrs., g.r. 30*l.*, w.r. 156*l.* 700
Dalston.—119 and 121, Culford-rd., u.t. 20¾ yrs., g.r. 4*l.* 18s., y.r. 64*l.* 450
Stockwell.—43, 45, and 47, Edithna-st., u.t. 70½ yrs., g.r. 15*l.*, w.r. 111*l.* 16s. 895
Clapham.—54 and 55, Cottage Grove, u.t. 43 yrs., g.r. 7*l.*, w.r. 62*l.* 8s. 450
By JOSEPH STOWER.
Canterbury, Kent. Barton Court, and 21a. 2r. 20p., f. (including the Manor of Barton) 7,500
Part of Little Barton Farm, 91a. 1r. 8p., f. .. 4,000
Fordwich, Kent. - Freehold marsh land, 9a. 2r. 39p. 320
By W. N. WILLOUGHBY.
Dulwich.—117, Rosendale-rd., u.t. 81 yrs., g.r. 8*l.* 10s., p. 740
June 13.—By BEALE & CAPPS.
Paddington.—344, 346, and 348, Harrow-rd. (S), u.t. 60½ yrs., g.r. 30*l.*, y.r. 325*l.* 4,705
Notting Hill.—16, Tobin-st., with yard, stabling, &c., f., y.r. 50*l.* 700
4 and 5, Bramley-st., u.t. 81½ yrs., g.r. 11*l.*, w.r. 70*l.* 4s. 440
59, Tobin-st., u.t. 21, 26, and 27 yrs., g.r. 4*l.* 14s., y.r. 40*l.* 700
Acton.—Stanley-rd., f.g. rents 24*l.*, reversion in 75 yrs. 555
Kilburn.—133, Cambridge-rd. (S), u.t. 74 yrs., g.r. 10*l.*, y.r. 55*l.* 600
By BUCKLAND & SONS.
Datchet, Bucks. — Goodwyn House, Thames Cottage, and Eldertree Cottage, f., p. 3,650
By WM. CLARKSON.
Poplar.—3, 4, and 5, Chapel House-st., u.t. 40 yrs., g.r. 6*l.*, w.r. 101*l.* 8s. 600
Millwall.—214, 216, and 218, West Ferry-rd., u.t. 14 yrs., g.r. 6*l.*, w.r. 70*l.* 4s. 150
Anerley.—4, Wheathill-rd., f., y.r. 34*l.* 430
By FULLER, MOON, & FULLER.
Epsom, Surrey.—South-st., freehold warehouse, shop, and two houses, with stabling and land, y.r. 100*l.* 2,700
Ewell, Surrey.—High-st., freehold shop and house, y.r. 30*l.* 760
High-st., The London House Stores, f., y.r. 60*l.* 1,250
1 to 4, West-st. (S), with stable, f., y.r. 110*l.* .. 1,210
West-st., three freehold cottages, w.r. 29*l.* 18s.. 350
West-st., a plot of building land, f. 210
1 and 2, Hop-pole Cottages, also Lyncroft Cottages (two) adjoining, f., w.r. 66*l.* 6s. 1,125
Chessington-rd., Chessington House and 1¾ a., f., y.r. 102*l.* 2,000
Wroxall, Isle of Wight.—Wroxall Farm, 453 a. 0 r. 18 p., f.; also a perpetual sum or rent charge of 22*l.* 10s. 6,500
By HARMAN BROS.
Whitechapel.—137, High-st., f., y.r. 172*l.* 3,400
Tottenham.—St. George's-rd., f.g.r.'s 35*l.*, reversion in 74 yrs. 810
By W. W. READ & CO.
Edmonton.—6, 8, 10, and 12, Causey Ware-rd., f., y.r. 128*l.* 740
Holloway.—157, Isledon-rd., u.t. 57¼ yrs., g.r. 7*l.* 15s.. e.r. 48*l.* 430
By SMITH, SON, & OAKLEY.
Old Kent-rd.—Maismore-ter., f.g.r.'s 40*l.*, reversion in 34½ yrs. 1,145
By F. & W. STOCKER.
Brixton Hill.—5, Raleigh-gdns., f., e.r. 120*l.* 2,000
By WOODS & SNELLING.
Southwark.—16 to 20, Queen's-court, f., w.r. 119*l.* 12s. 1,100
Dulwich.—7 and 8, Ardsley-ter., u.t. 73 yrs., g.r. 10*l.*, w.r. 84*l.* 10s. 650
By G. B. HILLIARD & SON (at Chelmsford).
Chelmsford.—69 and 70, Duke-st., f., y.r. 130*l.* .. 2,475
42, Duke-st., f., y.r. 45*l.* 750
Market-rd., two freehold building plots 170
38 to 41, Moulsham-st. and two cottages in rear, f., y.r. 93*l.* 2s. 1,138
Moulsham-st., a freehold building plot 160
Writtle, Essex.—The Green, two freehold cottages, w.r. 12*l.* 3s. 115
By HAMPTON & SONS and W. DEW & SON (at Bangor).
Llansadwrn, &c., Anglesey.—Plas Llansadwrn Farm, 182a. 3r. 0p., f. 6,100
June 16.—By BUCKLAND & SONS.
Camberwell.—13, Grove-Pk, f., y.r. 72*l.* 1,000
Shepherd's Bush.—Goodwin-ter., f.g.r.'s 28*l.*, reversion in 70 yrs. 670
51 to 61 (odd), Boscombe-rd. (S), f., y.r. 190*l.* .. 2,835
Boscombe-rd., f.g.r.'s. 32*l.* 10s., reversion in 70 yrs. 810
Goodwin-rd., three freehold building plots 780
Goodrich-villas, f.g.r. 19*l.* 10s., reversion in 70 yrs. 520
Goodwin-rd., f.g.r.'s 40*l.*, reversion in 70 yrs. .. 1,180
Laffern-rd., f.g.r.'s 139*l.*, reversion in 51 yrs. .. 3,840
Laffern-rd., f.g.r.'s 45*l.*, reversion in 70 yrs. .. 1,200
Cathnor-rd., f.g.r.'s 82*l.*, reversion in 51 yrs. .. 2,180
Cathnor-rd., f.g.r.'s 120*l.*, reversion in 70 yrs. .. 3,070
Coningham-rd., f.g.r.'s 24*l.*, reversion in 51 yrs. 625
Coningham-rd., f.g.r.'s 106*l.*, reversion in 70 yrs. 2,640
By GARRETT, WHITE, & POLAND.
Chalk Farm.—Ferdinand-st., The North Western p.-h., i.g.r. 10*l.*, u.t. 25 yrs., g.r. 14*l.* 1,500
Camden Town.—Murray-st., i.g.r.'s 138*l.*, u.t. 42 yrs., g.r. nil. 2,380
Stratford-pl., i.g.r.'s 128*l.*, u.t. 42 yrs., g.r. nil.. 2,155
Maida Vale.—3 to 11 (odd), Elgin-mews, y.r. 154*l.*, also i.g.r.'s 17*l.*, u.t. 57½ yrs., g.r. 2*l.* .. 1,705
By TYSER, GREENWOOD, & CRIER.
Acton.—48 and 50, Antrobus-rd. (shop and laundry), u.t. 74 yrs., g.r. 9*l.* 9s., w.r. 70*l.* 4s.... 445
Barnes.—79 and 81, Railway-st., f., w.r. 20*l.* 16s.. 450

By G. HEAD & CO.
Ealing.—50, Castlebar-rd., u.t., 59½ yrs., g.r. 16*l.*, y.r. 60*l.* £625
By G. B. HILLIARD & SON.
Broomfield, Essex.—Lower and Top Marsh Enclosures, 21a. 2r. 5p., f. 930
Great and Little Watermans Enclosures, 40a. 1r. 36p., f. 450
By KNIGHT & BRANGWIN.
Clerkenwell.—Mount Pleasant, the Two Blue Posts p.-h., a freehold rental of 100*l.*, with reversion in 37½ yrs. 3,010
By WHITE & SONS.
Newdigate, Surrey.—Sturtwood Estate, 109a. 3r. 24p., f. 1,750
By EDWARD WOOD.
Holloway.—64, Poole's Pk., u.t. 63 yrs., g.r. 4*l.*, y.r. 36*l.* 290
Edmonton.—43, Lawrence-rd. (S), u.t. 84 yrs., g.r. 3*l.* 3s., w.r. 28*l.* 12s. 110
Ilford, Essex.—231, Thorold-rd. u.t. 97 yrs., g.r. 5*l.* 10s., e.r. 28*l.* 245
Silvertown.—26 and 28, Parker-st., u.t. 78 yrs., g.r. 8*l.*, w.r. 59*l.* 16s. 330
Wandsworth-rd.—No. 647a, u.t. 68 yrs., g.r. 3*l.* 7s., e.r. 50*l.* 405
Fulham.—8, Eustace-rd., u.t. 70½ yrs., g.r. 6*l.*, w.r. 41*l.* 12s. 350
67, Britannia-rd., u.t. 54 yrs., g.r. 6*l.*, w.r. 58*l.* 10s. 440
Dartford, Kent.—34 to 40 (even), Howard-rd., u.t. 95 yrs., g.r. 10*l.* 10s., w.r. 79*l.* 6s. 430
102 and 104, Fulwich-st., u.t. 95 yrs., g.r. 5*l.*, w.r. 39*l.* 210
June 17.—By DEBENHAM, TEWSON, & CO.
Islington.—124, 126, and 128, Balls Pond-rd. (S), f., y.r. 155*l.* 3,150
Notting Hill.—Ladbroke-rd, f.g.r.'s 34*l.*, reversion in 33½ years 1,330
Hackney.—Ash Grove, f.g.r.'s 162*l.*, reversion in 64½ yrs. 4,360
Islington.—Noel-st., f.g.r's. 18*l.* 18s., reversion in 31 yrs. 675
Gerrard-st, f.g.r.'s 18*l.* 18s., reversion in 31 yrs. 675
Tooting.—Wandle-rd., f.g.r.'s 12*l.*, reversion in 63¾ yrs. 320
By EASTMAN BROS.
Bermondsey.—47, 49, 51, and 53, Ambrose-st., u.t. 34½ yrs., g.r. 12*l.* 3s., w.r. 114*l.* 8s. 800
By ELLIOTT, SON, & BOYTON.
Regent's Park.—18, Cornwall-ter. and 18, Cornwall-ter.-mews, u.t. 18 yrs., g.r. 10*l.*, p. 3,250
By OAKLEY, FISHER, & CO.
Edgware-rd.—No. 125 (S), also 12, Burwood-pl. (S), u.t. 17¾ yrs., g.r. 19*l.*, y.r. 290*l.* 2,380
By W. HALLETT & CO.
Portman-sq.—30, Upper Gloucester-pl., u.t. 18¾ yrs., g.r. 12*l.* 12s., e.r. 120*l.* 555
By Messrs. KEMSLEY,
Paddington.—47, Hall-pl., u.t. 36 yrs., g.r. 7*l.* 7s., y.r. 36*l.* 245
Tottenham.—151, High-rd., u.t. 65 yrs., g.r. 8*l.* 8s., y.r. 28*l.* 250
Enfield Lock.—1 and 2, Bradley-rd, u.t. 76 yrs., g.r. 4*l.*, w.r. 23*l.* 8s. 140
By NEVILLE & CROSSE.
Putney.—20 to 30 (even), Brandelhow-rd. (flats), u.t. 96 yrs., g.r. 25*l.*, w.r. 132*l.* 12s. 735
By TOOTELL & SONS.
Mottingham, Kent.—High-rd., f.g.r.'s 53*l.* 8s., reversion in 67 yrs. 1,335
June 18.—By BEARD & SON.
Paddington.—8, Spring-st. (S), u.t. 35 yrs., g.r. 12*l.*, y.r. 100*l.* 1,430
Bayswater, 73 and 75, Ledbury-rd. (S), u.t. 41 yrs., g.r. 12*l.*, y.r. 120*l.* 1,420
113, Cornwall-rd. (S), u.t. 62½ yrs., g.r. nil, y.r. 60*l.* 695
117 and 119, Cornwall-rd. (S), u.t. 62½ yrs., g.r. 20*l.*, y.r. 120*l.* 1,005
Westbourne Park.—7, Tavistock-cres., u.t. 54 yrs., g.r. 10*l.*, y.r. 50*l.* 415
Fulham.—6, Melmoth-pl. (S), with yard in rear, f., y.r. 65*l.* 1,375
By G. P. BEST & CO.
Hammersmith.—51, Shaftesbury-rd., u.t. 51 yrs., g.r. 8*l.*, y.r. 40*l.* 375
By F. PERKS.
Thundersley, Essex.—Pitsea-rd., enclosure of pasture land, 1a. 0r. 37p., f. 190
Pitsea-rd., a freehold cottage residence, p. 395
Rayleigh-rd., two freehold cottages, p. 435
Rayleigh-rd., enclosure of meadow, 5a. 0r. 17p., f. 400
High Halstow, Kent.—Buckhole, Burnt House, and Hill farms, 193a. 0r. 16p., f., y.r. 110*l.* 1,100
By MORETON RICHES.
Fulham.—65, Epirus-rd., u.t. 85 yrs., g.r. 5*l.*, w.r. 39*l.* 355
Tooting. — Devonshire-rd., Ormonde, f., w.r. 29*l.* 18s. 303
Fulham.—11, Ismailia-rd., f., y.r. 60*l.* 870
9, 11, and 13, Dimsdale-rd., f., w.r., 88*l.* 8s. 875
Chelsea.—14 and 16, College-st., u.t. 6½ yrs., g.r. 8*l.*, w.r. 95*l.* 18s. 138
8, 13, and 14, Blenheim-st., u.t. 6 yrs., g.r. 12*l.*, w.r. 97*l.* 10s. 183
Marlborough-st., The United Methodist Free Church, Charbon Cottage, and Ash Cottage; also 53, Leader-st., u.t. 6½ yrs., g.r. 15*l.* 1s. .. 285
Fulham.—22, Limerston-st., u.t. 27½ yrs., g.r. 5*l.*, q.r. 42*l.* 365
16, 17, 18, and 19, Parthenia-st., u.t. 77½ yrs., g.r. 24*l.*, y.r. 158*l.* 12s. 1,348
By R. TIDEY & SON.
Notting Hill.—Cornwall-rd., f.g.r.'s 65*l.*, reversion in 60 yrs. 1,770
Cornwall-rd., f.g.r.'s 132*l.*, reversion in 63 yrs. 3,445
Cornwall-rd., f.g.r.'s 10*l.*, reversion in 62 yrs. .. 265
St. Luke's-rd., f.g.r.'s 20*l.*, reversion in 60 yrs. 510
All Saints'-rd., f.g.r.'s 40*l.*, reversion in 62 yrs. 1,030
Basing-rd., f.g.r.'s 32*l.*, reversion in 61 yrs. 825
St. Luke's-mews, f.g.r.'s 85*l.*, reversion in 60 and 61 yrs. 2,070
Roseland-pl., f.g.r.'s 50*l.*, reversion in 61 yrs. .. 1,110
By W. WESTON.
Paddington.—269 and 273, Harrow-rd. (S), u.t. 45½ yrs., g.r. 18*l.*, y.r. 220*l.* 2,840
398, Harrow-rd. (S), u.t. 61 yrs., g.r. 9*l.*, y.r. 85*l.* 1,110

By C. H. & J. W. WILLMOTT.
Shepherd's Bush.—5, Blomfield-rd., u.t. 63 yrs., g.r. 8*l.*, w.r. 59*l.* 16s. £415
Acton.—36, 38, 40, and 42, Fletcher-rd., u.t. 96 yrs., g.r. 21, w.r. 156*l.* 1,050
By DOUGLAS YOUNG & CO.
Herne Hill.—Rymer-st., f.g.r.'s 53*l.* 5s., reversion in 44½ yrs. 1,305
Hurst-st., f.g.r.'s 99*l.* 15s., reversion in 44½ yrs. 2,470
Clapham.—Hambalt-rd., f.g.r.'s 224*l.* 10s., reversion in 88½ yrs. 5,745
Deauville-rd., f.g.r. 8*l.* 10s., reversion in 88½ yrs. 225
Balham.—High-rd., &c., f.g.r.'s 85*l.*, reversion in 85½ yrs. 2,550
3 and 5, Ramsden-rd. (S), f., y.r. 160*l.* 3,100
12, Ramsden-rd. (warehouse), f., y.r. 40*l.* 610
Tottenham.—Ipplepen-rd., f.g.r.'s 77*l.* 8s., reversion in 66½ yrs. 1,730
Seven Sisters-rd., f.g.r.'s 33*l.* 12s., reversion in 77½ yrs. 755
Kingsland.—Phillip-st., &c., f.g.r.'s 56*l.*, reversion in 24 yrs. 1,270
Hackney.—Churchill-rd., &c., f.g.r.'s 32*l.*, reversion in 61¾ yrs. 720
Clapton.—Glyn-rd., f.g.r.'s 50*l.*, reversion in 75 yrs. 1,150
Lockhurst-st., f.g.r.'s 13*l.*, reversion in 74 yrs. 215
Canning Town.—Vincent-st., f.g.r.'s 36*l.* 10s., reversion in 62¾ yrs. 765
Wouldham-st., f.g.r.'s 13*l.* 10s., reversion in 37 yrs. 292
Bermondsey.—Banyard-rd., f.g.r.'s 56*l.*, reversion in 44 yrs. 1,185
Keeton's-rd., &c., f.g.r.'s 15*l.*, reversion in 44 yrs. 375
Grange-rd., f.g r.'s 44*l.*, reversion in 84 yrs..... 1,050
Larnaca-st., f.g.r.'s 12*l.*, reversion in 144 yrs. .. 670
Old Kent-rd.—Pomeroy-st., f.g.r.'s 20*l.*, reversion in 22½ yrs. 515
51, 53, and 55, Maltby-st., f., w.r. 93*l.* 12s. 860
Poplar.—Northumberland-st., &c., i.g.r.'s 80*l.* 16s., u.t. 51 yrs., g.r. 24*l.* 830
Upper North-st., &c., i.g.r.'s 185*l.* 3s., u.t. 51 yrs., g.r. 48*l.* 1,930
Wandsworth.—48 to 58 (even), Point Pleasant, w.r. 72*l.* 3s., i.g.r.'s 77*l.* 10s., u.t. 6 yrs, g.r. 42*l.* 9s. 250
Bermondsey.—Jamaica-rd., &c., i.g.r.'s 63*l.* 12s., u.t. 44 yrs., g.r. 16*l.* 10s. 775
Stratford.—Carpenter's-rd., i.g.r.'s 47*l.* 10s., u.t. 60 yrs., g.r. 10*l.* 10s. 590
Tottenham.—Cornwall-rd., i.g.r.'s 69*l.* 1s., u.t. 52½ yrs., g.r. 1*l.* 18s. 1,005
Old Ford.—Wennington-rd., &c., i g.r.'s 112s 16s, u.t. 55 yrs., g.r. 31*l.* 10s. 1,165
Messrs. KEMSLEY (at Romford).
Romford, Essex.—White Hart-lane, four freehold cottages, w.r. 41*l.* 12s. 585
17 and 18, Market-pl. (S), f., y.r. 48*l.* 760
36 and 38, North-st. f., y.r. 37*l.* 480
Havering, Essex.—The Green, freehold butcher's shop, with slaughterhouse, &c., y.r. 30*l.* 470
The Green, freehold house with forge, &c., y.r. 21*l.* 11s. 400
The Green, three freehold cottages, w.r. 19*l.* 10s. 250
June 19.—By H. J. BROMLEY.
Sydenham.—84, Kirkdale, u.t. 48 yrs., g.r. 10*l.*, y.r. 40*l.* 285
3, Oaksford av., u.t. 53 yrs., g.r. 3*l.* 12s., w.r. 23*l.* 8s. 190
Norwood.—85, Thornlaw-rd, f., y.r. 24*l.* 415
Knight's Hill-rd., freehold workshop, y.r. 10*l.* 180
By COOPER & GOULDING.
Shepherd's Bush.—5 and 7, Leffern-rd., u.t. 70 yrs., g.r. 10*l.*, w.r. 54*l.* 12s. 331
Kentish Town.—49, Prince of Wales-cres., u.t. 20 yrs., g.r. 5*l.* 5s., y.r. 34*l.* 150
By CURTIS & SHARP.
Canning Town.—18, 20, 22, 33, 35, 37, 63, 65, 67, and 69, Peter-st., u.t. 61½ yrs., g.r. 40*l.* 10s., w.r. 278*l.* 4s. 1,330
18 to 22, 24 to 28, Cooper-st., u.t. 61½ yrs., g.r. 35*l.*, w.r. 217*l.* 2s. 1,045
72 to 88 (even), Mary-st., u.t. 61½ yrs., g.r. 30*l.* 10s., w.r. 186*l.* 965
28 to 44 (even), Lansdowne-rd., u.t. 75 yrs., g.r. 27*l.*, w.r. 231*l.* 8s. 1,450
By WALTER HALL.
Battersea.—33, Winstanley-rd., u.t. 62½ yrs., g.r. 7*l.*, y.r. 45*l.* 430
Brixton.—11, Sudbourne-rd., u.t. 65 yrs., g.r. 7*l.* 13s., y.r. 40*l.* 325
Claribel-rd., i.g.r. 23*l.* 5s., u.t. 12 yrs., g.r. 15s. 110
By HAMPTON & SONS.
Friern Barnet.—Oakleigh Park, Drumna House, f. and 1¾ acres, y.r. 175*l.* 2,480
By HOLLIDAY & STANGER.
Bromley, Kent.—34, 36, and 38, Liddon-rd., f., w.r. 74*l.* 2s. 625
By W. T. MARSH.
Kensington.—46 to 56 (even), Scarsdale Villas, f., y.r. 410*l.* 7,275
By MATTHEW MILES.
Brompton.—188 and 188A, Brompton-rd. (S), f., with off-licence and goodwill, p. 5,950
190, Brompton-rd. and 61, Brompton-sq., building site, area 1,750 ft., f. 4,000
By C. C. & T. MOORE.
Mile End.—33, 35, and 37, Huddart-st., u.t. 72 yrs., g.r. 15*l.*, w r. 117*l.* 1,000
Spitalfields.—37, Fournier-st. (S), f., w.r. 78*l.* .. 1,150
Leytonstone.—75, Bulwer-rd., f., y.r. 30*l.* 380
Poplar.—53 and 55, Kerbey-st. (S) and 25, Southill-st., u.t. 52 yrs., g.r. 8*l.* 10s., w.r. 85*l.* 16s. 375
By NEWBON, EDWARDS, & SHEPHARD.
Kentish Town.—81 to 87 (odd), Leighton-rd., u.t. 38½ yrs., g.r. 20*l.* 5s., q.r. 150*l.* 14s. 1,370
Islington.—27, Florence-st., f., y.r. 45*l.* 820
10, Compton-ter., u.t. 15 yrs., g.r. 5*l.* 5s., y.r. 65*l.* 480
Chiswick.—19, Rusthall-av., u.t. 96½ yrs., g.r. 10*l.*, e.r. 60*l.* 450
Brixton.—10, Shannon-gr., with ground in rear, u.t. 65 yrs., g.r. 12s., y.r. 45*l.* 750
Holloway.—55 and 57, Highgate Hill, u.t. 43 yrs., g.r. 15*l.*, y.r. 70*l.* 670
Wimbledon.—2, 4, 6, 8, 10, and 10A, South-rd., f., w.r. 136*l.* 10s. 1,100

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COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums	Designs to be delivered
*Artisans' Dwellings	Metropolitan Boro' of Bermondsey	100*l.*, 60*l.* and 40*l.*	Sep. 16

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Erection of Laundry at Workhouse	Rochford Union	Greenhalgh & Brockbank, Architects, Southend-on-Sea	June 30
*New Club House, Lowestoft	Royal Norfolk & Suffolk Yct. Club	G. J. & F. W. Skipper, 7, London-street, Norwich	do.
*New Vagrants' Block at Workhouse	Ware Union	C. Smith & Son, Architects 164, Friar-street, Reading	July 1
Road Works, Egerton-road, &c.	Withington U.D.C.	A. H. Mountain, Civil Engineer, Town Hall, West Dilsbury	do.
Additions to School, Winchester		Thos Stopher, Architect, 57, High-street, Winchester	do.
Alterations to Clarence Hotel, Pontypool		T. Roderick, Architect, Merthyr	do.
Stabling	Brownhills (Staffs) U.D.C.	W. B. Chancellor, Surveyor, Brownhills	July 2
Road Works, Marine Parade	Clacton U.D.C.	A. R. Robinson, Surveyor, Town Hall, Clacton	do
Chapel, Cymmer, Port Talbot		Rev. D Jones, Cymmer, Port Talbot	July 3
Bridge Works, Yardley	Worcester County Council	J. H. Garrett, Surveyor, Shire Hall, Worcester	do.
Road Metal, Snaresbrook	Wanstead U.D.C	W. Blewitt, Council Offices, Wanstead	do.
*Timber Station Buildings at Gwys	Midland Railway	Company's Architect, Cavendish House, Derby	July 4
Steel Bridge, Victoria Docks	Aberdeen Harbour Commissioners.	R. G. Nicol, Engineer, Aberdeen	do.
Electrical Equipment, Bewick-road	Willington Quay Industrial Board	Secretary, Board's Offices, Willington Quay	do.
Granite (400 tons)	Branksome (Dorset) U.D.C.	S. J. Newman, Surveyor, Council Offices, Branksome	do.
*Glazed Stoneware Drain Pipes	Brighton Council	Council's Surveyor, Town Hall, Brighton	do.
*Painting Base & Company's Premises in St. Pancras-rd.	Midland Railway Co.	Company's Architect, Cavendish House, Derby	do.
School, Clarence-street	Swindon (Wilts) School Board	Bishop & Pritchett, Architects, Swindon	July 5
*New Buildings (Steel Roof, Slating, Plumbing, &c.)	Glasgow & W. Scotland Tech Coll.	The Secretary, 38, Bath-street, Glasgow	do.
Electric Lighting Plant	Ipswich Corporation	Kennedy & Jenkins, Civil Engineers, 17, Victoria-street, S.W.	do.
Bridge Works, Deddo	Northumberland County Council	J. A. Bean, Surveyor, Moot Hall, Newcastle	do.
*Re-covering (Zinc and Glass) of Market Hall Roof	Coventry Corporation	City Engineer, St. Mary's Hall, Coventry	July 7
Sixty Cottages, Gellifaelog, Penydarren	Building Club	T. Roderick, Architect, Merthyr	do.
Electrical Plant (Contracts 4 and 5)	Stalybridge, &c., Electricity Brd	T. Schofield, Town Hall, Stalybridge	do.
Lime (5,000 tons)	Sheffield Gas Co.	H. Thomas, Commercial-street, Sheffield	do.
Sewerage Works (10 miles)	South Stoneham (Hants) R.D.C.	Bailey-Denton & Co., C.E., Palace Chambers, Westminster	do.
Sewers, &c. (4½ miles)	Nuneaton U.D.C.	J. S. Pickering, Civil Engineer, Council Offices, Nuneaton	do.
*Painting Roofs, &c., at Baths and Washhouses	Kensington Royal Boro' Council	Borough Engineer, Town Hall, Kensington High street	do.
Water Mains	Castleford U.D.C.	W. Green, Surveyor, Council Offices, Castleford	July 10
Water Supply	Branston (Lincs) R.D.C.	J. Clare, Civil Engineer, Sleaford	do.
Sewerage Works, Helsby	Runcorn R.D.C.	W. H. Radford, Civil Engineer, Albion Chambers, Nottingham	July 12
*Storage Reservoir, &c.	Oxford Corporation	City Engineer, Town Hall, Oxford	July 14
*Technical School, Tower-road	Hastings (U.D.) School Board	A. W. Jeffery, 5, Havelock-road, Hastings	July 15
*Completion of St. Matthew's Church, Cockington	The Committee	J. E. Drower, 10, Great George-street West, S.W.	do.
*Laying Stoneware Ducts for Tramways	London County Council	County Hall, Spring Gardens, S.W.	do.
*Additions, &c., to Tramways Depot, Balham, S.W.	do.	Architect's Department, 19, Charing Cross-road, W.C.	do.
*Laundry Plant	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	July 16
Water Supply	Cheltenham Corporation	J. Hall, Civil Engineer, Municipal Offices, Cheltenham	do.
*New Infirmary at North Evington	Parish of Leicester	Giles, Gough & Trollope, 28, Craven-street, Charing Cross	July 21
*Laying Artificial Stone Paving	Wanstead U.D.C.	Council's Surveyor, Wanstead, N.E.	July 31
Shop, West View, Chopwell, Co. Durham	Messrs. Nelson & Potts	J. G. Burrell, Architect, Market-place, Durham	No date
Two Cottages	do.	do.	do.
Club Premises, Crawshaw Booth, Lancs		J. H. Spencer, Architect, Rawtenstall	do.
Church and Schools, near Snaith		Garside & Pennington, Architects, Pontefract	do.
House, Rochdale-road, Heywood, Lancs	Heywood (Lancs) Cricket Club	Openshaw & Gill, Architects, Bury	do.
Pavilion, Pot Hall Grounds	Moulton (Northants) Ind. Soc., Ld.	do.	do.
Additions to Premises	Newcastle-on-Tyne Roy. Vic. Inf.	Brown & Mayor, Architects, 63, Abingdon-street, Northampton	do.
*Supply of Lancashire Steam Boilers, &c.	Mr. J. H. Dawson	Secretary, Prudential Buildings, Newcastle-on-Tyne	do
House, Green-lane, Barnard Castle	Ely Brewery Co., Ltd.	Pegg & Co., Architects, 7, Market-place, Barnard Castle	do
Additions to Clive Arms Hotel, Cardiff	Messrs. Robinson Bros.	Jones & Co., Architects, 95, St. Mary-street, Cardiff	do.
Business Premises, English-street, Carlisle		Oliver & Dodgshun, Architects, Carlisle	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Required.	Salary.	Application to be in
*Teacher of Carpentry and Joinery	Middlesex C.C. (Finchley Local Cm.)	Not stated	July 16
*Clerk of Works	Dudley Union	250*l.* per annum	No date

Those marked with an asterisk (*) are advertised in this Number. *Competition*, p. iv. *Contracts*, pp. iv. vi. viii. & x. *Public Appointments*, xviii.

Barnsbury.—20, Offord-rd. (S), u.t. 39 yrs, g.r. 7*l.*, y.r. 50*l.* £360
Stoke Newington.—48, Springdale-rd., u.t. 64½ yrs., g.r. 5*l.* 17s., y.r. 44*l.* 435
Tottenham.—41, Langham-rd., u.t. 75 yrs., g.r. 6*l.*, y.r. 40*l.* 390
Hornsey.—70, Alexandra-rd., u.t. 77½ yrs., g.r. 7*l.*, y.r. 26*l.* 275

By STIMSON & SONS.

Old Kent-rd.—Nos. 337, 339, 341 and 347 (S), u.t. 58 yrs., g.r. 60*l.*, y.r. 280*l.* 3,600
39 to 45 (odd), Symrks-rd., u.t. 18½ and 17½ yrs., g.r. 14*l.*, w.r. 135*l.* 4s. 500
91 to 105 (odd), Smyrks-rd., u.t. 19 yrs., g.r. 28*l.*, w.r. 278*l.* 4s. 1,020
Notting Hill.—252, 254, and 256, Cornwall-rd., u.t. 50 yrs., g.r. 18*l.*, y.r. 114*l.* 1,010
Battersea.—187 and 189, York-rd. (S), u.t. 24 yrs., g.r. 7*l.* 4s., y r. 72*l.* 605
Holloway.—12 to 18 (even), Ellenborough-rd., u.t. 60½ yrs., g.r. 13*l.*, w.r. 100*l.* 915
36 and 60, Hampden-rd., u.t. 62 yrs., g.r. 8*l.* 10s., w.r. 75*l.* 8s. 450
Norwood.—156, Church-rd., u.t. 59 yrs., g.r. 24*l.*, y.r. 110*l.* 530
165, 170, and 172, Church-rd., u.t. 61 yrs., g.r. 66*l.*, y.r. 305*l.* 2,000
1, 3, 5, and 7, Upper Beulah Hill, u.t. 61 yrs., g.r. 14*l.*, y.r. 412*l.* 2,810
Anerley-rd., &c., i.g.r. 29*l.*, u.t. 58 yrs., g.r. 14*l.* 280

By CASTLE, SON, & BOOTH.

Great Bourton, Oxon.—A freehold estate, 85 a. 3 r. 12 p. 5,000
Culworth, Northants.—A freehold estate, 65 a. 2 r. £2,250

By Messrs. COBB (at Sheerness).

Minster, Isle of Sheppey.—Hughes Meadow and two cottages, 6 a. 1 r. 3 p., f. 700
Borstal Hall Estate, 103 a. 1r. 6 p., f. 6,000
Borstal Lodge and 2 a. 2 r. 14 p., f. 670
High-street, freehold house and cottage 400
Spring Field, 3 a. 1 r. 5 p., f. 140
Four enclosures, 13 a. 3 r. 14 p., f. 680
Tadwell Farm, 118 a. 2 r. 28 p., f. 2,700
Freehold cottage and 1 a. 1 r. 9 p. 420
Various enclosures, 73 a. 1 r. 18 p., f. 2,050
Piece of garden ground, 0 a. 1 r. 6 p., f., with spring of water thereon 100

By THOMAS & BETTRIDGE (at Birmingham).

Beech Lanes, Staffs.—Three cottages and 3 a. 2 r. 29 p., f. 1,350
Tamworth, Warwick. — Monkspath Hill Farm, 101 a. 0 r. 37 p., f. 4,000
Solihull, Warwick.—The Moat Estate, 61 a. 1 r. 1 p., f. 4,300

June 20.—By BROWETT & TAYLOR.

Clerkenwell.—46, Clerkenwell-close, f., y.r. 40*l.* .. 645

By C. RAWLEY CROSS & CO.

Chiswick.—5, 7, 13, and 15, Benerley-rd, u.t. 88 yrs, g.r. 32*l.*, y.r. 165*l.* 1,815

By MOSS & JAMESON.

Battersea.—33, Milgrove-st., u.t. 71 yrs., g.r. 4*l.* 10s., w.r. 38*l.* 10s. 250

By F. H. B. RIDDLE & CO.

Lee.—Grove Pk., The Woodlands and 3¼ a., u.t. 70 yrs., g.r. 47*l.*, p. £1,040

By A. J. SHEFFIELD.

Ramsgate, Kent.—Margate-rd., Bromley House, f., y.r. 32*l.* 440
Stamford Hill.—21 and 43, Watcombe-villas, u.t. 74 yrs, g.r 10*l.* 10s, w.r. 62*l.* 8s. 360
Upton Park.—82 to 90 (even), Flashet-lane, u.t. 66 yrs., g.r. 20*l.*, w.r. 94*l.* 18s. 740
Silvertown.—132, Oriental-rd., u.t. 74½ yrs., g.r. 8*l.*, y.r. 42*l.* 990
Poplar.—246 to 260 (even), St. Leonard's-rd., u.t. 67 yrs., g.r. 31*l.* 5s., w.r. 217*l.* 2s. 1,370

By H. E. TRAFFORD & CARTER.

Tottenham.—2, Somerset-rd., f., w.r., 27*l.* 6s. .. 265
35, 37 and 39, Somerset-rd., f., w.r 80*l.* 14s. 915
7 to 16, Janson's-rd., f., w.r. 258*l.* 14s. 2,560
86 to 93 (even), Clyde-rd., f., w.r. 140*l.* 8s. 1,290
10, 18, 20, and 22, Grove-villas, u.t. 69 yrs., g.r. 18*l.*, w.r. 101*l.* 8s. 550
100 to 106 (even), Clyde-rd., u.t. 28 yrs., g.r. 5*l.*, w.r. 79*l.* 6s. 420
8 and 9, Kemble-rd., u.t. 82 yrs., g.r. 8*l.* 8s., w.r. 44*l.* 4s. 395
1, Liston-rd., u.t. 82 yrs., g.r. 4*l.* 4s., w.r. 23*l.* 8s. 180
51, Bruce Castle-rd., f., w.r. 31*l.* 4s. 275

By DOUGLAS YOUNG & CO.

Southwark.—10, Union-st. (warehouse), f., e.r. 85*l.* 1,050

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South Lambeth.—13, Lansdowne-gdns., u.t. 59 yrs., g.r. 6*l*., e.r. 44*l*..... £400

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e. for estimated rental; w.r. for weekly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 11 0	per 1,000 alongside, in river
Rough Stocks and Grizzles.....	1 9 0	,, ,, ,,
Facing Stocks	2 12 0	,, ,, ,,
Shippers	2 5 0	,, ,, ,,
Flettons	1 8 0	,, at railway depôt.
Red Wire Cuts ..	1 12 0	,, ,, ,,
Best Fareham Red	3 12 0	,, ,, ,,
Best Red Pressed Ruabon Facing.	5 5 0	,, ,, ,,
Best Blue Pressed Staffordshire ..	4 6 6	,, ,, ,,
Do., Bullnose	4 11 0	,, ,, ,,
Best Stourbridge Fire Bricks	4 6 0	,, ,, ,,

GLAZED BRICKS

Best White and Ivory Glazed Stretchers.....	13 0 0	,, ,, ,,
Headers	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	17 0 0	,, ,, ,,
Double Stretchers	19 0 0	,, ,, ,,
Double Headers..	16 0 0	,, ,, ,,
One Side and two Ends	19 0 0	,, ,, ,,
Two Sides and one End	20 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	20 0 0	,, ,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	,, ,, ,,
Quoins, Bullnose, and Flats	14 0 0	,, ,, ,,
Double Stretchers	15 0 0	,, ,, ,,
Double Headers..	14 0 0	,, ,, ,,
One Side and two Ends	15 0 0	,, ,, ,,
Two Sides and one End	15 0 0	,, ,, ,,
Splays, Chamfered, Squints.....	14 0 0	,, ,, ,,
Seconds Quality White and Dipped Salt Glazed....	2 0 0	less than best.

	s. d.	
Thames and Pit Sand	7 3	per yard, delivered.
Thames Ballast	6 0	,, ,,
Best Portland Cement	31 0	per ton, delivered.
Best Ground Blue Lias Lime..	25 0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime..... 10s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 26s. 6d. per ton at rly. dpt.

STONE.

	s. d.	
Ancaster in blocks	1 11	per ft. cube, deld. rly. depot
Bath ,, ...	1 7	,, ,,
Farleigh Down Bath ..	1 8	,, ,,
Beer in blocks	1 6	,, ,,
Grinshill ,, ...	1 10	,, ,,
Brown Portland in blocks	2 2	,, ,,
Darley Dale in blocks..	2 4	,, ,,
Red Corsehill ,,	2 5	,, ,,
Closeburn Red Freestone	2 3	,, ,,
Red Mansfield ,,	2 4	,, ,,
Hard York in blocks ..	2 10	,, ,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 8	per ft. super. at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	3 0	,, ,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,, ,,
,, ,, 2 in. self-faced Ditto	0 9½	,, ,,
Hopton Wood (Hard Bed) in blocks	2	3 per ft. cube. deld. rly. depôt
,, ,, ,, 6 in. sawn both sides landings	2	7 per ft. super. deld. rly. depôt.
,, ,, ,, 3 in. do.	1 2½	,, ,,

SLATES.

in. in.	£ s. d.	
20×10 best blue Bangor..	12 0	per 1000 of 1200 at ry. dep
,, best seconds ,,	11 10 0	,, ,,
16× 8 best ,,	6 17 6	,, ,,
20×10 best blue Portmadoc	11 7 6	,, ,,
16×8 best blue Portmadoc	6 5 0	,, ,,
20×10 best Eureka unfading green....	13 10 0	,, ,,
16× 8 ,, ,,	7 10 0	,, ,,
20×10 permanent green	10 10 0	,, ,,
16×8 ,, ,,	6 0 0	,, ,,

PRICES CURRENT (*Continued*).

TILES.

	s. d.	
Best plain red roofing tiles..	4£ 6	per 1,000, at rly. depôt.
Hip and valley tiles....	3 7	per doz. ,, ,,
Best Broseley tiles	4£ 6	per 1,000 ,, ,,
Hip and valley tiles....	4 0	per doz. ,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 ,, ,,
Do. ornamental Do.	60 0	,, ,, ,,
Hip tiles	4 0	per doz. ,, ,,
Valley tiles	3	,, ,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000 ,, ,,
Hip tiles	4 1	per doz. ,, ,,
Valley tiles.....	3 8	,, ,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	£ s. d.	£ s. d.
	At per standard.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.....	14 10 0	16 0 0
Deals: best 3 by 9.....	13 10 0	15 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.....	10 10 0	11 10 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds	0 10 0	,, ,, ,,
2 in. by 4 in. and 2 in. by 6 in. ..	8 10 0	9 10 0
2 in. by 4½ in. and 2 in by 5 in. ..	8 0 0	9 0 0
Foreign Sawn Boards— 1 in. by 12 in. by 12 in.	0 10 0	more than battens.
½ in.	1 0 0	,,
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0
Seconds	4 5 0	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	3 15 0
Swedish balks.....	2 15 0	3 0 0
itch-pine timber (30 ft.).....	3 0 0	3 10 0

JOINERS' WOOD.

	At per standard.	
White Sea: First yellow deals, 3 in. by 11 in.	22 0 0	23 0 0
3 in. by 9 in.	20 0 0	21 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0
Second yellow deals, 3 in. by 11 in.	18 0 0	20 0 0
,, ,, 3 in. by 9 in.	16 10 0	18 10 0
Battens, 2½ in. and 3 in. by 7 in.	13 0 0	14 0 0
Third yellow deals, 3 in. by 11 in. and 9 in.	14 0 0	15 10 0
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0
Petersburg: first yellow deals, 3 in. by 11 in.	20 0 0	21 0 0
Do. 3 in. by 9 in.	17 0 0	18 0 0
Battens.....	13 0 0	14 0 0
Second yellow deals, 3 in. by 11 in.....	15 0 0	16 10 0
Do. 3 in. by 9 in.	13 10 0	14 10 0
Battens.....	11 0 0	12 0 0
Third yellow deals, 3 in. by 11 in.....	12 10 0	13 10 0
Do. 3 in. by 9 in.	12 0 0	13 0 0
Battens.....	10 0 0	11 0 0
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 0 0	15 0 0
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0
Battens.....	11 0 0	12 0 0
Second white deals 3 in. by 11 in.	13 0 0	14 0 0
,, ,, ,, 3 in. by 9 in.	12 0 0	13 0 0
,, ,, ,, battens.....	9 10 0	10 10 0
Pitch-pine: deals	16 0 0	18 0 0
Under 2 in. thick extra	0 10 1	0 0 0
Yellow Pine—First, regular sizes..	32 0 0	33 10 0
Broads (12 in. and up).....	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—Planks, per ft. cube..	0 3 6	0 4 6
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 0
Small ,, ,, ...	0 2 3	0 2 6
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 5 6
Dry Wainscot Oak, per ft. sup. as inch	0 0 7½	0 0 8
½ in. do. do.	0 0 7	- - -
Dry Mahogany— Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks— Per ft. cube.....	0 3 0	0 3 6
Prepared Flooring—	Per square.	
1 in. by 7 in. yellow, planed and shot	0 13 0	0 16 6
1 in. by 7 in. yellow, planed and matched	0 13 6	0 17 6
1¼ in. by 7 in. yellow, planed and matched	0 15 0	1 0 0
1 in. by 7 in. white, planed and shot	0 11 0	0 12 6
1 in. by 7 in. white, planed and matched	0 11 6	0 13 6
1¼ in. by 7 in. white, planed and matched	0 13 6	0 15 6

6 in. at 6d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 2 6	7 2 6
Compound Girders ,, ,,	7 17 6	8 17 6
Angles, Tees and Channels, ordinary sections	7 17 6	8 17 6
Flitch Plates	8 5 0	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 0 0	8 0 0

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON—		
Common Bars.....	7 15 0	8 5 0
Staffordshire Crown Bars, good merchant quality	8 5 0	8 15 0
Staffordshire "Marked Bars" ..	10 10 0	- - -
Mild Steel Bars.....	9 0 0	9 10 0
Hoop Iron, basis price.....	9 5 0	9 10 0
,, ,, galvanised.....	16 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.— Ordinary sizes to 20 g.....	10 0 0	- - -
,, ,, to 24 g.....	12 0 0	- - -
,, ,, to 26 g.....	12 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.....	14 5 0	- - -
Sheet Iron, Galvanised, flat, best quality:— Ordinary sizes to 20 g.....	16 0 0	- - -
,, ,, 22 g. and 24 g.	16 10 0	- - -
,, ,, 26 g.....	18 0 0	- - -
Galvanised Corrugated Sheets.— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0	- - -
,, ,, 22 g. and 24 g.	13 5 0	- - -
,, ,, 26 g.	14 5 0	- - -
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker ..	12 0 0	- - -
,, ,, 22 g. and 24 g.	13 0 0	- - -
,, ,, 26 g.	14 5 0	- - -
Cut nails, 3 in. to 6 in.	9 5 0	9 15 0
(Under 3 in. usual trade extras.)		

LEAD, &c.

	Per ton in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. & up.	14 0 0	- - -
Pipe in coils	14 10 0	- - -
Soil Pipe.....	17 0 0	- - -
ZINC—Sheet— Vieille Montagne..... ton	24 0 0	- - -
Silesian	23 15 0	- - -
COPPER— Strong Sheet..... per lb	0 0 10	- - -
Thin ..... ,,	0 0 11	- - -
Copper nails..... ,,	0 0 11	- - -
BRASS— Strong Sheet..... ,,	0 0 10	- - -
Thin ,, ... ,,	0 0 10½	- - -
TIN—English Ingots..... ,,	0 1 5	- - -
SOLDER—Plumbers' ..... ,,	0 0 7	- - -
Tinmen's ..... ,,	0 0 9	- - -
Blowpipe ..... ,,	0 0 10½	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2d. ,, ,,
21 oz. thirds	3½d. ,, ,,
,, fourths.....	3d. ,, ,,
26 oz. thirds	4½d. ,, ,,
,, fourths	3½d. ,, ,,
32 oz. thirds	5½d. ,, ,,
,, fourths	4½d. ,, ,,
Fluted sheet, 15 oz.....	3d. ,, ,,
,, 21 ,, ...	4d. ,, ,,
½ Hartley's Rolled Plate	1½d. ,, ,,
⅝ ,, ,, ,, ...	2d. ,, ,,
¾ ,, ,, ,, ...	2½d. ,, ,,

OILS, &c.

	£ s. d.	
Raw Linseed Oil in pipes or barrels ..	per gallon	0 2 11
,, ,, ,, in drums	,,	0 3 2
Boiled ,, ,, in pipes or barrels ..	,,	0 3 1
,, ,, ,, in drums	,,	0 3 4
Turpentine, in barrels	,,	0 3 3
,, in drums	,,	0 3 5
Genuine Ground English White Lead	per ton	21 0 0
Red Lead, Dry	,,	20 0 0
Best Linseed Oil Putty	per cwt.	0 8 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Elastic Copal Varnish for outside work ..	0 16 0
Best Elastic Copal Varnish for outside work ..	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 0
Best Hard Oak Varnish for inside work.....	0 10 0
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work.....	0 16 0
Best Hard Copal Varnish for inside work.....	1 0 0
Best Hard Carriage Varnish for inside work....	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
Best French and Brush Polish	

TO CORRESPONDENTS.

W. B. (Amounts should have been stated).

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is given, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ANDOVER.—For the supply of surface picked flints, limestone, &c., for the Rural District Council. Mr. J. Wormald, District Surveyor, Andover:—

1,000 tons Hand Picked Surface Flint.

N. Besant, Ludgershall* £400 0 0

1000 tons Broken Somerset Limestone.

J. Wainwright & Co., Ltd., Shepton Mallet*.. 354 3 4

300 tons Broken Quartzite.

The Quartzite Co., Ltd., 29, Mark-lane, E.C.* 240 0 0

300 tons Broken Cornish Granite.

The St. Keverne Stone Co., Cornwall* 217 10 0

BELMONT (Durham).—For the erection of school buildings, for the trustees. Mr. H. T. Gradon, architect, 22, Market-place, Durham:—

Draper & Sons	£875 0 0	W. Walton	£780 0 0
T. Coates.....	857 0 0	C. W. Gibson ..	756 7 6
G. T. Manners	829 0 0	J. G. Bradley, Durham*	750 0 0
J. Shepherd....	815 0 0		
D. Hall	781 0 0		

BRIDGWATER (Somerset).—For the execution of sewerage works for the Town Council of Bridgwater. Mr. Francis Parr, C.E., Borough Surveyor, Municipal Buildings, Bridgwater. Quantities by Messrs. Samson & Cottam, High-street, Bridgwater:—

T. W. Pedrette	£4,680 0 0	J. Riley.....	£3,948 15 0
Wood	4,677 2 1	H. C. Parfitt ..	3 928 0 0
The Case Secure Defence Synd., Ltd..	3,983 4 2	C. Bryer, jun..	3,349 0 0
		Gleed Bros., Bridgwater*	3,350 0 0

BRISTOL.—For the conversion of two dwelling-houses into business premises. Mr. T. J. Moss-Flower, architect, 28, Baldwin-street, Bristol:—

Denby & Co.	£958	E. Preece.....	£628
J. Perkins.....	685	A. Waite, Easton*....	482
Walters & Son	681		

HOVE (Sussex).—For the execution of sewerage works, Osborne-street, &c., for the Corporation. Mr. H. H. Scott, Borough Surveyor, Town Hall, Hove. Quantities by Mr. S. Hunt, 129, Queen's-road, Brighton:—

J. & T. Binns	£2,037 5
Longley & Co.	2,000 0
Parsons & Sons, Hove*	1,869 0
Peerless, Dennis, & Co.	1,866 0

LITHERLAND (Lancs.).—For the execution of street works, Hartwell-street, &c., for the Urban District Council. Mr. A. H. Carter, Surveyor, 25, Sefton-road, Litherland:—

R. Chadwick	£2,133 13 1	Keating & Sons	£1,770 12 9
T. Rowlands	1,995 10 0	Owen & Co., Litherland*	1,120 1 9
Peter Tyson..	1,959 0 0		
J. Joynson ..	1,886 18 3		

KENDAL.—For the erection of two shops, &c., at Railway Hotel. Mr. J. Bintley, architect, 7, Lowther-street, Kendal. Quantities by the architect:—

Masonry, Walling, Excavating, Drains, and Slating.

R. & J. Dixons	£425 4 4	J. Hine	£360 14 4
Hill & Dixon ..	369 4 4	E. Hutton, jun.	345 4 4
Hine & Son.....	366 6 4	W. Thoms, Kendal*	332 12 4
Hutton & Son..	362 4 4		

Carpentry and Joinery.

Hayes & Parkinson	£404 2	J. Allen, Kendal*	£343 12
Park Bros.	377 2		

Plumbing.

W. Parsons	£71 8 0	W. Jackson	£68 8 6
J. P. Tanner	70 0 0	Airey & Co., Kendal*	60 0 0
E. Hubbard	69 10 0		

Painting and Glazing.

T. Wileman	£67 14 0	Airey & Co.	£52 0 0
W. Parsons	61 7 6	J. Wells	51 14 2
W. Jackson	59 8 6	Hine & Son	47 5 0
G. Lyon, Kendal*	53 10 0	J. P. Tanner	42 0 0

Slating.—Pickles, Leeds..... £76 0 0

Plastering.

Woodburn & Storey, Kendal*	£42 9 0
Steel & Co.	40 17 6

Plumbing, Painting, and Glazing.

W. Jackson	£127 17 0	J. P. Tanner....	£112 0 0

Total Tender for the whole of the Alterations.

Riddel, Southport..... £1,598 18 10

MERTHYR (Wales).—For the erection of forty-five cottages, for the Saxon Building Club, Merthyr Tydfil Mr. P. V. Jones, architect, Hengoed:—

Tate & Eastwood ..	£10,545	R. Lloyd, Merthyr Tydfil*	£8,426
Lloyd & Tape	8,940		
J. H. James.....	8,600		

School Board for London Tenders are unavoidably held over to next week.

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